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Environmental Compliance Assessment and Management Program (ECAMP)

Korea Supplement

The number of environmental laws and regulations continues to grow in the United States and worldwide, making compliance with regulations increasingly difficult. Environmental assessments became a way to evaluate compliance with current environmental regulations. The Air Force has adopted a compliance program that identifies problems before they are cited as violations by the U.S. Environmental Protection Agency (USEPA).

Beginning in 1984, the U.S. Army Construction Engineering Research Laboratories (USACERL), in cooperation with the Air Force Engineering and Services Center, began research on the Environmental Compliance Assessment and Management Program (ECAMP). The concept was to combine Federal, Department of Defense (DOD), and Air Force environmental regulations with good management practices and risk management issues into a series of checklists that show legal requirements and which specific items or operations to review. Each assessment protocol lists a point of contact to help assessors review the checklists as effectively as possible.

The Environmental Compliance Assessment and Management Program: Korea ECAMP is based on the Final Governing Standards for Korea, published by U.S. Forces-Korea in April 1995. Korea ECAMP includes pertinent information from Air Force instructions, DOD directives and instructions, and cited good management practices. The manual is updated continually to address new laws and regulations.

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The number of environmental laws and regulations continues to grow in the United States and worldwide, making compliance with regulations increasingly difficult. Environmental assessments became a way to evaluate compliance with current environmental regulations. The Air Force has adopted a compliance program that identifies problems before they are cited as violations by the U.S. Environmental Protection Agency (USEPA).

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FOREWORD

The research was performed for the Air Force Center for Environmental Excellence (AFCEE), under Military Interdepartmental Purchase Request (MIPR) number FQMSR95-0021, dated 27 February 1995. The AFCEE technical monitor was Ms. Nancy Carper, AFCEE/EP.

The research was performed by the Planning and Management Laboratory, Environmental Processes Division of the U.S. Army Construction Engineering Research Laboratories (USACERL). The Principal Investigator was Donna J. Schell, Environmental Processes Division (PL-N); Dr. David A. Krooks, Environmental Processes Division (PL-N), was Associate Investigator. Dr. Krooks's research was administered in part by an appointment to the Research Participation Program at USACERL administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and USACERL. Mr. L. Jerome Benson is Acting Division Chief (PL-N), and Dr. David Joncich is Acting Laboratory Chief (PL).

COL James T. Scott is Commander, USACERL. Dr. Michael J. O'Connor is Director.

NOTICE

This manual is intended as general guidance for personnel at Air Force (AF) 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

This manual provides the Environmental Compliance Assessment and Management Program (ECAMP) assessment checklists to be used during an ECAMP assessment. These environmental assessment checklists are based on the *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995. This manual serves as the primary tool in conducting the environmental compliance assessment phase of the ECAMP process. Specifically, this manual:

1. compiles applicable Department of Defense (DOD) and AF environmental regulations and instructions with AF operations and activities
2. synthesizes environmental regulations, management practices (MPs), and risk management issues into consistent and easy to use checklists
3. serves as an aid in the assessment process and the management action development phases of the ECAMP.

This manual is divided into 13 sections. General ECAMP guidance and information applicable to all 13 compliance assessment checklists in the ECAMP manual can be found in the Main Introduction. Sections 1 through 13 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.

This manual contains references to existing Air Force Regulations (AFRs), Air Force Policy Directives (AFPDs), Air Force Manuals (AFMs), and Air Force Pamphlets (AFPs). The AF is in the process of replacing AFRs with Air Force Instructions (AFIs). This ECAMP manual contains references to a combination of the above. References to AFRs will be replaced with applicable citations in the next version of the manual. HQ USAF/CEV will issue interim guidance as the new policies and regulations are approved.

The AFIs included in the manual are up-to-date through Air Force Index 2, *Numerical Index of Standard and Recurring Air Force Publications*, 19 January 1996 (for the period ending 29 December 1995).

PROGRAM BACKGROUND

The ECAMP is explained in AFI 32-7045, *Environmental Compliance Assessment and Management Program* (ECAMP). The primary objectives of ECAMP are:

1. improve AF environmental management
2. improve AF environmental compliance and compliance management
3. build supporting financial programs and budgets for environmental compliance requirements
4. ensure that Major Commands (MAJCOMs) are effectively addressing past, present, and future environmental concerns.

AF installations, support sites, and government-owned contractor-operated (GOCO) facilities are required to receive an external environmental compliance assessment at least once every 3 yr. Each installation and support site must conduct an internal assessment each calendar year, except in years when external assessments are conducted.

Facilities can be exempted from the ECAMP if their inclusion in the program will significantly interfere with their military effectiveness or if it is otherwise in the national interest. Approval authority for such exemptions is the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health (SAF/MIQ). The MAJCOM Environmental Protection Committee (EPC) will prepare requests for exemption and forward to HQ USAF/CEV for action.

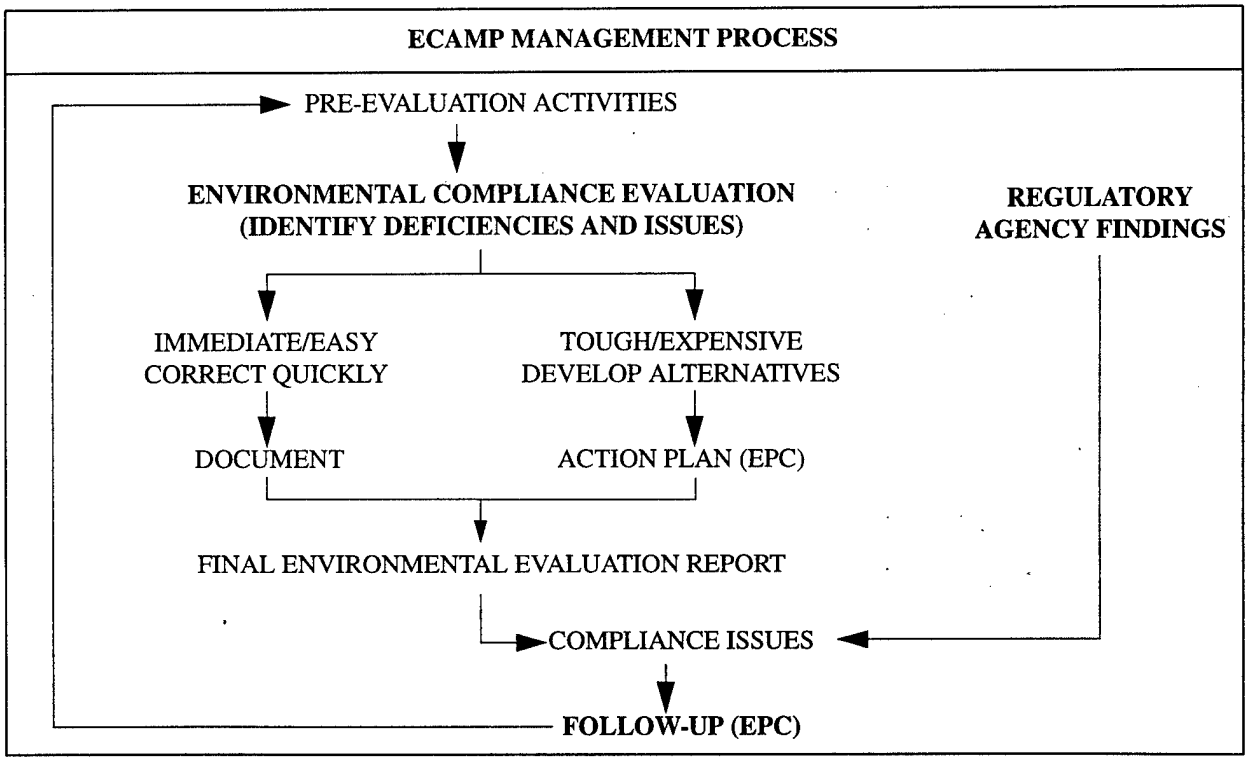
ECAMP PROGRAM MANAGEMENT PROCESS

The ECAMP program management process begins with the environmental compliance assessment and written report that identifies compliance and management issues. The commander, through the EPC, then assigns appropriate staff agencies to work each issue.

ECAMP Action Summary - The path illustrated on the far left of the flowchart represents the process the installation follows in resolving most issues. Immediate hazards should, of course, be addressed as quickly as possible. The procedural, easy-to-fix issues, are corrected during the assessment process and documented in the report.

The path in the center, for the tough and expensive issues, includes preparing a management action plan describing how these problems will be addressed.

Formal notices of noncompliance issued by regulatory agencies are represented by the path on the far right. Open notices of noncompliance at the time of the assessment are included in the ECAMP assessment and report. Notices of noncompliance issued after the date of the ECAMP assessment do not appear in the report, but are managed by the installation EPC along with ECAMP issues.



ECAMP ABROAD

AFI 32-7006, *Environmental Program in Foreign Countries*, 29 April 1994, details the objectives, background, and standards unique to AF environmental activities in foreign countries. It requires that installations comply with the DOD Final Governing Standards (FGSs) issued for the particular host country where each installation is located.

The Instruction acknowledges, however, that FGS have not yet been issued for all countries in which the AF has installations. In instances where the FGS have not been completed, installations must comply with the requirements of the *Overseas Environmental Baseline Guidance Document* (OEBGD), but only after ensuring that the criteria in it do not conflict with any applicable international agreements such as treaties, status of forces agreements (SOFAs), or bilateral agreements. This manual is based on FGS-ROK, April 1995.

Those few installations and facilities located in foreign countries for which environmental executive agents (EEAs) have not been assigned to prepare the FGS must comply with the criteria in the OEBGD, but only after ensuring that the criteria in it do not conflict with any applicable international agreements such as treaties, SOFAs, or bilateral agreements. The Worldwide ECAMP manual is used in these cases as well. When an EEA is assigned and the FGS prepared, the FGS will supersede the use of the OEBGD.

As the sole compliance standards at installations and facilities in foreign countries, the FGS (or the OEBGD under the conditions discussed above) takes precedence over compliance with AF environmental instructions specified as not required in Attachment 2 to AFI 32-7006. Compliance with instructions so designated in the Attachment is not required. Compliance with the AFIs specified as "required" is mandatory, but only after ensuring that their requirements do not conflict with the provisions of the FGS (or the OEBGD) or with any applicable international agreements such as treaties, status of forces agreements (SOFAs), or bilateral agreements. The following AFIs specified as "required" in AFI 32-7006 are included in this manual:

32-7001 - *Environmental Budgeting*
32-7002 - *Environmental Information Management System*
32-7005 - *Environmental Protection Committees*
32-7045 - *Environmental Compliance Assessment and Management Program*
32-7061 - *Environmental Impact Analysis Process*
32-7080 - *Pollution Prevention Programs*
48-119 - *Instructions for Medical Service Environmental Pollution Monitoring.*

The ECAMP manual includes in its scope certain AFIs in addition to those listed above, and in the course of a compliance assessment findings may be written on the basis of those other AFIs. It should be noted that **only those requirements that are based on FGS-ROK and/or on AFIs specified as required are eligible for funding with environmental compliance monies.** It may be necessary for installations to seek funding from other sources in order to close findings written on the basis of AFIs other than those that are specified as required in AFI 32-7006.

ENVIRONMENTAL COMPLIANCE ASSESSMENT PROCESS

The ECAMP program management process described previously can be divided into three distinct phases:

1. pre-assessment activities
2. site assessment activities
3. post-assessment activities.

Pre-assessment Activities - There are five key activities that should be completed before an assessment team begins the site assessment.

1. Previsit Questionnaire - The purpose of the previsit questionnaire is to collect information that will familiarize the assessment team with the installation and its operations so that its assessment team is able to review the applicable regulations and prepare a detailed assessment schedule. The previsit questionnaire is essential as part of the pre-assessment activities for an external assessment. It is also an excellent tool for ensuring internal assessment team members are starting from the same base of information. Table 1 (see page xlv) contains a sample previsit questionnaire.

2. Define Assessment Scope and Team Responsibilities - The installation or MAJCOM may wish to place special emphasis on certain compliance categories or to review additional areas not covered in the volumes. These goals should be clearly stated so the assessment can be properly planned. Additionally, the duration of the assessment, appointment of team members by the EPC, and handling of tenants and offbase sites should be addressed. Typical teams include members from personnel, and may include: Environmental Coordinator (EC), Bioenvironmental Engineering (BEE), Judge Advocate (JA), Ground Supply Officer, Supply, Maintenance, Transportation, Defense Reutilization and Marketing Office (DRMO), Base Civil Engineer (BCE) Water and Waste Superintendent, BCE (Contract Management), BCE (Natural Resources Manager), BCE (Fire Department), BCE (Engineering Design); or, if contracted, people with equivalent varied experience may be chosen. Assessors should possess a good working knowledge of the various environmental pollution statutes and regulations. Collectively, the team must have the knowledge and background required to conduct all aspects of an installation assessment efficiently and effectively. Team members should also understand appropriate techniques for collecting information and interviewing installation personnel. Team members should have received formal training or received oversight from someone who has received formal training. Finally, responsibilities for each of the checklists should be assigned to the team members as appropriate.

   Table 2 (see page lxi) lists the major environmental operations and activities at typical AF installations and the sections within which they are addressed. As shown, many activities and operations cause environmental impacts in more than one area, and are, therefore, addressed in more than one section.

3. Review Relevant Regulations - Once the assessment scope and responsibilities are known, the assessors should undertake a thorough review of the regulations relevant to the installation. Which environmental regulations are applicable must be determined before the assessment begins.

4. Develop Assessment Schedule - The team should develop a detailed assessment schedule that includes the activities planned for each day.

5. Review Assessment Protocols - Each assessor should know the regulatory requirements and be familiar with the assessment checklists that will be used.

Site Assessment Activities - Onsite, the assessors will conduct record searches, interviews, and site surveys to determine the compliance status of the installation. Operations are compared with environmental standards and any deficiencies are written up as findings. The data collected should be sufficient, reliable, and relevant to provide a sound basis for assessment findings and recommendations. Figure 1 (see page xv), the ECAMP Finding Form, is available to assist assessors in compiling needed information during an ECAMP assessment. A Finding Form should be completed for each finding during the assessment. These forms comprise the basis of the ECAMP report. Figure 1 is based on the future version of the finding screen layout on the Work Information Management System - Environmental Subsystem (WIMS-ES).

On the following pages, the reader will find an ECAMP Finding Form, an explanation of the fields it contains, and an example ECAMP Finding Form that has been properly filled out.

(**NOTE**: Any findings discovered through the use of this guidance manual by the internal assessment should be validated by the environmental coordinator and Judge Advocate. The findings and corrective actions should be recorded in the EPC minutes.)

Post-Assessment Activities. The first step in the post-assessment activities is the creation of the draft report. The MAJCOM EPC will ensure that each installation reviews and comments on the Preliminary Environmental Findings, develops a management action plan that addresses all unresolved findings; and tracks each significant, major, and minor noncompliance finding. The MAJCOM EPC will coordinate the development of a management action plan, the Draft Final Environmental Compliance Assessment Report, and the Final Environmental Compliance Assessment Report within 120 days of the site assessment. Upon approval, the MAJCOM will forward the final report to HQ USAF/CEV and the Air Force Center for Environmental Excellence (AFCEE)/EP via the WIMS-ES.

Figure 1

ECAMP Finding Form

Date of Finding _____ Protocol _____ Finding # _____ - _____

Rating _____ Repeat Finding? _____ Est Comp Date _____

Act Comp Date _____

Street Address _____

Grid Coordinates _____

Facility # _____ Location _____

Finding Title _____

Details

Figure 1 (continued)

ECAMP Finding Form

Question Number _____ A-106 Media _____

Responsible Organization _____ Org Type _____

_____ _____

_____ _____

_____ _____

CFR Citation _____

Other Criteria _____

_____

_____

Root Cause _____ Explain _____

_____

_____

_____

Violation Type _____ _____ _____ Finding ID _____ _____ _____ Finding Type _____ Source _____

Owning Org POC _____ Off Sym _____ Phone _____ Ext _____

Env Mgt Org POC _____ Off Sym _____ Phone _____ Ext _____

Suggested Solution _____

_____

_____

_____

_____

_____

_____

_____

A-106 Proj # _____ Est Cost $ _____

Definitions for ECAMP Finding Form

(NOTE: The following fields, which are included on the ECAMP Finding Form are not in the current version of the software, but this form can be used to assist with data entry in the current version: Repeat Finding; Grid Coordinates; Street Address; Organization Type; Code of Federal Regulations (CFR) Citation; Other Criteria; Root Cause; additional two entries for Violation Type; additional two entries for Finding Identification (ID); Suggested Solution.)

1. **Date of Finding**: Enter the date the finding was discovered. This is the exact date the finding was discovered. Try to avoid using the same date for all findings. YYYY MM DD (Convert "Finding Date").

2. **Protocol**: Using the selector, choose the protocol for the finding.

   Air
   Hazardous Materials
   Hazardous Waste
   Nat/Cul Resources
   Noise
   Pesticide
   Petroleum, Oil, and Lubricant (POL)
   Solid Waste
   Special Programs (Polychlorinated Biphenyls (PCBs), Asbestos, Radon Mitigation, Installation Restoration Program (IRP), A-106 Pollution Abatement Plan, Environmental Impact Analysis Process (EIAP), Work Information Management System-Environmental Subsystem (WIMS-ES), and Lead-based Paint (LBP))
   Water Quality
   Pollution Prevention

3. **Finding Number**: This field indicates the placement of this finding in the report. It may have nothing to do with its priority or status, depending on the philosophy of the program manager. Each protocol has its own set of numbers. In other words, you can have a HW-001 and an AIR-001.

4. **Rating**:
   Significant
   Major
   Minor
   Management Practice
   Positive

5. **Repeat?**: Identify with a "Y" if this finding is a repeat finding. Has there been a finding documented in a prior ECAMP identical to this finding? If not, enter "N".

6. **Estimated Compliance Date (ECD)**: What is the YYYY MM DD that this finding will be brought into compliance?

7. **Actual Compliance:** If the finding is brought into compliance during the evaluation, enter that date.

8. At least one of the following three must be completed. If more information is known, it should be entered.

    a. **Street Address**: Enter the street/mailing address for the location of this finding.

    b. **Grid Coord**: Enter the grid coordinated for the location of the finding. This is optional.

    c. **Facility Number**: Enter the facility number for the location of the finding.

9. **Location Description**: Use this field if facility number or street address is not applicable. Briefly describe the location of the finding.

10. **Finding Title**: Enter a brief, descriptive title for the finding (up to 51 characters).

11. **Details**: Enter a detailed description of the finding. State what is wrong, how the process or procedures are being done now, and how long is has been under way. State exactly how the AF is out of compliance. Be concise, objective, and strictly factual. Do not be subjective. Do not make inflammatory remarks (up to 726 characters).

12. **Question #**: This is the question number from the ECAMP manual. The first three characters are entered automatically by the system. Enter the question number from the manual (enter the main paragraph number only, no periods or dashes required).

13. **A-106 Media**: Choose the A-106 media that best matches the finding condition.

AT	Atomic Energy
CA	*Clean Air Act*
CW	*Clean Water Act*
ES	*Endangered Species Act*
FF	*Federal Insecticide/Fungicide/Rodenticide Act*
HP	Historic Preservation
MU	Multi-Media
NC	Noise Control
NE	*National Environment Policy Act*
RC	*Resources Conservation and Recovery Act*
SD	*Safe Drinking Water Act*
SF	*Comprehensive Environmental Response, Compensation, and Liability Act*
TS	*Toxic Substance Control Act*

14. **Responsible Organization**: Enter the organizations that "caused" the finding. You can enter up to three organizations. This is the "who done it" data field that can be used for trend analysis to find organizations that need additional training, equipment, manpower, etc.

15. **Organization Type**: For each organization, identify the appropriate type code.

Academic	Academic
AC Maint	Aircraft maintenance
AC Clean	Cleaning/degreasing aircraft parts
AC Storage	Aircraft storage, ramp, parking, etc.
AC Wash	Aircraft washrack

AGE Repair	Aerospace ground equipment (AGE) storage and/or repair
Alert	Transient alert
Arts	Arts and crafts
Auto Body	Auto hobby
Audio	Audiovisual services
Avionics	Aircraft avionics maintenance
Base Svc	Base service station
Bio	Bioenvironmental Engineering
Bulk Fuels	Bulk fuels management
BX	Base exchange
Childcare	Childcare center
Clean/Deg	Cleaning and degreasing (not aircraft)
CE Maint	Civil Engineering maintenance shop
CE Mat	Civil Engineering material control
CE Self	Civil Engineering self-help store
Cmmssry	Commissary
Comm Maint	Communications maintenance
Dental	Dental clinic
DRMO	DRMO treatment, storage, and disposal facility (TSDF)
Elect/Env	Electro/environmental
Entomology	Entomology shop
EOD	Explosive ordinance disposal
Env Mgt	Environmental management
Fire Dept	Fire department
Golf	Golf course
Heat Plnt	Heat plant
Hvy Equip	Heavy equipment maintenance/storage
Hospital	Hospital/clinic
Housing	Housing maintenance
Hyd/Pneu	Hydraulics/Pneudraulics
IWTP	Industrial wastewater treatment plant
Landfill	Landfill
Off Bldg	Business offices (Consolidated Base Personnel Office(CBPO),banks,etc.)
Other	Other, any other not listed
Rsrch Lab	Research laboratory
Supply	Base supply
Swim	Swimming pool
Test Cell	Engine test cell
TSD	Base TSDF
Veh Maint	Vehicle maintenance/storage
Veh Wash	Vehicle washrack
Vet Clinic	Veterinary clinic
WWTP	Wastewater treatment plant

16. **CFR Citation**: Enter the CFR citation for the finding.

17. **Other Criteria**: Enter all the laws, regulations, statutes, etc., other than the CFR citation, defining th out-of-compliance condition. You may also enter a brief description of that criterion (u to 192 characters).

18. **Root Cause**: Select the root cause that best reflects the basic reason for the out of compliance condition.

Materials:

M1 Supply
M2 Poor Quality

Personnel:

P1 Awareness of Requirement
P2 Understanding
P3 Not conscientious (deals with attitude of personnel)
P4 Result vs. Action (The result did not equal the action taken. Procedures were followed which should have produced a favorable result but did not.)
P5 Accountability not assigned
P6 Action vs. Procedure (correct procedure(s) in place but incorrect action taken)
P7 Insufficient skills
P8 Inexperience (not an attitude of personnel)

Equipment:

E1 Controls failure
E2 Inadequate facility design
E3 Monitoring equipment failure
E4 Poor maintenance

Techniques:

T1 Time to do the job
T2 No procedures in place
T3 Priority conflict
T4 Inadequate Procedures
T5 Procedures not available

19. Explain the reason for your selection of Root Cause. Be specific and stick to the facts (up to 119 characters).

20. **Violation Type**: Choose the appropriate code(s) that best describe(s) the situation. You can enter up to three.

Administrative

A1 Records
A2 Labels
A3 Reports
A4 Manifests
A5 Lack of a permit
A6 Inadequate/missing plan
A7 Public notification
A8 Operator certification
A9 Fire standard
A10 Program planning
A11 Sampling
A12 training
A13 Other
A14 Registration
A15 Uncharacterized
A16 Lacking or incomplete inventory/survey

Potential Discharge

P1 Operational practices
P2 Inadequate facility
P3 Inadequate equipment/containers
P4 Other
P5 No testing/verification
P6 Containment

Discharge

D1 Excess chemical parameter
D2 Excess physical parameter
D3 Groundwater contamination
D4 Spills/leaks
D5 Other

21. **Finding Category Codes**: Choose the appropriate code(s). You can enter up to three.

Air Emissions Management
- 1A Fuel Burners
- 1B Incinerators
- 1C Volatile Organics
- 1D Others
- 1E Ozone Depl Chems
- 1F Particulates/Bead Blast
- 1G Air Toxics, Metals
- 1H General Requirements

Hazardous Material Management
- 2A Storage Structures
- 2B Operations/Management
- 2C Others

Hazardous Waste Management
- 3A Accumulation Points
- 3B TSDFs
- 3C Training
- 3D Waste Minimization
- 3E Others
- 3F Oil/Water Separators
- 3G Satellite Accum Points
- 3H Operational Procedures

Natural/Cultural Resources Management
- 4A Wildlife/Recreation/Forestry
- 4B Cultural/Historic
- 4C Land/Agriculture
- 4D Wetlands/Floodplains
- 4E Others

Environmental Noise Management
- 5A Installation compatible use zone (ICUZ)
- 5B Procedures
- 5C Others

Pesticide Management
- 6A Facilities/Equipment
- 6B Operations/Mgt
- 6C Others

Petroleum, Oil, and Lubricant (POL) Mgt
- 7A Above Ground Tanks
- 7B Underground Tanks
- 7C Operations/Mgt
- 7D Others
- 7E Oil/Water Separators
- 7F Drum Storage

Solid Waste Management
- 8A Landfills
- 8B Receptacles
- 8C Recycling
- 8D Others
- 8E Medical Waste
- 8F Regulated Materials

Special Programs Management
- 9A PCBs
- 9B Asbestos
- 9C Radon Mitigation
- 9D Others
- 9E IRP
- 9F EIAP
- 9G A-106
- 9H ECAMP
- 9I Lead-Based Paint (LBP)
- 9J Low Level Radiation
- 9K Automation Issues

Water Quality Management
- 10A Sanitary Wastewater
- 10B Industrial Wastewater
- 10C Stormwater Runoff
- 10D Nonpoint Runoff
- 10E Operations
- 10F Others
- 10G Facilities/Equipment
- 10H Oil/Water Separators
- 10I Drinking Water

Pollution Prevention Management
- 11A Management Plans
- 11B Ozone depleting chemicals (ODCs)
- 11C EPA 17
- 11D Hazardous Waste Minimization
- 11E Recycling
- 11F Affirmative Procurement
- 11G Energy Conservation
- 11H Education and Training
- 11I Hazardous Material Control
- 11J Other

22. **Finding Type**: Choose the appropriate code.

23. **Source**: Choose the appropriate source for the definition of the noncompliance.

    U.S. Protocols
    Worldwide Manual/Overseas Manual
    Installation Supplement to ECAMP Manual
    Command Supplement to ECAMP Manual
    Country Manual
    Country Supplement
    State Supplement
    Local Law/Ordinance

24. **Owning Organization Point of Contact (POC)**: Enter the name of the POC of the organization handling the fix.

25. **Office Symbol**: Enter the office symbol for the POC.

26. **Phone and Extension**: Enter the phone and extension for the POC.

27. **Environmental Management POC**: Enter the name of the POC within the Environmental Management Office (EMO) who is responsible for tracking this finding.

28. **Office Symbol**: Enter the office symbol for the POC.

29. **Phone and Extension**: Enter the phone and extension for the POC.

30. **Evaluator's Suggested Solution**: Enter the suggested solution for the evaluator. After validation, this is nonmodifiable (up to 308 characters).

31. **A-106 Project #**: If there is funding already programmed for the fix, enter the A-106 project number if available.

32. **Estimated Cost**: If the information is available, enter the estimated cost of the project.

Sample ECAMP Finding Form

Date of Finding _____ Protocol _____ Finding # _____-_____

Rating _____ Repeat Finding? _____ Est Comp Date _____

Act Comp Date _____

Street Address _____

Grid Coordinates _____

Facility # _____ Location _____

Finding Title _____

Details

Sample ECAMP Finding Form (continued)

Question Number _____ A-106 Media _____

Responsible Organization _____ Org Type _____

_____ _____

_____ _____

_____ _____

CFR Citation _____

Other Criteria _____

_____

_____

Root Cause _____ Explain _____

_____

_____

_____

Violation Type _____ _____ _____ Finding ID _____ _____ _____ Finding Type _____ Source _____

Owning Org POC _____ Off Sym _____ Phone _____ Ext _____

Env Mgt Org POC _____ Off Sym _____ Phone _____ Ext _____

Suggested Solution _____

_____

_____

_____

_____

_____

_____

_____

A-106 Proj # _____ Est Cost $ _____

USING THE ECAMP MANUAL

AF installations engage in many operations and activities that can cause environmental impacts on public health and the environment if not controlled or properly managed. Many of these activities and operations are regulated by FGS-ROK and by AFRs/policies. After a review of these activities at AF installations, it is apparent that there are major categories of environmental compliance into which most environmental regulations and agency activities can be grouped. This manual is divided into 13 sections that correspond to major compliance categories:

1. Air Emissions Management
2. Cultural Resources Management
3. Hazardous Materials Management
4. Hazardous Waste Management
5. Natural Resources Management
6. Other Environmental Issues
7. Pesticide Management
8. Petroleum, Oil, and Lubricant (POL) Management
9. Solid Waste Management
10. Storage Tank Management
11. Toxic Substances Management
12. Wastewater Management
13. Water Quality Management

Each section is organized in the following format:

A. **Applicability of this Protocol**. This provides guidance on the major activities and operations included in the section and a brief description of the major application.

B. **Department of Defense (DOD) Directives and Instructions.** This identifies DOD Directives and Instructions that have not yet been implemented by an AFR or AFI.

C. **Air Force Documents.** This identifies, in summary form, the key AFRs, AFIs, and AFPDs that mandate requirements in the compliance category.

D. **Responsibility for Compliance**. This identifies the personnel on the installation who have compliance responsibilities for the compliance category.

E. **Definitions.** This presents definitions taken from FGS-ROK and pertinent AFRs and AFIs for those key terms associated with each compliance category.

F. **Compliance Assessment Checklists.** The final portion of each section is a checklist composed of requirements or guidelines that serve as indicators to point out possible compliance problems and practices, conditions, or situations that could indicate potential problems. The checklist is intended to focus attention on the key compliance issues. Instructions are provided to direct the assessor to the action, references, or activity appropriate to the specific requirement or guideline.

USING THE CHECKLISTS

Understanding the layout and structure of the checklists facilitates their use during the assessment.

- **Explanation of Layout/Content**. The checklist portion of assessment section is divided into two columns. The first of these is a statement of a requirement. This may be a strict regulatory requirement, in which case the citation is given, or it may be a requirement that is considered to be a good management practice to maintain compliance, but which is not specifically mandated by regulation. The second column gives instructions to help conduct the compliance assessment. These instructions are intended to be specific action items that should be accomplished by the investigator. Some of the instructions may be a simple documentation check taking a few minutes; others may require physical inspection of a facility.

- **Worksheet.** At the end of each section there is an assessment worksheet. This worksheet should be reproduced and used during the assessment to take notes. It is designed to be inserted between each page of the checklists, allowing the main text to be kept usable for the next assessment. The worksheet is divided into two columns. The first column is a quick check for those items that are in compliance (C), not applicable (N/A) to the facility being reviewed, or require management action (RMA). The second column on the worksheet allows for more detailed notations or comments. These notations will provide a record for use in preparing the final report. These notations should include both situations of substandard operation needing attention and those operations that are above requirements or provide examples of good programs. For future reference and clarity, it is essential that the building number be recorded or that some other reference to location be made during the review.

- **Standard Checklist Items**. The first three checklist items in each section of the manual are standardized. The first item requires a review of any previous assessment documents. The second is a management practice that indicates the AF documents that the installation should have on hand. The third item provides a place for assessors to write up findings that are based on regulations that have been promulgated since the publication of the manual or regulations not included in the manual.

The assessment procedures are designed as an aid and should not be considered exhaustive. Use of the checklist requires the assessor's judgment to play a role in determining the focus and extent of further investigation.

CUSTOMIZING THE CHECKLISTS FOR YOUR INSTALLATION

Creating Shop-Specific and Self-Inspection Checklists - The ECAMP checklists in this manual are a useful tool for creating self-inspection checklists for individual shops. These shop-specific checklists can be used by shop supervisors and workers to ensure correct practices and procedures are being followed on a routine basis. Thus, good self-inspection checklists are an excellent supplement to annual ECAMP assessments. A customized checklist can be created in five steps:

1. Review the shop's activities to determine which sections apply.
2. Select broad portions of the applicable sections for closer review by using the guidance page found before the checklist in each section.
3. Review the individual checklist items selected for application to the shop being assessed.
4. Edit the applicable checklist items to make them shop-specific.
5. Compile the checklist items.

WRITING THE ECAMP REPORT

All ECAMP documents prepared prior to the Final Environmental Evaluation Report are internal working documents until the time that the Final Environmental Report is executed. They will be marked FOR OFFICIAL USE ONLY and handled accordingly. The AF has determined that their premature release would jeopardize the AF's interest in preserving the free flow, analysis, and comment on internal information regarding environmental compliance. Therefore, except as otherwise required by law, ECAMP documents will not be released to the public sector prior to the execution of the Final Environmental Evaluation Report. As a matter of policy, the Final Environmental Evaluation Report will be made available for release to the public, upon request, as soon as it is executed.

Final assessment reports will consist of five chapters and subheadings for each chapter as follows:

Chapter 1.0 Executive Summary

- 1.1 Background
- 1.2 Summary of Findings

Chapter 2.0 Background and Scope

- 2.1 Background
- 2.2 Scope

Chapter 3.0 Environmental Compliance Status

- 3.1 Air Emissions Management
- 3.2 Cultural Resources Management
- 3.3 Hazardous Materials Management
- 3.4 Hazardous Waste Management
- 3.5 Natural Resources Management
- 3.6 Other Environmental Issues
- 3.7 Pesticide Management
- 3.8 Petroleum, Oil, and Lubricant (POL) Management
- 3.9 Solid Waste Management
- 3.10 Storage Tank Management
- 3.11 Toxic Substances Management
- 3.12 Wastewater Management
- 3.13 Water Quality Management

Chapter 4.0 Environmental Practices Issues

- 4.1 Air Emissions Management
- 4.2 Cultural Resources Management
- 4.3 Hazardous Materials Management
- 4.4 Hazardous Waste Management
- 4.5 Natural Resources Management
- 4.6 Other Environmental Issues
- 4.7 Pesticide Management
- 4.8 Petroleum, Oil, and Lubricant (POL) Management
- 4.9 Solid Waste Management

4.10 Storage Tank Management
4.11 Toxic Substances Management
4.12 Wastewater Management
4.13 Water Quality Management

Chapter 5.0 Management Plan

5.1 Corrected Environmental Compliance Findings
5.2 Open Environmental Compliance Findings
5.3 Closed Environmental Practice Issues
5.4 Open Environmental Practice Issues

Each chapter of the assessment report should follow the described format:

Chapter 1.0. Executive Summary - The executive summary should contain background information and a summary of findings as follows:

1. Background
   a. date and location of the assessment and identification of the assessment team
   b. overall assessment purpose.
2. Summary of Findings
   a. narrative summary of compliance status by section and major environmental issues. To provide balanced tone, consider placing positive comments first, followed by a summary of negative comments, if applicable
   b. the Environmental Compliance Summary (see Figure 2 for format, page xxxv)
   c. the Detailed Environmental Compliance Status (see Figure 3, page xxxvii)
   d. the Environmental Compliance Status (see Figure 4, page xli), which is a summary of findings by violation type.

Figure 2

Environmental Compliance Summary

Compliance Area	Summary Sig	Major	Minor	TOTAL
1. Air Emissions Management				
2. Cultural Resources Management				
3. Hazardous Materials Management				
4. Hazardous Waste Management				
5. Natural Resources Management				
6. Other Environmental Issues				
7. Pesticide Management				
8. POL Management				
9. Solid Management				
10. Storage Tank Management				
11. Toxic Substances Management				
12. Wastewater Management				
13. Water Quality Management				
TOTAL				

Figure 3

Detailed Environmental Compliance Status

	FINDINGS			
Compliance Area	**Sig**	**Major**	**Minor**	**TOTAL**
Air Emissions Management				
Fuel Burners	____	____	____	_____
Incinerators	____	____	____	_____
Volatile Organics	____	____	____	_____
Vehicle Emissions	____	____	____	____
Ozone Depleting Chemicals	____	____	____	____
Particulates, Bead Blast	____	____	____	____
Air Toxic Metals	____	____	____	____
General Requirements	____	____	____	_____
TOTAL	____	____	____	____
Cultural Resources Management				
Cultural/Historic	____	____	____	_____
TOTAL	____	____	____	____
Hazardous Materials Management				
Storage Structures	____	____	____	_____
Operations/Management	____	____	____	_____
TOTAL	____	____	____	_____
Hazardous Waste Management				
Accumulation Points	____	____	____	_____
TSD Facilities	____	____	____	_____
Training	____	____	____	_____
Waste Minimization	____	____	____	_____
Oil/Water Separators	____	____	____	_____
Satellite Accumulation Points	____	____	____	____
Operational Procedures	____	____	____	____
TOTAL	____	____	____	____

(continued)

Figure 3 (continued)

Detailed Environmental Compliance Status

Compliance Area	FINDINGS Sig	Major	Minor	TOTAL
Natural Resources Management				
Wilderness/Recreation/Forestry	____	____	____	_____
Land/Agriculture	____	____	____	_____
Wetlands/Floodplains	____	____	____	_____
TOTAL	____	____	____	_____
Other Environmental Issues				
EIAP	____	____	____	_____
Environmental Noise Management				
ICUZ	____	____	____	_____
Procedures	____	____	____	_____
Management	____	____	____	_____
IRP	____	____	____	_____
Pollution Prevention Management				
Management Plans	____	____	____	____
ODCs	____	____	____	____
EPA 17	____	____	____	____
Hazardous Waste Minimization	____	____	____	____
Recycling	____	____	____	____
Affirmative Procurement	____	____	____	____
Energy Conservation	____	____	____	____
Education and Training	____	____	____	____
Hazardous Material Control	____	____	____	____
Program Management				
A-106	____	____	____	_____
ECAMP (Preparation/ Conduct)	____	____	____	_____
TOTAL	____	____	____	____
Pesticide Management				
Facilities/Equipment	____	____	____	_____
Operations/Management	____	____	____	_____
TOTAL	____	____	____	_____

(continued)

Figure 3 (continued)

Detailed Environmental Compliance Status

Compliance Area	FINDINGS Sig	Major	Minor	TOTAL
Petroleum, Oil, and Lubricant (POL) Management				
Operations/Management	____	____	____	____
Loading/Unloading Racks	____	____	____	____
Oil/Water Separators	____	____	____	____
Drum Storage	____	____	____	____
Hydrant System	____	____	____	____
TOTAL	____	____	____	____
Solid Waste Management				
Landfills	____	____	____	____
Receptacles	____	____	____	____
Recycling	____	____	____	____
Medical Waste	____	____	____	____
Regulated Wastes	____	____	____	____
TOTAL	____	____	____	____
Storage Tank Management				
Aboveground Tanks	____	____	____	____
Underground Tanks	____	____	____	____
TOTAL	____	____	____	____
Toxic Substances Management				
PCB	____	____	____	____
Asbestos	____	____	____	____
Radon Mitigation	____	____	____	____
Lead-Based Paint	____	____	____	____
Low Level Radiation	____	____	____	____
TOTAL	____	____	____	____

(continued)

Figure 3 (continued)

Detailed Environmental Compliance Status

	FINDINGS			
Compliance Area	**Sig**	**Major**	**Minor**	**TOTAL**
Wastewater Management				
Sanitary Wastewater	____	____	____	_____
Industrial Wastewater	____	____	____	_____
Stormwater Runoff	____	____	____	_____
Nonpoint runoff	____	____	____	_____
Facilities/Equipment	____	____	____	_____
Oil/Water Separators	____	____	____	_____
TOTAL	____	____	____	____
Water Quality Management				
Drinking Water	____	____	____	____
TOTAL	____	____	____	____
TOTAL FINDINGS	____	____	____	____

Figure 4

Environmental Compliance Status

	Findings			
Totals Identified	**Sig**	**Major**	**Minor**	**TOTAL**
Discharge	____	____	____	____
Potential Discharge	____	____	____	____
Administrative	____	____	____	____
TOTAL FINDINGS	____	____	____	____

Chapter 2.0. Background and Scope The background and scope section is reserved for information needed to make a complete report but which does not fit into the executive summary or compliance findings section.

1. Background.

   a. ECAMP Objectives. A statement of the ECAMP objectives as stated in this manual and individual objectives unique to each specific assessment.
   b. Installation Description. Describe the major attributes of the installation.
   c. Environmental Management Structure. Describe in general how the installation's environmental management organization is structured.

2. Scope.

   a. Activity Review. Describe the base activities that were inspected (this is the appropriate section for positive statements). Comment on the state and local or host nation regulations that were considered. Identify any permits or licenses (by number and issuing agency) that were reviewed.
   b. Summary of Evaluation Procedures. A statement that the assessment included a review of documentation, inspection of facilities, interviews of personnel, and that samples were or were not collected.

Chapter 3.0. Environmental Compliance Status The regulatory compliance section of the report should contain a separate subsection for each assessed checklist. The information presented in Figure 4 (page xli) pertains to each compliance section. Each compliance finding may consist of two parts: a findings paragraph and a separate observations and comments paragraph as follows:

1. Findings. Findings may be positive or negative. Positive findings (descriptions of exemplary activities and procedures) should be stated concisely. Negative findings will be limited to noncompliance issues involving FGS-ROK, DOD, and/or AF documents and should briefly summarize the permit conditions or other restrictions, note the deficiency, and cite the specific regulation (be specific). Where applicable, describe the total sample universe, the number of items sampled, and how many were out of compliance:

   a. Ensure that each negative finding is clearly identified as regulatory, host country, or procedural.
   b. Negative findings that were closed since the last ECAMP and have occurred again must be identified as repeat findings.
   c. Negative findings that remain open since the last external ECAMP must be identified as carryover findings.
   d. Ensure that each finding paragraph is concise, factual (conditions clearly in noncompliance with criteria), and free of the assessor's opinions and recommendations. If there is uncertainty over the regulations that apply, their meaning, or the actual conditions on the installation, place such comments in the Environmental Practice Issues Section of the report.
   e. Negative findings will be separately labelled and numbered. All negative findings will include finding identification codes for summarizing ECAMP results. See the explanation of how to fill out the findings summary for a listing of codes.

2. Observations and Comments on Compliance Findings. Since the finding paragraphs are reserved for strictly factual compliance criteria and conditions, all comments and recommendations on a compliance finding will be placed in a separate comments paragraph immediately following the finding. No new findings will be introduced in the comments paragraphs. Information in the comments paragraphs may include background information on a finding if necessary, statements on causes and effects, and a recommendation for correcting the deficiency. Assessment teams are under no obligation to make recommendations. When recommendations are made, they should be aimed at resolving root causes. Often, the onsite portion of the assessment does not permit time to identify root causes. Recommendations made under these conditions usually address symptoms rather than providing permanent solutions.

Chapter 4.0. Environmental Practice Issues. The assessment team may include recommendations for reducing environmental risks and improving environmental management practices as well as suggesting areas requiring additional study. Recommendations placed in this chapter are not based on environmental regulations and do not involve noncompliance. Instead, they are management practices that will help keep an installation in compliance. Items appropriate for this chapter include:

1. Environmental risk reduction issues not associated with noncompliance.
2. Potential noncompliance based on final regulations with a future compliance deadline.
3. Management practice recommendations based on items in the ECAMP checklist.
4. Other management practice recommendations.

Chapter 5.0. Management Action Plan. The management action plan states how each compliance finding was resolved or contains the installation EPC's plan for resolving the compliance finding. The Management Action Plan also states how each environmental practice issue is being addressed. Since environmental practice issues do not involve noncompliance, they should be carefully reviewed by the installation EPC, but may be closed without action. After the installation approves the Management Action Plan, it should be included in the Draft Final Environmental Assessment Report as Chapter 5. The Management Action Plan tracks each compliance finding or environmental issue.

Table 1: Sample Previsit Environmental Management Questionnaire

	OPR	DATE	
ITEM	**YES**	**NO**	**N/A**
This questionnaire will provide background information necessary to plan and conduct an environmental compliance assessment.			
Name of Installation:_____			
Air Emissions Management			
1. Does the installation operate one or more fuel burner?	—	—	—
a. Central steam plant?	—	—	—
b. Hot water?	—	—	—
c. Other _____			
d. Approximate size of fuel burner _____			
2. Are any hazardous or toxic air pollutants present in the installation's air emissions (e.g., beryllium, mercury, and vinyl chloride)?	—	—	—
3. Is the installation subject to any of the following air emission standards:			
a. Particulates?	—	—	—
b. NO_x?	—	—	—
c. SO_2?	—	—	—
d. Volatile organic compounds (VOCs)?	—	—	—
e. CO?	—	—	—
f. Toxic air pollutants?	—	—	—
If yes, please specify source of standards: _____			
4. Does the installation operate any incinerators (i.e., for classified documents, medical waste, solid waste, etc.)?	—	—	—
a. How many? _____			
b. What type? _____			
Attach list of locations.			
5. Does the installation engage in:			
a. Open burning?	—	—	—
b. Open detonation?	—	—	—
c. Fire fighter training?	—	—	—
6. Does the installation use any solvent degreasers?	—	—	—
7. Does the installation have a drycleaning facility?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
8. Does the installation have a:			
a. Spray painting operation?	—	—	—
b. Surface coating operation?	—	—	—
Attach list of locations if answered yes to either.			
9. Have installation emissions resulted in complaints from the public due to:			
a. Odors?	—	—	—
b. Fugitive dusts?	—	—	—
c. Other? _____	—	—	—
10. Does the installation use air pollution control equipment?	—	—	—
If yes, please list and explain:			
_____			
_____			
11. Does installation operate a motor vehicle station?	—	—	—
12. Does the installation dispense fuel to motor vehicles?	—	—	—
13. List each fuel storage area and the fuel type.			
Fuel type Quantity Fuel type Quantity			
_____ _____ _____ _____			
_____ _____ _____ _____			
14. Does the installation have active aircraft operations?	—	—	—
15. Does the installation have active aircraft maintenance operations?	—	—	—
16. Does the installation have AGE operations?	—	—	—
17. Does the installation recycle/reclaim chlorofluorocarbon (CFCs) or halons? Where?	—	—	—
18. Please list any additional shop activities that generate any form of air pollution:			
_____			
_____			

Cultural Resources Management

1. Does the installation have an area which is designated as any of the following? (If so, please have maps indicating locations available for team on arrival.):			
a. Cultural resource?	—	—	—
b. Archaeological resource?	—	—	—
c. Historic structure?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
Hazardous Materials Management			
1. Does the installation store any flammable materials?	—	—	—
2. Does the installation transport any hazardous materials off-installation?	—	—	—
3. Does the installation have a procedure to ensure the proper labeling, packaging, and spill response for hazardous materials?	—	—	—
4. Does the installation store:			
a. Acids?	—	—	—
b. Caustics?	—	—	—
c. Flammables?	—	—	—
d. Combustibles?	—	—	—
e. Compressed gases?	—	—	—
f. Oxidizers?	—	—	—
Hazardous Waste Management			
1. Does the installation produce any wastes classified as:			
a. Ignitable?	—	—	—
b. Corrosive?	—	—	—
c. Reactive?	—	—	—
d. Toxic?	—	—	—
2. Does the installation operate a Hazardous Waste Storage Area onsite?	—	—	—
3. Does the installation treat or dispose of hazardous wastes onsite?	—	—	—
If so, please specify waste type and treatment method: _____			
4. Does the installation accept wastes from other installations for treatment, storage, or disposal?	—	—	—
5. Does the installation engage in the transportation of hazardous wastes:			
a. Onbase?	—	—	—
b. Offbase?	—	—	—
c. Central transport (transportation squadron)?	—	—	—
d. Individual unit transport?	—	—	—
6. Does the installation have a hazardous waste management (contingency) plan?	—	—	—
7. Does the installation have a spill, prevention, and response (contingency) plan?	—	—	—
8. Does the installation utilize other locations for the treatment, storage, or disposal of hazardous waste?	—	—	—
Please specify: _____			

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
9. Does the installation use any nonhazardous solid waste (including used oil) as a supplemental fuel source?	—	—	—
10. Does the installation have a contractor dispose of its hazardous waste?	—	—	—
Which office monitors this contract? _____			
11. Does the installation have any tank systems used in the treatment or storage of hazardous waste?	—	—	—
Natural Resources Management			
1. Does the installation have an area designated as a natural resource, including highly protected and more generally protected?	—	—	—
2. Does the installation have a plan for managing its natural resources?	—	—	—
3. Does the installation serve as habitat for any threatened or endangered species?	—	—	—
4. Are there any areas on the installation which have any of the following? (If so, please have maps indicating locations available for team on arrival.):			
a. Wetlands?	—	—	—
b. Flood Plains?	—	—	—
Other Environmental Issues			
Environmental Impacts			
1. Does the base civil engineering office perform Environmental Planning functions?	—	—	—
Do they maintain copies of AF Form 813, *Request for Environmental Analysis*?	—	—	—
2. Does the Environmental Protection Committee review, and approve or disapprove environmental documents during the EIAP?	—	—	—
Environmental Noise Management			
3. Does the installation have an active runway?	—	—	—
4. Does the installation have any operations or maneuvers that produce environmental noise (i.e., target ranges, skeet range, helicopter pad)?	—	—	—
Installation Restoration Program			
5. Does the installation currently have any designated IRP sites?	—	—	—
Pollution Prevention			
6. Does the installation have a Pollution Prevention Management Plan?	—	—	—
7. Does the installation still purchase ODCs?	—	—	—
8. Does the installation reclaim ODCs?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
9. Are the purchase, issue, and distribution of hazardous materials under centralized control?	—	—	—
10. Does the installation have a hazardous waste minimization program?	—	—	—
11. Does the installation have a Qualifying Recycling Program?	—	—	—
12. Does the installation actively purchase recycled products?	—	—	—
13. Does the installation operate a Hazardous Materials Pharmacy?	—	—	—
14. Are the hazardous materials managed by the Hazardous Materials Pharmacy supplied through the Standard Base Supply System (SBSS)?	—	—	—
15. Does the Hazardous Materials Pharmacy centrally manage materials from other sources of supply (i.e., COCESS, IMPAC, COPARS, NAF, MEDLOG, other installation contractors, local purchase)?	—	—	—
Program Management			
16. Does the installation operate an air-to-surface weapon range?	—	—	—
17. Does the installation include all environmental projects listed in the Civil Engineering Contract Reporting System (CECORS) in the A-106 report?	—	—	—
18. Does the installation have a single POC for the A-106 Pollution Abatement Plan?	—	—	—
19. Who is responsible for the quality and dating of the automated A-106 WIMS-ES?			
_____			
20. Does the installation have a mechanism in place to ensure that the automated A-106 accurately reflects the project and requirement data maintained in other databases (CECORS, Programming Design and Construction (PDC), etc.)?	—	—	—
21. Does the installation accurately reflect financial data (obligations, expenditures) in the A-106 systems?			
22. Does the installation receive deployments from CONUS or other locations?	—	—	—
Pesticide Management			
1. Does the installation use pesticides in regulated quantities?	—	—	—
2. Do installation personnel apply pesticides?	—	—	—
3. Does the installation hire contractors to apply pesticides?	—	—	—
4. Are pesticide wastes disposed of at the installation?	—	—	—
5. Are pesticides stored on the installation?	—	—	—
Please list locations:			
_____			
_____			
6. Are medical records kept for individuals involved in the management of pesticides?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

	OPR DATE		
ITEM	**YES**	**NO**	**N/A**
7. Where are pesticides prepared at the installation?			
_____			
_____			
Petroleum, Oil and Lubricant (POL) Management			
1. Does the installation have a motor pool?	—	—	—
a. How many?_____			
b. Locations (if more than one)			
2. Does the installation store oil in large volumes?	—	—	—
3. Does the installation have a spill prevention and response plan?	—	—	—
4. Does the installation's spill plan include provisions pertaining to hazardous substances or hazardous wastes?	—	—	—
5. Does the installation conduct spill response training?	—	—	—
6. Does the installation use fuel bladders during field exercises?	—	—	—
7. Does the installation have any oil/water separators? (Please have a map available for the team showing locations.)	—	—	—
8. Does the installation use a hydrant system for aircraft fueling?	—	—	—
9. Does the installation use fuel trucks for aircraft fueling?	—	—	—
Solid Waste Management			
1. Does the installation have a solid waste management facility onsite?	—	—	—
2. Does the installation have a:			
a. Resource recovery facility (DRMO) on the installation?	—	—	—
b. Resource recovery facility (DRMO) off the installation?	—	—	—
c. Sanitary landfill?	—	—	—
d. Construction debris landfill?	—	—	—
e. Municipal solid waste landfill?	—	—	—
f. Solid waste incinerator?	—	—	—
g. Solid waste recycling program?	—	—	—
h. Composting facility for sludge from a domestic wastewater treatment plant?	—	—	—
3. Does the installation have any unofficial landfill sites that are no longer in use?	—	—	—
4. Is waste transported off-installation for disposal:			
a. In landfills?	—	—	—
b. In incinerators?	—	—	—
c. Others (specify):_____	—	—	—
5. Does the installation dispose of ash residues or sludge:			

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
a. Onbase?	—	—	—
b. Offbase?	—	—	—
6. Is the installation monitored for:			
a. Leachate?	—	—	—
b. Groundwater?	—	—	—
7. Does the installation currently dispose of, or has it been used for the disposal of asbestos?	—	—	—
8. Does the installation generate medical/pathological wastes?	—	—	—
9. Does the installation dispose of medical/pathological wastes onbase by incineration?	—	—	—
Storage Tank Management			
1. Do the installation's aboveground storage tanks have properly sized and constructed containment dikes equipped with draws?	—	—	—
2. Does the installation have jet fuel disposing/hydrant systems?	—	—	—
If yes, how many USTs serve each pump house (normally Panars and Pitch) and system?			
_____			
_____			
3. Does the installation have a ground vehicle fuel storage yard?	—	—	—
If yes, how many USTs are in the ground vehicle fuel storage yard and what size are they?			
_____			
_____			
4. Does the installation have an Army/Air Force Exchange Service (AAFES)-run or other type of gas station located on the base?	—	—	—
If yes, how many USTs are located at the gas station and what size are they?			
_____			
_____			
5. Does the base have any other USTs used to store petroleum products?	—	—	—
If yes, where are they located, how many are there, and what size are they?			
_____			
_____			
6. Does the installation have any USTs used for storing heating fuel located at individual buildings?	—	—	—
If yes, how many USTs are located at the gas station and what size are they?			
_____			
_____			

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
7. Does the installation have any USTs used to store hazardous substances?	—	—	—
If yes, where are they located, how many are there, what size are they, and what hazardous product do they contain?			
_____			
_____			
8. Does the installation have any underground tanks out-of-service?	—	—	—
If yes, provide locations:			
_____			
_____			
_____			
_____			
_____			
_____			
Toxic Substances Management			
PCBs			
1. Are PCB (polychlorinated biphenyl) or PCB-contaminated fluids in use or stored on the installation:			
a. Transformers?	—	—	—
b. Capacitors?	—	—	—
c. Switch gear?	—	—	—
d. Circuit Breakers?	—	—	—
e. Other? _____	—	—	—
2. Are there any PCB items in storage for disposal?	—	—	—
Item Concentration			
_____ _____			
_____ _____			
_____ _____			
_____ _____			
3. Does installation dispose of PCBs or PCB-contaminated equipment on- or offbase?	—	—	—
Asbestos			
4. Does the installation have Air Force-owned primary or secondary schools?	—	—	—
5. Has the installation conducted a complete base-wide asbestos facility survey?	—	—	—
6. Does the installation have a written Asbestos Management Plan?	—	—	—
7. Does the installation have a written Asbestos Operating Plan?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
8. Does the installation operate an in-house asbestos removal team?	—	—	—
9. Has the installation undergone any asbestos removal projects in the past?	—	—	—
10. Is there any asbestos on the installation that has been removed and is awaiting disposal at this time?	—	—	—
11. Will the installation have any demolition, remodeling or renovation projects underway at the time of the ECAMP assessment?	—	—	—
Please identify those projects and buildings:			
_____			
_____			
_____			
_____			
12. Does the installation maintain training records for asbestos workers?	—	—	—
Location of records:			
_____			
13. Does the installation dispose of asbestos on the installation?	—	—	—
Radon			
14. Is the installation located in a geographic area where high levels of radon are typically found?	—	—	—
15. Has the installation been monitored for radon?	—	—	—
Location of records			
_____			
LBP			
24. Does the installation have a LBP Management Plan?	—	—	—
25. Is LBP currently being used on the installation in the course of maintenance or construction?	—	—	—
26. Are any buildings with LBP hazards being demolished or renovated?	—	—	—
27. Has the installation ever had a case of elevated levels of lead in the blood?	—	—	—
28. Has the installation been identified for closure?	—	—	—
Wastewater Management			
1. Does the installation have any discharges of the following:			
a. Stormwater runoff from operational or storage area?	—	—	—
b. Stormwater runoff from undeveloped area?	—	—	—
c. Dredge and fill solids drainage water?	—	—	—
d. Wastewater treatment effluent?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ITEM	OPR DATE YES	NO	N/A
e. Process wastewater?	—	—	—
f. Heat or power production cooling water?	—	—	—
g. Other?_____	—	—	—
2. Does the installation discharge into a publicly owned treatment works (POTW)?	—	—	—
If yes, please specify types of discharge: (i.e., process wastewater, sanitary wastewater, etc.)			
_____			
_____			
3. Does the installation make use of an onsite wastewater treatment system prior to effluent discharge?	—	—	—
4. Does the installation conduct any effluent monitoring?	—	—	—
5. Are monitoring samples analyzed by:			
a. Installation personnel?	—	—	—
b. Offsite contractor?	—	—	—
6. Does the installation have a separate stormwater runoff system?	—	—	—
7. Does the installation have vehicle/aircraft washrack (or other designated vehicle/aircraft wash areas)?	—	—	—
Water Quality Management			
1. Does installation operate a public water system?	—	—	—
2. Does the installation operate a community water system?	—	—	—
3. Does the installation operate a noncommunity water system?	—	—	—
4. Does the installation operate a nontransient, noncommunity water system?	—	—	—
5. Does any portion of the installation's drinking water supply come from onsite wells or surface water sources?	—	—	—
6. Does the installation monitor onsite drinking water sources?	—	—	—
7. Does the installation provide filtration of its drinking water?	—	—	—
If yes, what type of filtration?_____			
General Information			
1. Does the installation contain water protection areas?	—	—	—
2. Is the installation suspected of contributing to a groundwater contamination problem?	—	—	—

(continued)

Table 1: Sample Previsit Environmental Management Questionnaire (continued)

ALL PURPOSE CHECKLIST	PAGE OF PAGES

Briefly state the installation mission, size, scope of operations, and activities. Include approximate base population, housing units, industrial operations, aerospace systems supported land area, and other significant factors:

Signature of individual completing this form:_____

Date completed:_____

ATTENTION: The following records should be available for review by the assessment team either prior to the assessment or immediately upon arrival at the installation.

(NOTE: Not all installations will have, or are even required to have, all of the following documents.)

General

1. Detailed maps of the installation indicating street names and building numbers. Enough for one for every member of the assessment team
2. A phone list
3. Copies of notice of violations (NOVs) issued to the installation in any of these areas

Air Emissions Management

1. Air emissions inventory
2. All air related permits
3. A list of steam generating units and boilers and their size, fuel used, and locations

Cultural Resources Management

1. Any cultural or archeological resources surveys
2. Management plans for cultural and archeological resources
3. A list of properties included on the host nation's equivalent of the National Register

Hazardous Materials Management

1. A list of hazardous material storage/use areas
2. A waste minimization plan
3. Material Safety Data Sheet (MSDS)
4. Documentation of personnel training
5. A copy of any reports of spills
6. Copies of the Tier I or Tier II reports
7. Documentation on contaminated sites

Hazardous Waste Management

1. The Hazardous Waste Management Plan
2. A list of hazardous wastes generated at the installation
3. A list of waste generation/storage areas
4. Manifests
5. Any permits
6. The biennial report
7. Personnel training records

Natural Resources Management

1. The endangered species survey
2. The Natural Resources Management Plan
3. Any land management plans

Other Environmental Issues

Environmental Impacts

1. Recent environmental assessments (EAs), environmental impact statements (EISs), Environmental Studies, Environmental Reviews

Environmental Noise Management

2. ICUZ dccumentation
3. Noise complaints

Installation Restoration Program

4. IRP documentation

Pollution Prevention

5. The Pollution Prevention Management Plan

Program Management

6. The A-106 Pollution Abatement Plan

Pesticides Management

1. The Pesticide Management Plan
2. A list of pesticide storage sites
3. Application records
4. MSDSs for pesticides
5. Personnel certifications for applicators
6. Contracts for pesticide application

Petroleum, Oil, and Lubricant (POL) Management

1. The Spill Prevention, Control, and Countermeasures SPCC plan
2. A list of POL storage areas

Solid Waste Management

1. Any contracts with waste haulers
2. Any recycling plans
3. All documentation pertaining to landfill operation or closure
4. Records on groundwater sampling resulting from monitoring wells

Storage Tank Management

1. List of organizational fuel tanks
2. List of support tanks authorized to receive fuel
3. Records of all spills and leaks and associated site assessement/cleanup activities
4. Tank custodian training records
5. UST inventory
6. UST integrity test results
7. Upgrading and/or closure plans and site contamination reports after tank removals

Toxic Substances Management

1. The PCB inventory
2. The PCB annual report
3. The results of the asbestos survey
4. The Asbestos Management Plan
5. Radon survey results.
8. Lead-based Paint Management Plan

Wastewater Management

1. Maps of the storm, sanitary, and industrial sewers
2. A copy of pretreatment standards imposed on the installation
3. A list of maintenance shops/operations, including wash facilities
4. Locations of holding ponds, sedimentation pits, and open/end-of-pipe discharge points

Water Quality Management

1. Copies of drinking water test results

Table 2

Major Activities/Operations	Sections			
	Air Emissions Management 1	Cultural Resources Management 2	Hazardous Materials Management 3	Hazardous Waste Management 4
1. Incinerators	•			•
2. Heat/Power Production	•			•
3. AGE Operation	•		•	•
4. Aircraft Operations	•			
5. Aircraft Maintenance			•	•
6. Fuel Storage	•		•	
7. Surface Coating Operations	•		•	•
8. Sanitary Wastewater				
9. Stormwater Runoff				
10. Sludge Disposal	•			
11. POL Dispensing	•			
12. Wastewater Treatment				
13. Vehicle Maintenance	•		•	•
14. Shop Activities	•		•	•
15. Solid Waste Generation				
16. Water Supply				
17. Toxic/hazardous Materials Use			•	
18. Firefighting Training	•			
19. PCB Electrical Equipment				
20. Pesticide/ Herbicide Use				•
21. Environmental Noise				
22. Emergency Planning			•	•
23. Asbestos Removal				
24. Underground Storage Tanks	•		•	•
25. Remodeling Activities		•		
26. Construction Activities		•		
27. Soil Removal		•		

(continued)

Table 2 (continued)

Major Activities/Operations	Sections			
	Natural Resources Management 5	Other Envirnmtl Issues 6	Pesticide Management 7	POL Management 8
1. Incinerators				
2. Heat/Power Production				•
3. AGE Operation				•
4. Aircraft Operations		•		•
5. Aircraft Maintenance		•		•
6. Fuel Storage				•
7. Surface Coating Operations		•		
8. Sanitary Wastewater				
9. Stormwater Runoff			•	•
10. Sludge Disposal		•		
11. POL Dispensing				•
12. Wastewater Treatment				
13. Vehicle Maintenance		•		•
14. Shop Activities		•		
15. Solid Waste Generation		•		
16. Water Supply				
17. Toxic/hazardous Materials Use		•		
18. Firefighting Training				•
19. PCB Electrical Equipment				
20. Pesticide/ Herbicide Use			•	
21. Environmental Noise		•		
22. Emergency Planning				•
23. Asbestos Removal				
24. Underground Storage Tanks				•
25. Remodeling Activities	•			
26. Construction Activities	•			
27. Soil Removal	•			

(continued)

Table 2 (continued)

Major Activities/Operations	Sections			
	Solid Waste Management 9	Storage Tank Management 10	Toxic Substances Management 11	Wastewater Management 12
1. Incinerators	•			
2. Heat/Power Production	•	•		•
3. AGE Operation		•		
4. Aircraft Operations				
5. Aircraft Maintenance				•
6. Fuel Storage		•		
7. Surface Coating Operations				•
8. Sanitary Wastewater				•
9. Stormwater Runoff				•
10. Sludge Disposal	•			•
11. POL Dispensing				
12. Wastewater Treatment				•
13. Vehicle Maintenance	•		•	•
14. Shop Activities	•			•
15. Solid Waste Generation	•			
16. Water Supply				
17. Toxic/hazardous Materials Use			•	
18. Firefighting Training				•
19. PCB Electrical Equipment			•	
20. Pesticide/ Herbicide Use				•
21. Environmental Noise				
22. Emergency Planning				
23. Asbestos Removal			•	
24. Underground Storage Tanks		•		
25. Remodeling Activities	•		•	
26. Construction Activities	•		•	
27. Soil Removal				

(continued)

Table 2 (continued)

Major Activities/Operations	Sections			
	Water Quality Management 13			
1. Incinerators				
2. Heat/Power Production				
3. AGE Operation				
4. Aircraft Operations				
5. Aircraft Maintenance				
6. Fuel Storage				
7. Surface Coating Operations				
8. Sanitary Wastewater				
9. Stormwater Runoff				
10. Sludge Disposal				
11. POL Dispensing				
12. Wastewater Treatment				
13. Vehicle Maintenance				
14. Shop Activities				
15. Solid Waste Generation				
16. Water Supply	•			
17. Toxic/hazardous Materials Use				
18. Firefighting Training				
19. PCB Electrical Equipment				
20. Pesticide/ Herbicide Use				
21. Environmental Noise				
22. Emergency Planning				
23. Asbestos Removal				
24. Underground Storage Tanks				
25. Remodeling Activities				
26. Construction Activities				
27. Soil Removal				

Glossary of Acronyms

Acronym	Expansion
AAFES	Army/Air Force Exchange Service
ACM	asbestos-containing material
ACWM	asbestos-containing waste material
AF	Air Force
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AFJ	Air Force Joint [Publication]
AFM	Air Force Manual
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
AFP	Air Force Pamphlet
AFPD	Air Force Policy Directive
AFPMB	Armed Forces Pest Management Board
AFR	Air Force Regulation
AFTO	Air Force Technical Order
AGE	aerospace ground equipment
API	American Petroleum Institute
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
AVGAS	aviation gasoline
BASH	Bird Air Strike Hazard
BOD	biochemical oxygen demand
BRAC	Base Realignment and Closure
CAA	*Clean Air Act*
CAS	Chemical Abstract Service
CATEX	categorical exclusion
CBOD	carbonaceous biochemical oxygen demand
CBPO	Consolidated Base Personnel Office
CDC	Child Development Center
CE	Civil Engineering
CECORS	Civil Engineering Contract Reporting System
CEP	Civil Engineering Programmer

(continued)

Glossary of Acronyms (continued)

Acronym	Expansion
CERCLA	*Comprehensive Environmental Restoration, Compensation and Liability Act*
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CONUS	continental United States
CPSA	*Consumer Product Safety Act*
CT	concentration/time
CWS	community water system
DCM	Deputy Commander for Maintenance
DLA	Defense Logistic Agency
DOD	Department of Defense
DODAAC	DOD Activity Address Code
DODD	DOD Directive
DODI	DOD Instruction
DOE	Department of Energy
DOPAA	description of proposed action and alternatives
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
DWTP	domestic wastewater treatment plant
EA	environmental analysis
EA	environmental assessment
EA	Executive Agent
EBS	Environmental Baseline Survey
EC	Emergency Coordinator
EC	Environmental Coordinator
ECAMP	Environmental Compliance Assessment and Management Program
ECD	estimated compliance date
EHO	Environmental Health Officer
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EM	Environmental Manager
EMO	Environmental Management Office
EPC	Environmental Protection Committee
EPCRA	*Emergency Planning and Community Right-to-Know Act*

(continued)

Glossary of Acronyms (continued)

Acronym	Expansion
EPF	Environmental Planning Function
ER	environmental review
ES	environmental study
FGS	Final Governing Standards
GOCO	government-owned contractor-operated
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
HMTA	*Hazardous Materials Transportation Act*
HQ	Headquarters
HUD	Housing and Urban Development
HW	hazardous waste
HWAP	hazardous waste accumulation point
HWPS	hazardous waste profile sheet
HWSA	hazardous waste storage area
IAPMO	International Association of Plumbing and Mechanical Officials
IC	Installation Commander
ICUZ	installation compatible use zone
ID	(Finding) Identification
IEX	issue exception (code)
IOSC	Installation On-Scene Coordinator
IRP	Installation Restoration Program
IRT	Installation Response Team
ISCP	Installation Spill Contingency Plan
ITP	industrial toxic project
IWTP	industrial wastewater treatment plant
JCS	Joint Chiefs of Staff
LBP	lead-based paint
LCCA	*Lead Contamination Control Act*
LTI	lead toxicity investigation
MAJCOM	Major Command

(continued)

Glossary of Acronyms (continued)

Acronym	Expansion
MCL	maximum contamination level
MFH	military family housing
MILCON	military construction
MIPR	military interdepartmental purchase request
MOA	Memorandum of Agreement
MOGAS	motor gasoline
MP	Management Practice
MSDS	material safety data sheet
MSHA	Mine Safety and Health Administration
MSW	municipal solid waste
MSWLF	municipal solid waste landfill
MTR	military training route
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
NLR	noise level reduction
NOI	notice of intent
NOV	notice of violation
NPS	nonpoint (or nonstationary) source
NPWS	nonpublic water system
NTNCWS	nontransient, noncommunity water system
O&M	Operations and Maintenance
OCONUS	Outside of the Continental United States
ODC	ozone depleting chemical
ODS	ozone depleting substance
OEBGD	Overseas Environmental Baseline Guidance Document
OPR	Office of Primary Responsibility
OSC/RPM	On-Scene Commander/Remedial Project Manager
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PCMS	Project by Contract Management System
PDC	Programming, Design, and Construction (System)
PEL	permissible exposure limit
PMC	Pest Management Consultant
POC	point-of-contact

(continued)

Glossary of Acronyms (continued)

Acronym	Expansion
POE	point-of-entry
POL	petroleum, oil, and lubricant
POTW	publicly owned treatment works
POU	point of use
PPE	personal protective equipment
PWS	public water system
QAE	Quality Assurance Evaluator
QA/QC	quality assurance/quality control
QC&I	quality control and inspection
QRP	qualified recycling program
RAC	risk assessment code
RAMP	Radon Assessment and Mitigation Program
RCRA/HSWA	*Resource Conservation and Recovery Act/Hazardous and Solid Waste Amendments*
RCS	Report Control Symbol
RDF	refuse derived fuel
RMA	require management action
RQ	reportable quantity
RRR	Resource, Recovery, and Recycling (Program)
SARA	*Superfund Amendment and Reauthorization Act*
SBSS	Standard Base Supply System
SEL	sound exposure level
SF	standard form
SOFA	Status of Forces Agreement
SPCC	Spill Prevention, Control, and Countermeasures (Plan)
SUA	special use airspace
SWDA	*Solid Waste Disposal Act*
TIM	Technical Information Memoranda
TM	Technical Memorandum
TNCWS	transient, noncommunity water system
TO	Technical Order
TSDF	treatment, storage, and disposal facility
TSS	total suspended solids
TTHM	total trihalomethanes
UIC	unit identification code

(continued)

Glossary of Acronyms (continued)

Acronym	Expansion
ULV	ultra-low volume
UPC	Uniform Plumbing Code
USACERL	U.S. Army Construction Engineering Research Laboratories
USAF	U.S. Air Force
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VHAP	volatile hazardous air pollutant
VOC	volatile organic compound
VOL	volatile organic liquid
WIMS	Work Information Management System
WIMS-ES	Work Information Management System-Environmental Subsystem
WWTP	wastewater treatment plant

Abbreviations

C	Celsius
cm	centimeter
cm^2	square centimeter
F	Fahrenheit
ft	feet
ft^2	square feet
ft^3	cubic feet
g	gram
gal	gallons
gpd	gallons per day
gpm	gallons per minute
gr	grain
gr/dscf	grain/dry standard cubic foot
h	hour
ha	hectare
in.	inch
J	Joule
kg	kilogram
kPa	kiloPascal
kW	kilowatt
L	liter
lb	pound
m	meter
m^2	square meter
m^3	cubic meter
mi	mile
mg	milligram
mgd	million gallons per day
µg	microgram
µm	micrometer
min	minute
mo	month
mm	millimeter
mm Hg	millimeters of mercury
mrem	millirem
MW	megawatt
NTU	nephelometric turbidity unit
pCi	picoCurie
ppm	parts per million
ppmv	parts per million by volume
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
qt	quart
s	second
V	volt

CO	carbon monoxide
CO_2	carbon dioxide
Hg	mercury
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
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

Korea ECAMP

SECTION 1

AIR EMISSIONS MANAGEMENT

A. Applicability of this Section

This section includes regulations, responsibilities, and compliance requirements associated with air pollution emissions at Air Force (AF) installations. The major sources of air pollution emissions at AF installations are:

- particulates, SO_2, and NO_x from fuel burning at steam and hot water generation plants and boilers
- particulate emissions from the operation of classified material and pathological incinerators
- the emission of volatile organic compound (VOC) vapors from the storage and transfer of certain petroleum fuels and chemicals (solvents), and the operation of degreasers and other processes (paint stripping and metal finishing) that use solvents
- the emission of NO_x and hydrocarbons from aerospace ground equipment (AGE) and vehicles operated on the base.

Most AF installations have air emissions sources in each of these four categories. Therefore, this section is applicable to some extent at all AF installations.

The regulatory requirements in this section are based on Department of Defense (DOD), Air Force Regulations (AFRs), and Air Force Instructions (AFIs) that apply at overseas installations. Management Practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas, but are important to follow to preserve the health and safety of AF employees and protect the environment. Any procedural USEPA requirements, such as permits and notifications, are not applicable overseas and, therefore, are not in the Final Governing Standards - Republic of Korea (FGS-ROK) Manual. MPs in the Air Emissions Management section are derived from the following USEPA regulations: 40 Code of Federal Regulations (CFR) 51, 60, and 80.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 2 outlines performance standards for fossil fuel-fired steam generators, hot water generating plants, electric utility steam generators, and incinerators. Motor vehicles, ozone-depleting substances (ODSs), and VOCs are also included.

C. U. S. Air Force Documents

- AFR 19-6, *Air Pollution Control Systems for Boilers and Incinerators*, 9 May 1988, provides guidance on how to select, design, operate, and maintain emission control devices on boilers and incinerators. This AFR is scheduled to be replaced by Air Force Joint [Publication] (AFJ) 132-1056.

- AFI 48-119, *Medical Service Environmental Quality Program,* 25 July 1994, provides directive requirements for the Medical Service Environmental Quality Program and identifies responsibilities of participants in that program at U.S. AF bases.

- Air Force Technical Order (AFTO) 00-20B-5, *U.S. Air Force (USAF) Motor Vehicle and Vehicular Equipment Inspection*, establishes procedures for vehicle inspection and reporting on vehicle emissions.

D. Responsibility for Compliance

- The Combat Support Group Commander is usually the person responsible for compliance.
- Base Civil Engineering (BCE) is responsible for the maintenance of incinerators and fuel handling and storage equipment, as well as the operation and maintenance of all fuel burners (boilers). The heating and boiler plant managers are responsible for the operation of fuel burners and are part of the Operations Branch of Civil Engineering.
- The Environmental Coordinator in BCE is responsible for the preparation of all air pollution emission source permit applications.
- The regional hospital or base clinic is responsible for the operation of any pathological incinerators located in its facility.
- The Fuels Management Branch of Base Supply is responsible for the operation of all fuel handling, transportation (tanks and/or pipelines), and storage facilities onbase. They are also responsible for insuring that all fuels satisfy specifications.
- The Fuels Management Branch is also responsible for operating the Military Service Station that dispenses leaded or unleaded fuel.
- The Automotive Maintenance Branch of Base Transportation is responsible for the emission testing and vehicle maintenance required by FGS-ROK and AF documents.
- The various maintenance squadrons at the base are responsible for the operation of degreasers and other industrial processes that are regulated or may require operating permits.
- The Base Exchange operates a service station that dispenses leaded and unleaded fuels and is subject to FGS-ROK requirements. The service station is normally operated by a contractor, but the labeling and nozzle size regulations still apply. The Government is responsible for compliance, but the contractor may also be responsible, depending on the contract wording.
- Bioenvironmental Engineering Services (BES) is responsible for monitoring ambient air quality and preparing the installation air emission inventory.

E. Definitions

- *Air Pollutants* - those gases, particulate matter, or offensive odors that cause air pollution (See Table 1-1) (FGS-ROK, Chapter 2, Definitions).
- *Automobile Emissions Standards* - these concern the following substances discharged from automobiles: CO, HC, smoke (FGS-ROK, Chapter 2, Definitions)

- *British Thermal Unit (Btu)* - the quantity of heat required to raise the temperature of 1 lb of water by 1 °F (FGS-ROK, Chapter 2, Definitions).

- *Clean Fuel* - gaseous fuel such as liquid natural gas or liquid petroleum gas that does not emit air pollutants (FGS-ROK, Chapter 2, 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-ROK, Chapter 2, Definitions).

- *Dust* - particulate matter that floats, scatters, or descends in the air (FGS-ROK, 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-ROK, Chapter 2, Definitions).

- *Flying Dust* - products emanating from the following activities: (FGS-ROK, Chapter 2, Definitions)
  1. manufacturing or processing cement, lime, plaster, or cement-related products
  2. mining, manufacturing, or processing noniron substances
  3. manufacturing primary irons
  4. construction.

- *Fossil Fuel* - natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful heat (FGS-ROK, Chapter 2, Definitions).

- *Fuel Additives* - chemical substances, excluding those composed of carbon and hydrogen only, which improve the function of automobiles or decrease automobile emission, including additives to improve octane value, to rinse parts, to clean parts by dispersion, to suppress smoke, to improve fluidity, and other multipurpose additives, for emission gas control (FGS-ROK, Chapter 2, Definitions).

- *Gas* - gaseous substances generated during burning, synthesizing, analyzing, or generated by the physical properties of materials (FGS-ROK, 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-ROK, Chapter 2, Definitions).

- *Low-sulfur Fuel* - fuel that meets sulfur content standards. Use of this fuel may be mandated in certain circumstances (FGS-ROK, Chapter 2, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Micron* - a unit of length equal to one-millionth (10^{-6}) of a meter (FGS-ROK, Chapter 2, Definitions).

- *MOE* - the Korean Ministry of Environment (FGS-ROK, Chapter 2, Definitions).

- *Nanogram* - one billionth (10^{-9}) of a gram (FGS-ROK, Chapter 2, Definitions).

- *New* - any facility, source, or project with a construction start date on or after 1 January 1996 (FGS-ROK, Chapter 1).

- *Nontactical Vehicles* - commercially available vehicles that are adapted for military use (FGS-ROK, Chapter 2, Definitions).

- *Offensive Odor* - unpleasant smell produced from hydrogen sulfide, mercaptans, amines, and other irritating gaseous substances (FGS-ROK, Chapter 2, Definitions).

- *Ozone-Depleting Substances (ODSs)* - those substances listed in Table 1-2 (FGS-ROK, Chapter 2, Definitions).

- *Particulate Matter* - minute solid or liquid particles of material that are generated by cutting, grading, heaping, reheaping, or any other mechanical treatment or by combustion, synthesis, or decomposition of materials (FGS-ROK, Chapter 2, Definitions).

- *Seoul Metropolitan Area* - the area including Inchon, Suwon, Kwacheon, Seongnam, Kwangmyung, Anyang, Eujungbu, Ansan, Euwang, Kunpo, Siheung, Kuri, and Koyang City (FGS-ROK, Chapter 2, Definitions).

- *Smoke* - minute particulate matter generated by combustion and composed mainly of free carbon (FGS-ROK, Chapter 2, Definitions).

- *Soot* - particulate matters composed of carbon generated by combustion, each particle of which has a diameter of 1 micron (μ) or more (FGS-ROK, Chapter 2, Definitions).

- *Special Counter Measure Areas (SCMAs)* - areas of special concerns where significant environment contamination or marked ecosystem changes are noticed and where the MOE may prescribe and impose more rigid permissible emission standards for newly built facilities emitting air pollutants (FGS-ROK, Chapter 2, Definitions).

- *Special Hazardous Air Pollutants* - air pollutants that are likely to become directly or indirectly hazardous to the public health or property or to the growth of animals and/or plants (See Table 1-1) (FGS-ROK, 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 generators associated with the combined cycle of gas turbines; nuclear steam generators are not included (FGS-ROK, Chapter 2, Definitions).

- *Substantial Modification* - any modification the cost of which exceeds one million dollars, regardless of funding source (FGS-ROK, Chapter 1).

- *Wood Residue* - bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood processing and forest management operations (FGS-ROK, Chapter 2, Definitions).

AIR EMISSIONS MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.1-1 through KO.1-4	(1)(2)(11)
Fuel-Burning Facilities (central steam plant, hot water boiler, or hot water steam boiler)	KO.1-5 through KO.1-12	(1)(2)(3)(4)
Fuel-Burning Sources	KO.1-13 through KO.1-18	(2)(3)
Incinerators	KO.1-19 and KO.1-20	(2)(3)
Open Burning	KO.1-21	(1)
Gasoline	KO.1-22 and KO.1-23	(4)(5)(10)
Motor Vehicles	KO.1-24 and KO.1-25	(5)
VOCs	KO.1-26 through KO.1-29	(2)(3)(4)
Fugitive Emissions	KO.1-30 through KO.1-35	(2)(3)
Vapor Degreasers	KO.1-36	(3)(4)(5)(7)(8)(9)(10)
Dry Cleaning	KO.1-37	(2)(3)
CFCs and Halons	KO.1-38 through KO.1-42	(2)(5)(6)(7)(8)(9)

(a) CONTACT/LOCATION CODE:

(1) BCE (Base Civil Engineering/Environmental Planning)
(2) BES (Bioenvironmental Engineering Services)
(3) Air Pollution Source Operator
(4) Fuels - Management Branch
(5) Transportation - Maintenance Branch
(6) Logistics Supply (LGS) (Base Supply)
(7) SV (Services Squadron) Auto Hobby Shop
(8) BCE (Refrigeration Shops)
(9) Equipment Maintenance Squadron
(10) AAFES (Army/Air Force Exchange Service) Gas Station
(11) Base Staff Judge Advocate

AIR EMISSIONS MANAGEMENT

Records To Review

- Emissions inventory
- All air pollution source permits
- Plans and procedures applicable to air pollution control
- Emission monitoring records
- Opacity records
- Instrument calibration and maintenance records
- Reports/complaints concerning air quality
- ROK regulatory inspection reports
- Documentation of preventive measures or actions
- Results of air sampling at the conclusion of response action

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

People To Interview

- BCE (Base Civil Engineering/Environmental Planning)
- BES (Bioenvironmental Engineering Services)
- Air Pollution Source Operator
- Fuels - Management Branch
- Transportation - Maintenance Branch
- LGS (Base Supply)
- SV (Services Squadron) Auto Hobby Shop
- BCE (Refrigeration Shops)
- Equipment Maintenance Squadron
- AAFES (Army/Air Force Exchange Service) Gas Station
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ALL INSTALLATIONS	
KO.1-1. Determine actions or changes since previous review of air emissions (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.1-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents on air emissions should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 48-119, *Medical Service Environmental Quality Programs*, 25 July 1994 - AFTO 00-20B-5, *USAF Motor Vehicle and Vehicular Equipment Inspections.* (NOTE: Regulations on asbestos management are addressed in Section 11, *Toxic Substances Management.*) Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.1-3. Installations must meet regulatory and AF requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning air quality have been issued since the finalization of the manual. (1)(2)(11) Verify that the installation is in compliance with newly issued regulations.
KO.1-4. Installations must take and maintain an air emissions inventory (AFI 48-119, para 9.5.1.2).	Verify that the installation has done an air emissions inventory. (2) Verify that BES maintains copies of the inventory.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
FUEL-BURNING FACILITIES	(NOTE: Emissions limitations and percent reduction requirements are determined on a 30-day rolling average.) (NOTE: Particulate matter emission criteria do not apply during periods of startup, shutdown, and malfunction.) (NOTE: SO_2 emission criteria do not apply during periods of startup and shutdown and when emergency conditions exist.)
KO.1-5. New or substantially modified fossil fuel-fired steam-generating units with a heat input capacity of greater than 100 MBtu/h heat input must meet specific emissions limitations for particulate matter and SO_2 (FGS-ROK, Chapter 2, Criteria 3a(1) through 3a(4)).	Determine whether the facility burns coal, oil, wood, or a combination of fuels. (3) 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. 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. Verify that discharged flue gases do not contain SO_2 in excess of 340 ng/J heat input (0.80 lb/MBtu) derived from liquid fossil fuel or liquid fossil fuel and wood residue. Verify that discharged flue gases do not contain SO_2 in excess of 520 ng/J heat input (1.2 lb/MBtu) derived from solid fossil fuel or solid fossil fuel and wood residue. Verify that such units do not exceed the permissible standards listed in Table 1-3.
KO.1-6. New or substantially modified fossil fuel-fired steam-generating units with a heat input capacity of greater than 100 MBtu/h heat input must meet specific emissions limitations for NO_x (FGS-ROK, Chapter 2, Criteria 3a(5) through 3a(7)).	Verify that flue gas discharged to the atmosphere does not contain NO_x in excess of the following: (2)(3) - 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. 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. (NOTE: This does 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.) Verify that such units do not exceed the permissible standards listed in Table 1-3.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-7. New or substantially modified fossil fuel-fired steam-generating units with a maximum design heat input capacity of greater than 100 MBtu/h must meet specific requirements with regard to fuel sulfur content (FGS-ROK, Chapter 2, Criterion 3a(8)).	Verify that the installation conducts and records measurements of fuel sulfur content for each fuel batch. (3)(4) Verify that the fuel sulfur content does not exceed 0.2 percent by weight.
KO.1-8. New or substantially modified fossil fuel-fired steam-generating units with a maximum design heat input capacity of greater than 100 MBtu/h must maintain records of ash contents and higher heating values (FGS-ROK, Chapter 2, Criterion 3a(9)).	Verify that the installation maintains a record of ash contents and higher heating values for the fuel combusted in the source. (3)(4)
KO.1-9. New or substantially modified steam-generating units or electric utility steam-generating units rated greater than 100 MBtu/h heat input must operate a properly calibrated and maintained continuous emissions monitoring system for opacity, NO_x, and the O_2 or CO_2 content of flue gases (FGS-ROK, Chapter 2, Criterion 3e).	Verify that the opacity of emissions is continuously monitored, except where gaseous or distillate fuels are the only fuels combusted. (2)(3) Verify that NO_x emissions are continuously monitored. Verify that the O_2 or CO_2 content of flue gases is continuously monitored at each location where either SO_2 or NO_x emissions are monitored.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-10. New or substantially modified electric utility steam-generating units with a rated capacity of greater than 100 MBtu/h heat input must meet specific emissions limitations (FGS-ROK, Chapter 2, Criteria 3b).	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. (2)(3) Verify that no flue gases are discharged that: - exhibit greater than 20 percent opacity, except for one 6-min period per hour of not more than 30 percent opacity - contain SO_2 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 SO_2 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 Table 1-4. (NOTE: When emissions of SO_2 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.) Verify that fuel consumption and electrical steam output values are verified monthly in order to calculate boiler efficiency. Verify that emissions do not exceed the permissible standards listed in Table 1-3.
KO.1-11. Existing and new or substantially modified steam generating units or electric utility or thermal heating units rated greater than 100,000 Btu/h (29 kW) but less than 100 MBtu/h heat input must have an annual tune-up so that specific operational requirements are met (FGS-ROK, Chapter 2, Criterion 3f).	Verify that the identified steam generating unit has an annual tune-up to ensure combustion efficiency of the unit so that the following requirements are met: (1)(2)(3) - for natural gas, the minimum excess oxygen level at high firing rates is 0.5 percent through 3 percent - for liquid fuels, the minimum excess oxygen levels at high firing rates is 2 percent through 4 percent - CO emissions are below 400 ppm by volume - the flame is stable and does not impinge on the furnace walls or burner parts - emissions do not exceed the permissible standards listed in Table 1-3.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-12. New or substantially modified steam generating units or electric utility steam generating units rated less than 100,000 Btu/h (29 kW) heat input must operate a properly calibrated and maintained continuous emissions monitoring system to measure O_2 emissions and CO emissions (FGS-ROK, Chapter 2, Criterion 3g).	Verify that such steam generating units operate a properly calibrated and maintained continuous emissions monitoring system for O_2 emissions and CO emissions. (3) Verify that such units do not exceed the permissible standards listed in Table 1-3.
FUEL-BURNING SOURCES	
KO.1-13. Fuel burning facilities with greater than 250 MBtu/h heat input should meet specific emissions standards (MP).	Verify that the opacity of emissions is less than 20 percent, except for one 6-min period of no greater than 27 percent per hour. (2)(3) Verify that particulate emissions do not exceed 0.10 lb/MBtu. Verify that SO_2 emissions do not exceed levels outlined in Table 1-5. Verify that NO_x emissions do not exceed levels outlined in Table 1-5.
KO.1-14. Fuel-burning facilities with greater than 250 MBtu/h heat input should be equipped with specific types of monitoring instruments (MP).	Verify that the following monitors are in place: (2)(3) - NO_2 continuous monitor - opacity monitor (except in gaseous fuel burners) - SO_2 monitor (except for fossil fuel-fired steam-generators not using a fuel gas desulfurization device, and gaseous fuel burners) - fuel sampling monitor when SO_2 monitor is not required - CO_2 or O_2 monitors (except when continuous monitoring systems are not required for SO_2 or NO_x). Verify that such monitors are calibrated and properly maintained. Verify that, for fuel consumption and electrical steam output instruments: - instruments are correctly installed and operating - instruments are calibrated every 24 h - monitoring records are maintained for 2 yr.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-14. (continued)	Verify that the installation maintains records of fuel analysis. Verify that such records contain information on: - sulfur content - ash content - heating value.
KO.1-15. Steam-generating units with a maximum design heat input capacity of greater than or equal to 10 MBtu/h but less than 100 MBtu/h should meet specific standards for emissions of particulates (MP).	Verify that facilities that combust coal or mixtures of coal with other fuels and have a heat input capacity of 30 MBtu/h or greater do not discharge particulate matter in excess of: (2)(3) - 22 ng/J heat input (0.05 lb/MBtu), if the facility combusts only coal or coal with other fuels and has an annual capacity factor of 10 percent for the other fuels - 43 ng/J heat input (0.10 lb/MBtu), if the facility combusts coal with other fuels, and has an annual capacity factor greater than 10 percent for the other fuels. Verify that facilities that combust wood or mixtures of wood with other fuels, except coal, and have a heat input capacity of 30 MBtu/h or greater do not discharge particulate matter in excess of: - 43 ng/J heat input (0.10 lb/MBtu), if the facility has an annual capacity factor for wood greater than 30 percent - 130 ng/J heat input (0.30 lb/MBtu), if the facility has an annual capacity factor for wood of 30 percent or less. Verify that facilities with a heat input capacity of greater than 30 MBtu/h that combust coal, wood, or oil do not discharge gases with greater than 20 percent opacity (6-min average), except for one 6-min period per hour of not more than 27 percent opacity. (NOTE: Particulate matter and opacity standards apply at all times, except during periods of startup, shutdown, or malfunction.)
KO.1-16. Steam-generating units with a maximum design heat input capacity of greater than or equal to 10 MBtu/h, but less than 100 MBtu/h, should meet specific monitoring standards for SO_2 and particulate matter (MP).	Verify that the installation installs, calibrates, maintains, and operates continuous emissions monitoring systems for measuring SO_2 concentrations and either O_2 or CO_2 concentrations at the outlet of the SO_2 control device or the outlet of the steam-generating unit if no control device is used. (2)(3) Verify that, if continuous emissions monitoring systems for SO_2 are not used, the fuel is sampled prior to combustion. Verify that the installation installs, calibrates, maintains, and operates a continuous monitoring system for measuring opacity.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-17. Municipal waste combustors with a capacity greater than 225 Mg (250 tons) per day of municipal solid waste or refuse-derived fuel should meet specific operational standards (MP).	Verify that gases are not discharged that contain the following constituents in excess of the least stringent amount listed: (2)(3) - dioxin/furan in excess of 30 ng/dscm (12 gr/bdscf, corrected to 7 percent O_2 (dry basis) - SO_2 in excess of 20 percent of the potential SO_2 emission rate or 30 ppm by volume, corrected to 7 percent O_2 (dry basis) - hydrogen chloride in excess of 5 percent of the potential hydrogen chloride emission rate (95 percent reduction by weight or volume), or 25 ppm by volume, corrected to 7 percent O_2 (dry basis) - NO_x emissions in excess of 180 ppm by volume, corrected to 7 percent O_2 (dry basis). Verify that facilities meet the operating standards for CO emissions outlined in Table 1-6. Verify that the installation implements the following operating practices: - facilities do not operate at a load level greater than 110 percent of the maximum demonstrated municipal waste combustor unit load - facilities do not operate at a temperature exceeding 17 °C [≈63 °F] above the maximum demonstrated particulate matter control device temperature.
KO.1-18. Municipal waste combustors with a capacity greater than 225 Mg (250 tons) per day of municipal solid waste or refuse-derived fuel should meet specific recordkeeping requirements (MP).	Verify that the installation maintains an operating manual at the facility. (2)(3) Verify that the operating manual includes: - applicable standards - procedures for receiving, handling, and feeding municipal solid waste - startup, shutdown, and malfunction procedures - operational provisions for meeting emission standards - response procedures for emergency situations - monitoring procedures - procedures for handling ash - reporting and recordkeeping requirements. Verify that the installation updates the operating manual annually.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-18. (continued)	Verify that the installation maintains records of the following for 2 yr: - emissions rates - dates when excess emissions were identified and reason for excess emissions - operating days when the minimum numbers of hours of SO_2 or NO_x emissions or operational data have not been obtained and the reasons - identification of the times when SO_2 or NO_x emissions or operational data have been excluded from the calculation of average emission rates or parameters and the reason for exclusion - results of daily SO_2, NO_x, and CO continuous emission monitoring systems drift tests and accuracy assessments - results of all annual performance tests - continuous emissions monitoring data for opacity, SO_2, NO_x, CO, load level, and particulate matter control device temperature - names of the people who have completed the review of the operating manual - weights of municipal solid waste and other fuel combusted when being used in a cofired combustor with a municipal waste capacity greater than 225 Mg/day (250 tons/day) - the amount of nonmedical and medical waste combusted on a daily basis for combustors firing both medical waste and other municipal solid waste, unless it is assumed that the total heat input to the combustor is from municipal solid waste with a design heating value of 10,500 kJ/kg (4500 Btu/lb).
INCINERATORS	
KO.1-19. New or substantially modified incinerators that burn more than 50 tons/day [≈45 metric tons/day] or that burn more than 10 percent sewage sludge must meet specific emissions limitations (FGS-ROK, Chapter 2, Criterion 3h).	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 CO_2. (2)(3) Verify that incinerators that process beryllium-containing waste, beryllium, beryllium oxide, or beryllium alloys do not emit more than 10 g [0.022 lb] of beryllium into the atmosphere over a 24-h period. Verify that emissions do not exceed the permissible standards listed in Table 1-3.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.1-20. Medical waste incinerators rated at 300 lb/h [≈136 kg/h] must meet specific limitations for gaseous pollutants (FGS-ROK, Chapter 2, Criterion 3i).	Verify that such incinerators do not exceed the following emissions limits: PM: 0.08 g/dscf (7000 grains = 1 lb) CO: 100 ppm @ 7percent O_2 (1 h average) HCL: 4 lb/h or 90percent reduction (from incinerator outlet to stack outlet) or 50 ppm @ 7percent O_2 (3 h average) SO_2: 45 ppm @ 7percent O_2 (hourly average) NO_x: 210 ppm @ 7percent O_2 Opacity: 10percent for 6 min in any 1 h, not to exceed 30% at any time; based on USEPA Method 9 Pb: 1.52 mg/m^3 Hg: 4.95 mg/m^3 Cd: 0.092 mg/m^3.
OPEN BURNING	
KO.1-21. Open burning is permitted only for fire fighting and infrequent vegetative debris management (FGS-ROK, Chapter 2, Criterion 3m).	Verify that open burning occurs only for fire fighting activities and only infrequently as a method of managing vegetative debris. (1) Verify that training on the use of open burning to fight fires is conducted only in training facilities that keep environmental damage to a minimum. Verify that only clean, uncontaminated lead-free fuels are used. Verify that open burning does not occur when weather conditions are unfavorable. Verify that the following are not disposed of by open burning: - hazardous material - hazardous waste - petroleum, oil, and lubricant (POL) - trash.
GASOLINE	
KO.1-22. Leaded gasoline should not be introduced into any motor vehicle that is labeled UNLEADED GASOLINE ONLY or that is equipped with a gasoline tank filler inlet designed for introduction of unleaded gasoline (MP).	Determine what grades of gasoline are used and where they are dispensed. (4)(5)(10) Verify that controls are in place to ensure proper fueling of vehicles. Verify that fuel pump nozzles are properly sized.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-23. Bulk gasoline terminals that deliver liquid product into large tank trucks should meet specific operating standards (MP).	(NOTE: A bulk gasoline terminal is any gasoline facility that receives gasoline by pipeline, ship, or barge, and has a gasoline throughput greater than 75,700 L/day [≈ 20,000 gal/day].) Verify that the bulk gasoline terminal has a vapor collection system designed to collect the total organic compound vapors displaced from tank trucks during product loading and to prevent the total organic compounds collected at on-loading racks from passing to another loading rack. (4)(5) Verify that emissions from the vapor collection system do not exceed 35 mg of total organic compound per liter of gasoline loaded. Verify that the following loading procedures are followed: - vapor tightness documentation is available for each gasoline tank truck - the tank identification number is recorded as each gasoline tank truck is loaded - each tank identification number is cross-checked with the file of tank vapor tightness documentation within 2 week after the tank is loaded - steps are taken to ensure that only vapor-tight tanks are loaded and that vapor collection systems are operational. Verify that the vapor collection and liquid loading equipment is designed and operated to prevent gauge pressure in the delivery tank from exceeding 4500 Pa (450 mm of water) during product loading. Verify that pressure vacuum vents in the vapor collection system do not open at a system pressure of less than 4500 Pa (450 mm of water). Verify that the installation conducts a monthly inspection of the vapor collection system, the vapor processing system, and each loading rack handling gasoline. Verify that the above inspections are conducted when loading is in progress. Verify that the installation establishes inspection records and keeps them on file for 2 yr. Verify that leaks are repaired within 15 calendar days after detection. Verify that records of all replacements or additions of components performed on existing vapor processing systems are kept for at least 3 yr.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
MOTOR VEHICLES	
KO.1-24. Installations must maintain U.S. Forces - Korea (USFK)-owned, nontactical vehicles and privately owned vehicles so as to prevent excessive emissions (FGS-ROK, Chapter 2, Criterion 3L).	Verify that all vehicles are visually inspected according to manufacturer and military maintenance instruction schedules to ensure that all factory-installed emission control equipment is intact and operational. (5) Verify that emission testing that meets the standards listed in Table 1-7 occurs at least every 2 yr. Verify that only unleaded gasoline is used in vehicles designed for unleaded gasoline. Verify that light duty and heavy duty engines meet the standards imposed according to the year of vehicle manufacture. Verify that vehicles using gasoline, Liquefied Petroleum Gas (LPG), or gas meet the standards for CO and hydrocarbon emissions from the exhaust pipe. Verify that vehicles using diesel fuel meet the standards for smoke and soot.
KO.1-25. All Air Force vehicles must be tested with an infrared exhaust tester (for gasoline engines) or an opacity meter (for diesel engines) to certify host nation exhaust emissions standards (AFTO 00-20B-5, Section 2-6(d)).	Verify that an infrared emission tester/opacity meter is used to certify emission tests on gasoline/diesel engines. (6)
VOCs	
KO.1-26. Publication rotogravure printing presses, except for proof presses, should meet specific VOC emissions standards (MP).	Determine whether the installation operates any publication rotogravure printing presses. (3) Verify that gases are not being discharged that contain VOCs in amounts greater than or equal to 16 percent of the total mass of VOC solvent and water used at that facility during any single performance averaging period. (NOTE: Each performance averaging period is 30 consecutive calendar days.)

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-26. (continued)	Verify that, if the installation uses waterborne ink systems or solvent-borne ink systems with solvent recovery systems, it records: - the amount of solvent and water used - the amount of solvent recovered - an estimated emission percentage for each calendar month. Verify that the installation maintains these records for 2 yr.
KO.1-27. Liquid petroleum storage vessels with a storage capacity greater than 151,600 L (40,000 gal) should meet specific standards (MP).	Determine the true vapor pressure of the liquids stored in such vessels. (2)(4) Verify that vessels storing petroleum liquid with a true vapor pressure equal to or greater than 1.5 psia [10.3 kPa absolute], but less than 11.1 psia [76.5 kPa absolute], are equipped with one of the following: - an external floating roof - a fixed roof with an internal floating type cover equipped with a continuous closure device between the tank wall and edges - a vapor recovery system that collects all VOC vapors and gases discharged from the storage vessel and a vapor return or disposal system to process the VOC vapors and gases to reduce emissions by at least 95 percent by weight - an equivalent, approved system. Verify that vessels storing petroleum liquids with a vapor pressure greater than 11.1 psia [76.5 kPa absolute] are equipped with a vapor recovery system that collects all VOC vapors and gases and a vapor return or disposal system that is designed to process the VOC vapors to reduce emissions by at least 95 percent by weight. Verify that the installation takes the following measurements: - gap measurement for primary seals of external floating roofs at least once every 5 yr - gap measurement for secondary seals of external floating roofs at least annually. Verify that the following records are kept: - gap measurement, for at least 2 yr following the date of measurement - the petroleum liquid stored, the period of storage, and the maximum true vapor pressure during the storage, unless the storage vessel has a vapor recovery and return or disposal system.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-28. Volatile organic liquid (VOL) storage vessels with a capacity of greater than or equal to 75 m^3 (≈19,800 gal) should meet specific standards (MP).	Determine the vapor pressure of the liquids stored in such vessels. (2)(4) Verify that storage vessels with a design capacity greater than or equal to 151 m^3 [≈39,890 gal] containing VOL with a vapor pressure equal to or greater than 5.2 kPa [0.75 psia], but less than 76.6 kPa [11.1 psia], or storage vessels with a capacity greater than or equal to 75 m^3 [≈19,800 gal], but less than 151 m^3 [≈39,890 gal], containing VOL that has a maximum vapor pressure equal to or greater than 5.2 kPa [0.75 psia], but less than 76.6 kPa [≈11.1 psia], are equipped with one of the following: - a fixed roof in combination with an internal floating roof - an external floating roof - a closed vent system and control device that reduces emissions by 95 percent by weight - an approved, equivalent system. Verify that storage vessels with a design capacity greater than or equal to 75 m^3 [≈19,800 gal] containing a VOL with a maximum true vapor pressure greater than or equal to 76.6 kPa [≈11.1 psia] are equipped with one of the following: - a closed vent system and control device that reduces emissions by 95 percent by weight - an approved, equivalent alternative method. Verify that the accumulated area of gaps does not exceed 212 cm^2/m [≈10 $in.^2/ft$] of tank diameter between the tank wall and the primary seal and that the width of any portion of any gap does not exceed 3.81 cm [≈2 in.]. Verify that the accumulated area of gaps does not exceed 21.2 cm^2/m [1 $in.^2/ft$] of tank diameter between the tank wall and the secondary seal and that the width of any portion of any gap does not exceed 1.27 cm [0.5 in.].
KO.1-29. VOL storage vessels with a capacity of greater than or equal to 40 m^3 (≈10,567 gal) should meet specific inspection and documentation standards (MP).	Verify that the installation inspects internal floating roofs, primary seals, and secondary seals for holes, tears, or defects before filling the tank. (2)(3)(4) Verify that the installation conducts visual inspections of the internal floating roof and primary or secondary seals of vessels with a liquid-mounted or mechanical shoe primary seal at least once every 12 mo after the initial fill. Verify that the installation either repairs vessels or removes them from service within 45 days of discovering problems. Verify that the installation inspects vessels with double-seal systems at least once every 5 yr.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-29. (continued)	Verify that the installation inspects internal floating roofs, primary seals, secondary seals, gaskets, slotted membranes, and sleeve seals each time the storage vessel is emptied and degassed. Verify that, when control equipment is installed, gap areas are measured at least: - once every 5 yr for gaps between the tank wall and the primary seal - once a year for gaps between the tank wall and the secondary seal. Verify that, for vessels with a design capacity greater than or equal to 151 m^3 [≈39,890 gal], storing a liquid with a maximum true vapor pressure greater than or equal to 3.5 kPa [0.5 psia], or with a design capacity greater than or equal to 75 m^3 [≈19,800 gal], but less than 151 m^3 [≈39,890 gal], storing a liquid with a true vapor pressure greater than or equal to 15.0 kPa [2.2 psia], the installation keeps a record of the following: - the VOL stored - the period of storage - the maximum true vapor pressure of that VOL during the storage period. (NOTE: This requirement does not apply to vessels that store a waste mixture of indefinite or variable composition or vessels equipped with a closed vent system and control device.)
FUGITIVE EMISSIONS **KO.1-30.** Installations should manage the emission of volatile hazardous air pollutants (VHAPs) in accordance with specific requirements (MP).	Determine whether the installation operates such sources in VHAP service. (2)(3) Verify that when a leak is detected: - weatherproof and readily visible identification, marked with the equipment identification number, is attached to the leaking equipment - identification is removed only after no leak has been detected for 2 mo or the leak is repaired - leaks detected for pumps, compressors, pressure-relief devices in liquid service, and flanges are recorded in a log that is maintained for 2 yr at a readily accessible location.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-30. (continued)	Verify that the following records are maintained: - a list of identification numbers of all equipment to which a standard applies - a list of equipment designated for no detectable emissions - dates of compliance tests - a list of identification numbers for equipment in vacuum service - information and data used to demonstrate that a piece of equipment is not in VHAP service. (NOTE: VHAPs include vinyl chlorides and benzene from pumps, compressors, pressure relief devices, sampling connection systems, flanges and other connectors, and product accumulator vessels operating in VHAP service.)
KO.1-31. Installations should monitor and control the emission of VHAPs from pumps in VHAP service (MP).	Determine whether the installation operates pumps in VHAP service. (2)(3) Verify that the installation visually inspects such pumps for leaks each week. Verify that the installation monitors pumps monthly for leaks, using standard test methods. Verify that leaks are repaired within 15 days of their discovery.
KO.1-32. Installations should monitor and control the emission of VHAPs from compressors in VHAP service (MP).	Determine whether the installation operates compressors in VHAP service. (2)(3) Verify that compressors are equipped with a seal system that includes a barrier fluid system and prevents leakage of process fluids. Verify that the seal system either: - operates with the barrier fluid at a pressure greater than the compressor stuffing box pressure - is equipped with a barrier fluid system connected by a closed-vent system to a control device - is equipped with a system that purges the barrier fluid into a process stream with zero VHAP emissions - contains barrier fluid that is not in VHAP service. Verify that barrier fluid systems are equipped with a sensor to detect the failure of the seal system, barrier fluid system, or both. Verify that sensors are checked daily or have an audible alarm, unless the compressor is located within the boundary of an unmanned plant site.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-33. Installations should monitor and control the emission of VHAPs from pressure relief devices, sampling connection systems, flanges and other connectors, and product accumulator vessels operating in VHAP service (MP).	Determine whether the installation operates such sources in VHAP service. (2)(3) Verify that, except during pressure releases, the pressure relief devices in gas/vapor service are operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background. Verify that, after a pressure release, the device is returned to a state of no detectable emissions within 5 days. Verify that sampling connectors are equipped with a closed-purge system or closed-vent system that either: - returns the purged process fluid directly to the process line, or - collects and recycles the purged process fluid, or - is designed and operated to capture and transport all purged process fluid to a control device. Verify that pressure relief devices in liquid service and flanges and other connectors are monitored within 5 days if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method and repaired within 15 days. Verify that product accumulator vessels are equipped with a closed-vent system capable of capturing and transporting any leakage from the vessel to a control device.
KO.1-34. Valves and lines in VHAP service should be operated according to specific procedures (MP).	Determine whether valves and lines at the installation, including those exposed to vinyl chlorides and benzene, are in VHAP service. (2)(3) Verify that open-ended valves or lines are equipped with a cap, blind flange, or second valve that seals the open end at all times, except during operations requiring process fluid flow through the valve or line. Verify that open-ended valves or lines with a second valve are operated so that the valve on the process fluid end is closed before the second valve.
KO.1-35. Systems and devices used to control VHAP emissions should be operated according to specific standards (MP).	Verify that vapor recovery systems are designed and operated to recover the organic vapors vented to them with 95 percent or greater efficiency. (2)(3) Verify that enclosed combustion devices are designed and operated to reduce the VHAP and benzene emissions vented to them with an efficiency of 95 percent or greater or provide a minimum residence time of 0.50 s at a minimum temperature of 760 °C [1400 °F].

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-35. (continued)	Verify that closed-vent systems: - have no detectable emissions - are monitored annually - have leaks repaired within 15 days of their discovery. Verify that closed-vent systems and control devices are operated at all times when emissions may be vented to them. Verify that the installation maintains in a readily accessible location the following records pertaining to closed-vent systems and control devices: - detailed schematics - dates and descriptions of any changes to the system - periods when they are not operating - dates of startups and shutdowns.
VAPOR DEGREASERS	
KO.1-36. Vapor degreasers in use after 1 January 1995 must incorporate systems that minimize the direct release of VOCs to the atmosphere (FGS-ROK, Chapter 2, Criterion 3k).	Verify that the installation uses systems such as covered or refrigerated systems to minimize direct release of VOCs to the atmosphere. (3)(4)(5)(7)(8)(9)(10)
DRY CLEANING	
KO.1-37. Petroleum solvent dry cleaning dryers, washers, filters, stills, and settling tanks at petroleum dry cleaning plants with a total manufacturer's rated dryer capacity equal to or greater than 38 kg (84 lb) should meet specific operating standards (MP).	Verify that installation dryers are solvent recovery dryers. (2)(3) Verify that the petroleum solvent filters are cartridge filters that are drained in their sealed housing for at least 8 h before their removal. Verify that a clearly visible label regarding fire protection and inspection is posted on the dryer.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
CFCs AND HALONS	
KO.1-38. Installations must meet specific standards during the servicing of equipment that contains CFCs or halons (FGS-ROK, Chapter 2, Criteria 3j(2) and 3j(3)).	Verify that all repairs or service to nontactical vehicle air-conditioners use commercially available refrigerant recycling equipment, operated by trained personnel. (5)(7)(8) Verify that no activity intentionally vents any Class I or Class II CFC refrigerant in the process of maintaining, servicing, repairing, or disposing of an appliance or industrial process refrigeration unit. (NOTE: See Table 1-2 for a list of Class I and Class II substances.)
KO.1-39. In order to minimize atmospheric emissions of ODSs, specific practices should be instituted at the installation (MP).	Verify that ODSs are procured only in the absence of suitable alternatives. Verify that there is no disposal of ODS by direct release to the atmosphere. Verify that ODSs are recycled.
KO.1-40. Installations must maximize the recycling of ozone depleting refrigerants during equipment servicing or disposal (FGS-ROK, Chapter 2, Criterion 3j(4)).	Verify that service practices are used that maximize recycling of ozone depleting refrigerants on evacuation of refrigerant during servicing or disposal of equipment.
KO.1-41. Installations must develop a plan for the removal of CFCs from air-conditioning and refrigeration systems (FGS-ROK, Chapter 2, Criterion 3j(5)).	Verify that the installation has a suitable plan for the removal of CFCs from air-conditioning and refrigeration systems. (NOTE: Refer to Table 1-8 for phaseout goals and removal deadlines.) (NOTE: First priority should be given to large systems that are prone to leakage (e.g., chillers and built-up refrigeration), followed by smaller systems that can be kept in service until they fail (e.g., ice machines and water coolers).)

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.1-42. Installations must replace certain refrigerants in air-conditioners or refrigeration systems or replace the equipment itself (FGS-ROK, Chapter 2, Criterion 3j(6)).	Verify that CFC refrigerants R-11, R-12, and R-502 are replaced with R-22, R-123, R-134a, or an approved equivalent. (NOTE: Air-conditioners that use R-11 can be converted to R-123 or an approved equivalent, and those that use R-12 can be converted to R-134a or an approved equivalent.) Verify that air-conditioners in which R-113 is used are replaced. (NOTE: It is possible to convert R-12 to R-134a in refrigeration systems.) Verify that refrigeration systems in which R-502 is used are replaced.

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Table 1-1

Air Pollutants and Special Hazardous Air Pollutants

(FGS-ROK, Chapter 2, Definitions)

Air Pollutants	
Particulate matter	Phosphorus and its compounds
Bromine and its compounds	Boron and its compounds
Aluminum and its compounds	Aldehyde
Vanadium and its compounds	Benzene
Manganese and its compounds	Styrene
Iron and its compounds	Acrolein
Zinc and its compounds	Cadmium and its compounds
Selenium and its compounds	Cyanide
Antimony and its compounds	Lead and its compounds
Tin and its compounds	Chromium and its compounds
Tellurium and its compounds	Arsenic and its compounds
Barium and its compounds	Mercury and its compounds
Carbon monoxide	Copper and its compounds
Ammonia	Chlorine and its compounds
Nitric oxide	Fluoride
Sulfur dioxide	Asbestos
Hydrogen sulfide	Nickel and its compounds
Methyl sulfide	Vinyl chloride
Mercaptans	Dioxane
Amines	Phenol and its compounds
Carbon tetrachloride	Beryllium and its compounds
Carbon disulfide	VOCs
Hydrocarbon	Polychlorinated Biphenyls (PCBs)

(continued)

Table 1-1 (continued)

Special Hazardous Air Pollutants	
Cadmium and its compounds	Hydrogen cyanide
Lead and its compounds	Arsenic and its compounds
Chromium commands	Copper and its compounds
Mercury and its compounds	Fluoride
Chlorine and hydrogen chloride	Nickel and its compounds
Asbestos	Dioxin
Vinyl chloride	Beryllium and its compounds
Phenol and its compounds	

Table 1-2

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

Class I	Class II
CFC-11	HCFC-21
CFC-12	HCFC-22
CFC-13	HCFC-31
CFC-111	HCFC-121
CFC-112	HCFC-122
CFC-113	HCFC-123
CFC-114	HCFC-124
CFC-115	HCFC-131
CFC-211	HCFC-132b
CFC-212	HCFC-133a
CFC-213	HCFC-141b
CFC-214	HCFC-142b
CFC-215	HCFC-221
CFC-216	HCFC-222
CFC-217	HCFC-223
HALON-1211	HCFC-224
HALON-1301	HCFC-225ca
HALON-2402	HCFC-225cb
Carbon Tetrachloride	HCFC-226
Methyl Chloroform	HCFC-231
HCFC 22B1	HCFC-232
Methyl Bromide	HCFC-233
	HCFC-234
	HCFC-235
	HCFC-241
	HCFC-242
	HCFC-243
	HCFC-244
	HCFC-251
	HCFC-252
	HCFC-253
	HCFC-261
	HCFC-271

Table 1-3

Permissible Standards of Air Pollutant Emission Gaseous Pollutants

(FGS-ROK Table 2-4)

Air Pollutant	Emitting Facility	Phase in Periods		
		Until 31 December 1994	1 January 1995 - 31 December 1998	From 1 January 1999
Carbon Monoxide (CO)	a. electricity or steam generating units			
	1. facility using solid fuel	350 ppm or less (4)	350 ppm or less (4)	350 ppm or less (4)
	2. facility using liquid fuel	400 ppm or less (6)	400 ppm or less (6)	400 ppm or less (6)
	b. incinerators	600 ppm or less (12)	600 ppm or less (12)	600 ppm or less (12)
Sulfur Dioxide (SO_2)	a. steam generating unit			
	1. facility using solid fuel			
	a. area using low sulfuric oil	850 ppm or less (4)	540 ppm or less (4)	540 ppm or less (4)
	b. other area	1950 ppm or less (4)	1950 ppm or less (4)	540 ppm or less (4)
	2. facility using solid fuel (including mixing liquid fuel)			
	a. area restricted for using solid fuel	500 ppm or less (6)	250 ppm or less (6)	250 ppm or less (6)
	b. other area			
	1. facility using domestic producing coals	1200 ppm or less (6)	700 ppm or less (6)	500 ppm or less (6)
	2. facility using other solid waste	700 ppm or less (6)	500 ppm or less (6)	250 ppm or less (6)
Nitrogen Peroxide (NO_2)	a. facility using liquid fuel			
	1. electrically generating motor	1400 ppm or less (13)	1400 ppm or less (13)	950 ppm or less (13)
	2. other facility	250 ppm or less (4)	250 ppm or less (4)	250 ppm or less (4)
	b. facility using solid fuel	350 ppm or less (6)	350 ppm or less (6)	350 ppm or less (6)
	c. facility using gaseous fuel (only for electricity generating facility)			
	1. generating motor	1200 ppm or less (13)	950 ppm or less (13)	950 ppm or less (13)
	2. other generating facility	400 ppm or less	400 ppm or less	400 ppm or less

(continued)

Table 1-3 (continued)

Air Pollutant	Emitting Facility	Phase in Periods		
		Until 31 December 1994	1 January 1995 - 31 December 1998	From 1 January 1999
	d. other facility	200 ppm or less	200 ppm or less	200 ppm or less
Formalde-hyde (HCHO)		20 ppm or less	20 ppm or less	20 ppm or less
Fluorine (F) compound		5 ppm or less	3 ppm or less	3 ppm or less
Hydrogen Cyanide (HCN)		10 ppm or less	10 ppm or less	10 ppm or less
Bromine (Br) compound		5 ppm or less	5 ppm or less	5 ppm or less
Benzene (C_6H_6) compound		50 ppm or less	50 ppm or less	50 ppm or less
Phenol ($C_6H_5O_6$) compound		10 ppm or less	10 ppm or less	10 ppm or less
Mercury (Hg) compound		5 mg/Sm^3 or less	5 mg/Sm^3 or less	5 mg/Sm^3 or less
Arsenic (Ar) compound		3 ppm or less	3 ppm or less	3 ppm or less

NOTE: Numbers in ( ) show the percentage of standard oxygen density (% of O_2).

Table 1-4

NO_x Emission Limits for New or Substantially Modified Electric Steam Generating Units

(FGS-ROK 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

Table 1-5

Performance Standards
(40 CFR 60)

Source Category	Fuel Type	Pollutant	Emission Level	Monitoring Requirement
40 CFR 60, Subpart D:				
Steam generators* (> 250 MBtu/h) constructed or modified after 8/17/71	Solid Fossil Fuel	Particulate Opacity SO_2 NO_x (except lignite and coal refuse)	0.10 lb/MBtu 20%; 27% 6 min/h 1.20 lb/MBtu 0.70 lb/MBtu	None Continuous Continuous Continuous
	Liquid Fossil Fuel	SO_2 NO_x	0.80 lb/MBtu 0.30 lb/MBtu	Continuous Continuous
	Gaseous Fossil Fuel	NO_x	0.20 lb/MBtu	Continuous
	Lignite	NO_x	0.60 lb/MBtu	Continuous
	Lignite mined in ND, SD, or MT, burned in a cyclone fired unit	NO_x	0.80 lb/MBtu	Continuous
40 CFR 60, Subpart E:				
Incinerators (> 50 tons/day) constructed or modified after 8/17/71	Incinerators	Particulate CO_2	0.08 gr/dscf** corrected to 12% CO_2	Record of daily charging rates and hours of operation

* Does not include electric utility steam generating units that started construction or modification after 18 September 1978.

** gr/dscf - grains per dry standard cubic foot.

Table 1-6

Municipal Waste Combustor Operating Standards for CO

(40 CFR 60.56a Table I)

Municipal Waste Combustor Technology	Emission Limit (ppm by volume)
Mass burn waterwall	100
Mass burn refractory	100
Mass burn rotary waterwall	100
Modular starved air	50
Modular excess air	50
Refuse derived fuel (RDF) stoker	150
Bubbling fluidized bed combustor	100
Circulating fluidized bed combustor	100
Coal/RDF mixed fuel fired combustor	150

Table 1-7

Permissible Standards for Air Pollutant Emission from Operating Automobiles

(FGS-ROK Table 2-6)

Fuel Used	Type of Vehicle	Carbon Monoxide	Hydrocarbon from Exhaust Pipe	Smoke
Gasoline	passenger automobile	1.2% or less	220 ppm or less	---
LPG	passenger automobile	1.2% or less	400 ppm or less	---
Gasoline/LPG	light-duty, small-freight, heavy-duty automobiles	4.5% or less	1200 ppm or less	---
Diesel/JP-8	passenger, small-freight, heavy-duty automobiles	---	---	40% or less

Types of Automobiles

1. Light Duty Automobiles:
   - automobiles for a very small number of passengers or small amount of freight
   - engine size (emission): less than 800 cc.
2. Passenger Automobiles:
   - ordinary passenger automobiles
   - engine size (emission): 800 cc or larger
   - weight: less than 3 tons [≈2.72 metric tons].
3. Small Freight Automobiles:
   - ordinary freight automobiles
   - engine size (emission): 800 cc or larger
   - weight: less than 3 tons [≈2.72 metric tons].
4. Heavy Duty Automobiles:
   - automobiles for a very large number of passengers or large amount of freight
   - weight: 3 tons [≈2.72 metric tons] or larger.
5. Two Wheel Automobiles:
   - automobiles with two wheels for one or two passengers
   - engine size (emission): 50 cc or larger
   - weight: less than 0.5 ton [≈0.45 metric tons].

NOTES:

1. Passenger automobiles include wagons.
2. Small freight automobiles include jeeps, coaches, and vans.
3. The types of special equipment that are included in the heavy duty automobiles will be specified by the Minister of Environment.
4. Two wheel automobiles include two wheel passenger side cars.

Table 1-8

Department of Defense Goals for Reduction Releases, Procurement, and Use of Ozone-Depleting Substances

(FGS-ROK Table 2-3)

	Phase I	Phase II	Phase III	Phase IV	Phase V
	Institute plans to reduce unnecessary releases during operation, maintenance, and training.	Institute plans to eliminate procurement and use.	Stop use in new procurements.	Phaseout of current applications to 50 percent of 1986 levels.	Reduce use in all applications to zero.
Goals for CFCs					
	Phase I	Phase II	Phase III	Phase IV	Phase V
Category III	October 90	October 92	October 96	October 96	October 2000
Category II	October 90	October 93	October 97	October 97	October 2000*
Category I	October 90	October 93	October 98	October 98	Upon available substitutes.
Goals for Halons					
	Phase I	Phase II	Phase III	Phase IV	Phase V
Category III	October 90	October 90	October 90		October 95
Category II	October 90	October 90	October 90	October 95	October 2000*
Category I	October 90	October 90	October 95	October 95	Upon available substitutes.

* Meet requirement from recycle or inventory.

(NOTE: All phaseout goals are dependent on development of suitable substitutes for ozone-depleting substances in a timely manner. To prevent interruption of supplies for mission critical uses (Category I), these uses will be identified and plans initiated not later than October 1990 to recycle existing stocks and initiate stockpiling of sufficient quantities of ozone-depleting substances to allow operation for the useful life of the weapons system.)

Category I: Mission-Critical Uses

The highest priority uses will be those that are mission critical. Mission-critical uses have a direct impact on combat mission capability and include uses that are integral to combat mission assets or affect operability of these assets. Mission-critical uses include cooling operational suppression systems in tactical vehicle crew compartments to protect the lives of mission-critical personnel.

Category II: Essential Uses

Essential uses include those applications that have a direct impact on combat mission assets and

(continued)

play an auxiliary role in ensuring the operability of those assets. Essential uses include process cooling applications and charging portable fire extinguishers for electronic area protection.

Category III: Nonessential Uses

This category includes all nonessential uses. Nonessential uses include uses for comfort cooling in family housing and installation support activities.

INSTALLATION:	COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 2

CULTURAL RESOURCES MANAGEMENT

Korea ECAMP

SECTION 2

CULTURAL RESOURCES MANAGEMENT

A. Applicability of this Section

This chapter, relevant to all Air Force (AF) installations, includes plans and programs needed to ensure proper protection and management of cultural resources (which includes historic and prehistoric properties under Department of Defense (DOD) control), and properties on the World Heritage List or on the host nation's list equivalent to the U.S. National Register of Historic Places.

The regulatory requirements in this section are based on DOD regulations and Air Force Instructions (AFIs) that apply at overseas installations. Management Practices (MPs) are derived from DOD regulations and other documents that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 12 contains criteria for required plans and programs needed for the protection and management of cultural resources (including historic and prehistoric properties) located within the U.S. Forces - Korea (USFK) territories and listed on the Korea or World Heritage List. The purpose is to preserve and protect buildings, structures, sites, and objects of historical, architectural, archaeological, or cultural value on USFK-controlled property and in maneuver rights areas. Specifically, this section advises on the issues of orders for restriction or prohibition of certain actions, for the establishment of specified cultural properties, for excavation of buried cultural properties, etc.

C. U.S. Air Force Documents

- AFI 32-7062, *Air Force Comprehensive Planning*, 18 April 1994, requires installations to comply with the specifications contained in the Master Statement of Work, the AF document that provides specific details regarding the structure, content, symbology, and other guidance for preparing AF comprehensive plan documents, maps, and databases. The Master Statement of Work (developed by the Air Force Center for Environmental Excellence (AFCEE)) requires that installations maintain maps that address specific environmental issues, including natural and cultural resources issues.

- The *National Historic Preservation Act* of 1966 (16 U.S. Code (USC) 470a-2) requires Installation Commanders (ICs) to inform the Secretary of the AF of property listed on the host nation's equivalent of the U.S. National Register prior to approval of any Federal undertaking that may directly and adversely affect such property.

D. Responsibility for Compliance

- Base Civil Engineering (BCE) is responsible for funding, supervising, controlling, and managing installation historic preservation programs.

- The Base Cultural Resources Manager is responsible for implementing the historic preservation program, and for locating, inventorying, and evaluating installation cultural resources. This is usually an additional duty assignment within BCE.

E. Definitions

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, on USFK-controlled installations (FGS-ROK, Chapter 12, Definitions).

- *Adverse Effect* - changes that diminish the quality or significant value of archaeological resources, or cultural resources or properties (FGS-ROK, 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-ROK, Chapter 12, Definitions).

- *Buried Cultural Property* - a cultural property that was buried or discovered under the land, on the sea bottom, or at a construction site (FGS-ROK, Chapter 12, Definitions).

- *Cultural Mitigation* - specific steps designed to lessen the adverse effects of a USFK action on a cultural or archeological resource, including (FGS-ROK, 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 Properties* - any of the following (FGS-ROK, Chapter 12, Definitions):
  1. Tangible Cultural Properties: buildings, classical books, calligraphic ancient documents, painting, sculptures, industrial art objects, etc., and other tangible cultural products that possess high historic or artistic value and other archaeological specimens which belong to the categories above
  2. Monuments: shell-mound, ancient tombs, castle sites, palace sites, pottery remains, layers containing remains, etc., and other sites of historical remains that possess high artistic or ornamental values, and animals (including places of habitat, breeding, and migration), plants (including habitat), minerals and caves that have high scientific value.

- *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-ROK, Chapter 12, Definitions).

- *Designated Cultural Properties* - any of the following (FGS-ROK, Chapter 12, Definitions):
  1. National Designated Cultural Properties: cultural properties that are designated by the Minister of Culture
  2. City/Province Designated Cultural Properties: cultural properties that are not National Designated Cultural Properties but are deemed worthy of preservation and that are designated by

the Mayor of Seoul Special City, the Mayor of the city under the direct control of the Government, or the Governor of the province that has jurisdiction over the property.

- *Inventory* - to determine the location of cultural resources that may have world, national, or local significance (FGS-ROK, Chapter 12, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *National Treasure* - cultural properties chosen by the Minister of Culture after consultation by the Committee on Cultural Properties that are rare and of great value from the standpoint of human culture but are not designated as "Treasures." (FGS-ROK, Chapter 12, Definitions).

- *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-ROK, Chapter 12, Definitions).

- *Property* - a site, building, object, structure, or collection of such items (FGS-ROK, 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-ROK, Chapter 12, Definitions).

- *Treasure* - an especially important tangible cultural property as designated by the Minister of Culture after consultation by the Committee on Cultural Properties (FGS-ROK, Chapter 12, Definitions).

CULTURAL RESOURCES MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.2-1 through KO.2-5	(1)(2)
Cultural Resources Management	KO.2-6 through KO.2-13	(1)

(a) CONTACT/LOCATION CODE:

(1) Cultural Resources Manager (or Environmental Coordinator)
(2) Base Staff Judge Advocate

CULTURAL RESOURCES MANAGEMENT

Records To Review

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

Physical Features To Inspect

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

People To Interview

- Cultural Resources Manager (or Environmental Coordinator)
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: CULTURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ALL INSTALLATIONS	
KO.2-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.2-2. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (2) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 32-7062, *Air Force Comprehensive Planning*, 18 April 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.2-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning cultural resources have been issued since the finalization of the manual. (1)(2) Verify that the installation is in compliance with newly issued regulations.
KO.2-4. The installation Cultural Resources Manager should be included in the coordination process for all actions that may affect the installation's cultural resources (MP).	Verify that the Cultural Resources Manager is included in the coordination process for all actions that may affect the installation's cultural resources. (1)

KO.2-5. Installations must develop base environmental maps that address particular topics (AFI 32-7062, para 2.4).	Verify that the installation is developing the following maps: (1)
	- Map A: Natural and Cultural Resources
	  - Map A-1: Areas of Critical Concern
	  - Map A-2: Management Areas
	- Map B: Environmental Quality
	  - Map B-1: Environmental Regulatory Issues
	  - Map B-2: Environmental Emission Sources.

(1) Cultural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

COMPLIANCE CATEGORY: CULTURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.2-5. (continued)	(NOTE: These maps are specified in the Master Statement of Work developed by AFCEE.)
CULTURAL RESOURCES MANAGEMENT	
KO.2-6. Installations must inventory cultural property and archaeological resources in areas under USFK control, if financially and otherwise practical (FGS-ROK, Chapter 12, Criteria 3b and 3f).	Verify that, if financially and otherwise practical, the installation inventories cultural property and archaeological resources in areas under USFK control. (1) (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 USFK control.
KO.2-7. Installations must ensure that planning for major actions includes consideration of possible effects on cultural or archaeological property or resources (FGS-ROK, Chapter 12, Criterion 3i).	Verify that the installation's planning for major actions includes consideration of possible effects on cultural or archaeological property or resources. (1)
KO.2-8. ICs have specific responsibilities with regard to properties on the host nation's equivalent of the United States' National Register (16 USC 470a-2, Section 402).	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. (1) Verify that the IC informs the Secretary of the Air Force (SAF/MIQ) of such property. (NOTE: This notification is to be made so that the Secretary of the Air Force 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.

(1) Cultural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

COMPLIANCE CATEGORY: CULTURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.2-9. Installations must notify ROK officials of the discovery of any potential cultural property or resources or archaeological resources not previously inventoried that are discovered in the course of a USFK action (FGS-ROK, Chapter 12, Criterion 3k).	Determine whether any potential cultural property or resources or archaeological resources not previously inventoried have been discovered. (1) Verify that appropriate ROK officials are notified of the discovery of potential cultural or archaeological resources. (NOTE: This requirement is qualified with the word "normally.")
KO.2-10. Installations must preserve and protect certain newly discovered items pending a decision on final disposition by the IC (FGS-ROK, Chapter 12, Criterion 3j).	Verify that the installation preserves and protects potential cultural property or resources or archaeological resources that have not previously been inventoried if they are discovered in the course of a USFK action. (1)
KO.2-11. Installations must develop a plan for the protection and preservation of cultural resources (FGS-ROK, Chapter 12, Criterion 3c).	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. (1) (NOTE: If it is recognized as necessary for protection of cultural properties during a war, disaster, or other national emergency, the Minister of Culture may take actions, consistent with the Status of Forces Agreement (SOFA) process, for necessary measures such as burying or moving the cultural properties and designated cultural properties into a safe area or ordering the owner, occupant, or manager of the cultural properties to bury or move them. In those cases, the owner, occupant, or manager of the cultural properties must not deny, disturb, or avoid the order.)
KO.2-12. Personnel who perform cultural or archaeological resource functions must have the required expertise in world, national, and local history and culture (FGS-ROK, Chapter 12, Criterion 3a).	Verify that personnel who perform cultural or archaeological resource functions have the requisite expertise in world, national, and local history and culture. (1)

(1) Cultural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

COMPLIANCE CATEGORY: CULTURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.2-13. Installations must establish measures sufficient to protect known cultural property or archaeological resources until appropriate mitigation or preservation can be completed (FGS-ROK, Chapter 12, Criteria 3d, 3e, 3g, and 3h).	Verify that known cultural property or archaeological resources are protected at the installation. (1) Verify that the installation has established measures sufficient to: - prevent excavation or disturbance of cultural properties, including areas known to contain buried or submerged historic properties - prevent USFK personnel from disturbing or removing archaeological resources without the permission of the Republic of Korea. Verify that the installation prevents cultural property, such as a national treasure, treasure, or important folk-lore property, from being exported or carried out of Korea. (NOTE: Persons who have an advanced permit from the Minister of Culture for the purpose of international cultural exchange may be exempted from this requirement.)

(1) Cultural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

INSTALLATION:	COMPLIANCE CATEGORY: CULTURAL RESOURCES MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 3

HAZARDOUS MATERIALS MANAGEMENT

Korea ECAMP

SECTION 3

HAZARDOUS MATERIALS MANAGEMENT

A. Applicability of this Section

Most Air Force (AF) installations handle many chemicals and substances that may be considered hazardous if not handled, stored, or used properly. A complete list of chemicals used at AF installations would be too lengthy to include in this section, but many of the materials are hazardous, i.e., toxic chemicals, flammable substances, reactive substances, and corrosive materials.

This section primarily addresses the proper storage and handling of chemicals and the spill contingency and response requirements related to hazardous materials. Oil, pesticides, and asbestos are hazardous materials that require special management practices at AF installations and are addressed in separate sections. Radioactive substances and the general category of hazardous wastes are also not included in this section of the manual, and it does not focus on individual hazardous chemicals or substances used at AF installations. It deals, instead, with the generic requirements and Management Practices (MPs) associated with minimizing impacts on the environment from spills or releases of hazardous materials as a result of improper storage and handling. As a general rule, most subsections of this section will be applicable to most AF installations.

The regulatory requirements in this section are based on Department of Defense (DOD) Regulations, Air Force Occupational Safety and Health Standards (AFOSH STD), and Air Force Regulations (AFRs) and Air Force Instructions (AFIs) that apply at overseas installations. MPs are derived from U.S. Environmental Protection Agency (USEPA) regulations and National Fire Protection Association (NFPA) publications that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and to protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 5, contains criteria for the storage, handling, and disposition of hazardous materials used by U.S. Forces - Korea (USFK) installations.

- DOD 4145.19-R-1, *Storage and Materials Handling*. Chapter 5, Section 4, *Hazardous Commodities*, dated September 1979, addresses the storage and handling of compressed gases and other hazardous commodities.

- DOD Directive (DODD) 6050.8, *Storage and Disposal of Non-DOD Owned Hazardous or Toxic Materials on DOD Installations*, dated 27 February 1986, does not allow the storage of non-DOD owned toxic or hazardous materials onsite.

C. U.S. Air Force Documents

- Air Force Manual (AFM) 67-1, *Storage and Related Operations*, requires that the installation have a comprehensive list of all chemicals used or generated onsite.

- AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Prevention, and Health (AFOSH) Program.* This AFI, dated 19 May 1994, outlines the Air Force's Occupational and Environmental Safety, Fire Prevention, and Health Program. It specifically requires the Bioenvironmental Engineering Services (BES) to maintain material safety data sheets (MSDSs) and other related information.

- AFOSH STD 127-43, *Flammable and Combustible Liquids*, 21 September 1980, applies to the storage, use, and handling of flammable and combustible liquids in containers or tanks of 60 gal [≈227 L] or less and in portable tanks of up to 660 gal [≈2498 L] capacity. The standard implements those portions of Title 29, Code of Federal Regulations (29 CFR) 1910.106, *Flammable and Combustible Liquids*, that are applicable to AF operations. In addition, it covers several items not addressed in the Occupational Safety and Health Administration (OSHA) standard.

- AFOSH STD 161-21, *Hazard Communication*, 23 January 1989, contains minimum requirements for an effective hazard communication program for activities that handle or use hazardous materials. It implements 29 CFR 1910.1200, *Hazard Communication.*

D. Responsibility for Compliance

- Base Supply (Logistics) has primary responsibility for receiving, storing, and issuing all hazardous commodities. Base Supply reviews all items that have a potential health hazard and determines if an issue exception code should be assigned to the item before being placed in storage. The receipt of hazardous materials with the proper documentation and shipping papers is also the responsibility of Base Supply. The proper maintenance and operation of flammable/combustible materials storage facilities, acid storage facilities, and compressed gas storage facilities is also the responsibility of Base Supply.

- The Director of Base Medical Services, through the BES, is responsible for reviewing the issue exception codes for hazardous materials assigned by Base Supply and for approving or disapproving the recommendations.

- The Base Civil Engineer (BCE) is responsible for the storage and handling of all hazardous materials used by the civil engineering shops.

- The Base Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department is responsible for making periodic fire safety inspections of flammable/combustible storage and handling areas on the installation.

- The Base Safety Manager is responsible for conducting workplace safety evaluations and inspections of the handling and storage of hazardous materials. The Safety Manager provides the appropriate manager with a report of findings and recommended corrective actions. He or she is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.

E. Definitions

- *Combustible Liquid* - a liquid having a flashpoint at or above 100 °F (37.8 °C). Combustible liquids are categorized as Class II or Class III liquids and are further subdivided as follows (AFOSH STD 127-43, para 2f):
  1. Class II liquids are those having a flashpoint at or above 100 °F (37.8 °C) and below 140 °F (60 °C)
  2. Class IIIA liquids are those having flashpoints at or above 140 °F (60 °C) and below 200 °F (93.3 °C), except any mixture having components with flashpoints of 200 °F (93.3 °C)
  3. Class IIIB liquids are those having flashpoints at or above 200 °F (93.4 °C).

- *Flammable Liquid* - a liquid with a flashpoint below 100 °F (37.8 °C) with a vapor pressure not exceeding 40 psia at 100 °F (37.8 °C). Flammable liquids are categorized as Class I liquids, and are further subdivided as follows (AFOSH STD 127-43, para 2i):
  1. Class IA are those that have a flashpoint below 73 °F (22.8 °C) and boiling point below 100 °F (37.8 °C).
  2. Class IB are those that have flashpoints below 73 °F (22.8 °C) and boiling points at or above 100 °F (37.8 °C).
  3. Class IC are those that have flashpoints at or above 73 °F (22.8 °C) and below 100 °F (37.8 °C).

- *Hazardous Chemical Warning Label* - a label, tag, or marking on a container that is prepared in accordance with DOD 6050.5-H, *DOD Hazardous Chemical Warning Labeling System,* and that provides the following information (FGS-ROK, 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, or the material is listed in Table 4-1, Chart A.4 of Section 4, *Hazardous Waste Management.* Munitions are excluded (FGS-ROK, 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 DOD (FGS-ROK, Chapter 5, Definitions).

- *Hazardous Material Shipment* - any movement of hazardous material in a USFK 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-ROK, Chapter 5, Definitions):
  1. for hazardous material identified as a result of inclusion in Table 4-1, Chart A.4, any quantity in excess of the reportable quantity listed in Table 4-1, Chart A.4
  2. for other liquid or semi-liquid hazardous material, in excess of 410 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 reportable quantity. A listing of these substances and corresponding reportable quantity is contained in Table 4-1, Chart A.4. The term does not include (FGS-ROK, 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).

- *High Pressure Gas* - one of the following (FGS-ROK, Chapter 5, Definitions):
    1. compressed gas whose pressure (gauge pressure) is 10 kg/cm^2 or more at the normal temperature of 35 °C [≈95 °F]

    (NOTE: Acetylene gas must be more than 0 kg/cm^2 at normal temperature. That is, acetylene at any pressure is treated as a high pressure gas.)

    2. liquefied gas whose pressure (gauge pressure) is 2 kg/cm^2 or more at normal temperature of 35 °C [≈ 95 °F].

    (NOTE: Liquefied hydrogen cyanide, liquefied methane bromide, and liquefied ethylene oxide must be 0 kg/cm^2 of pressure at normal temperature. That is, these gases at any pressure are treated as high pressure gas.)

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *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-ROK, Chapter 5, Definitions).

- *Special High Pressure Gas* - hydrogen, oxygen, liquefied ammonia, acetylene, or liquefied chlorine (FGS-ROK, Chapter 5, Definitions).

- *Special Toxic Substances* - toxic substances that are extremely harmful, listed in Table 3-1 (FGS-ROK, Chapter 5, Definitions).

- *Toxic Substances* - those chemical substances that are harmful to public health or the environment, listed in Table 3-2 (FGS-ROK, Chapter 5, Definitions).

HAZARDOUS MATERIALS MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.3-1 through KO.3-3	(2)(8)
General	KO.3-4 through KO.3-11	(1)(2)(3)(4)(5)
Documentation	KO.3-12 through KO.3-19	(1)(2)(3)(4)(5)(6)(7)
Flammable/Combustible Liquids		
Handling	KO.3-20	(1)(2)(4)
Storage	KO.3-21 through KO.3-37	(1)(2)(4)(5)
Industrial Storage Areas	KO.3-38 through KO.3-40	(1)(2)(4)(5)
Bulk Storage		
Compressed Gases	KO.3-41 through KO.3-43	(1)(2)(4)(5)
Acids	KO.3-44 and KO.3-45	(1)(2)(4)(5)
Use of High Pressure Gas	KO.3-46 and KO.3-47	(4)
Transportation	KO.3-48 through KO.3-51	(2)(4)(5)(7)
Training	KO.3-52	(1)(2)(3)(4)(5)(6)(7)
Releases	KO.3-53 through KO.3-55	(2)(3)(4)(6)

(a) CONTACT/LOCATION CODE:

(1) Logistics Supply (LGS (Base Supply))
(2) BCE (Base Civil Engineering)
(3) Fire Department
(4) Safety Officer
(5) BES (Bioenvironmental Engineering Services)
(6) Disaster Preparedness Office
(7) LGT (Transportation Officer)
(8) Base Staff Judge Advocate

HAZARDOUS MATERIALS MANAGEMENT

Records To Review

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

Physical Features To Inspect

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

People To Interview

- LGS (Base Supply)
- BCE (Base Civil Engineering)
- Fire Department
- Safety Officer
- BES (Bioenvironmental Engineering Services)
- Disaster Preparedness Office
- LGT (Transportation Officer)
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ALL INSTALLATIONS	
KO.3-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (2)
KO.3-2. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (2)(8) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - DOD 4145.19-R-1, Chapter 5, Section 4, *Hazardous Commodities*, September 1979 - DODI 6050.5-H, *DOD Hazardous Chemical Warning Label System*, June 1989 - DODD 6050.8, *Storage and Disposal of Non-DOD Owned Hazardous or Toxic Materials on DOD Installations*, 27 February 1986 - AFM 67-1, Vol. 2, Part Two, Chapter 14, *Storage and Related Operations* - AFM 67-1, Vol. 2, Part Two, Chapter 21, *Special Logistical Support Procedures* - AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Prevention, and Health (AFOSH) Program*, 19 May 1994 - AFOSH STD 127-43, *Flammable and Combustible Liquids*, 21 September 1980 - AFOSH STD 161-21, *Hazard Communication*, 23 January 1989 - International Air Transportation Association rules (if necessary) - International Maritime Organization rules (if necessary). Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.3-3. Installations must meet regulatory and AF requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning hazardous materials have been issued since the finalization of the manual. (2)(8) Verify that the installation is in compliance with newly issued regulations.

(1) LGS (Base Supply) (2) BCE (Base Civil Engineering) (3) Fire Department (4) Safety Officer (5) BES (Bioenvironmental Engineering Services) (6) Disaster Preparedness Office (7) LGT (Transportation Officer) (8) Base Staff Judge Advocate

COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
GENERAL	
KO.3-4. Installations must reduce the use of hazardous materials through resource recovery, recycling, source reduction, acquisition, or other minimization strategies (FGS-ROK, Chapter 5, Criterion 3i).	Verify that the installation has a Hazardous Materials Minimization Program and that it addresses hazardous material management through the use of: (2)(4)(5) - resource recovery - recycling - source reduction - acquisition, etc. (NOTE: Installations are encouraged to develop and implement a pollution prevention (PP) program addressing hazardous materials, including toxic chemicals as defined under Executive Order 12856.)
KO.3-5. Installations should arrange for coordination with the fire department concerning the types of hazardous chemicals used at the installation, the areas where they are used, what they are used for, and the quantities used in a given operation (MP).	Verify that the fire department is aware of areas that are at high risk for chemical incidents. (3)
KO.3-6. Installations must not allow the storage of non-DOD-owned toxic or hazardous materials onsite (DODD 6050.8, para D).	Verify that the installation does not allow the storage of non-DOD-owned toxic or hazardous materials onsite. (1)(2)(5) (NOTE: This does not apply to: - agreements with the General Services Administration (GSA) for storage of strategic and critical materials in the National Stockpile Program - agreements between DOD Components and other Federal agencies for temporary storage or disposal of explosives - emergency lifesaving assistance to civil authorities involving temporary storage or disposal of explosives - excess explosives generated under a DOD contract - arrangements with the Department of Energy (DOE) for the temporary storage of nuclear materials or nonnuclear classified materials - military resources used during peacetime civil emergencies - assistance and refuge for commercial carriers containing material of other Federal agencies during transportation emergencies.)

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-7. Specific persons should be designated responsible for hazardous materials storage areas, and the precise nature of their responsibilities should be specified (MP).	Verify that specific individuals have been designated responsible for hazardous materials storage areas. (2)(5) Verify that the individuals designated responsible for hazardous materials storage areas are aware of the precise nature of their responsibilities.
KO.3-8. Installations must prevent the unauthorized entry of people or livestock into hazardous materials storage areas (FGS-ROK, Chapter 5, Criterion 3L).	Verify that the installation prevents unauthorized entry into hazardous materials storage areas. (2)(4)
KO.3-9. Installations must maintain hazardous materials dispensing areas properly (FGS-ROK, Chapter 5, Criterion 3b).	Verify that drums and containers in hazardous materials dispensing areas are not leaking. (2)(4) Verify that drip pans/absorbent materials are placed under containers as needed in order to collect drips or spills. Verify that container contents are clearly marked in accordance with Department of Transportation (DOT) requirements and the requirements of this section and Section 4, *Hazardous Waste Management.* (NOTE: Placards and labels available through supply channels are identified in Table 3-3.) Verify that dispensing areas are located away from catch basins and storm drains.
KO.3-10. All hazardous materials that cannot be reused (including less critical operations), recycled, or recovered on the USFK installation must be processed through the Defense Reutilization and Marketing Service (DRMS) (FGS-ROK, Chapter 5, Criterion 3j).	Verify that excess hazardous materials are processed through DRMS. (1)(2)(4)(5) (NOTE: DRMS will donate, transfer, or sell hazardous material to environmentally responsible parties only.)

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-11. Lead-acid batteries that are to be recycled must be treated as hazardous material (FGS-ROK, Chapter 6, Criterion 3i(4)).	Verify that lead-acid batteries that are to be recycled are treated as hazardous material. (2)
DOCUMENTATION	
KO.3-12. The installation must have a comprehensive list of all chemicals used or generated onsite and an assessment of their hazards (AFM 67-1, Volume 2, Part Two, Chapters 14 and 21).	Verify that the installation has a comprehensive list of all chemicals used or generated onsite and an assessment of their hazards. (1)(2)(3)(4)(5)
KO.3-13. Installations must maintain a master listing of all storage facilities for hazardous materials and an inventory of all hazardous materials contained therein (FGS-ROK, Chapter 5, Criterion 3e).	Verify that the installation maintains a master listing of all storage facilities for hazardous materials and the hazardous materials contained therein. (1)(4)
KO.3-14. Installations must ensure that the most current MSDS data is available for all hazardous materials on the installation (FGS-ROK, Chapter 5, Criterion 3g; AFI 91-301, para 2.10.1).	Verify that the installation maintains a current copy of DOD List 6050.5-L, *Hazardous Material Information System Hazardous Item Listing*, With Change 1, November 1992, on compact disc. (5) Verify that the installation maintains copies of other MSDSs for items: - not listed in the HMIS - locally purchased through base supply, medical supply, or civil engineering supply channels.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-15. Installations must have MSDSs for each hazardous chemical procured, stored, or used onsite (FGS-ROK, Chapter 5, Criteria 3f and 3g; AFOSH STD 161-21, para 5c; AFI 91-301, para 2.10.1).	Verify that an MSDS is readily accessible for each hazardous chemical in the workplace during each work shift. (4)(5) Verify that each work center maintains a file of MSDSs for each hazardous material procured, stored, or used at the work center. Verify that MSDSs are obtained or prepared for locally purchased items.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.3-16. The content of MSDSs must meet specific criteria (FGS-ROK, Chapter 5, Criterion 3f).	Verify that the MSDSs are in English and contain at least the following information: (2)(4)(5)
	
	- the identity used on the label:
	  - 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 names(s) of the mixture itself
	  - if the hazardous chemical is a mixture that has not been tested as a whole:
	  - 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 present a health hazard to personnel and
	  - the chemical and common name(s) of all ingredients that have been determined to present a physical hazard when present in the mixture
	- 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.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-17. All hazardous materials on USFK installations must be labeled and have MSDS information attached or available through the HMIS (FGS-ROK, Chapter 5, Criterion 3h and AFOSH STD 161-21, para 5d).	Verify that all hazardous materials are labeled with a Hazardous Chemical Warning Label. (2)(4)(5) Verify that MSDS information is on hand or available through the HMIS. (NOTE: These requirements apply throughout the life cycle of the hazardous materials.) Verify that labels provided by chemical manufacturers, importers, or distributors are not removed, defaced, or changed.
KO.3-18. Each work area that has hazardous materials must keep an inventory of all the hazardous materials used within the work area (AFOSH STD 161-21, para 5f).	Verify that each work area has an inventory of its hazardous chemicals and that the inventory is attached to the Workplace Hazard Communication Program. (2)(4)(5) Verify that supervisors maintain the inventory and update it as necessary. Verify that BES reviews the inventory annually. (NOTE: This requirement does not apply to areas where personnel only handle materials in sealed containers.)
KO.3-19. Installations must have a written Hazard Communication Program that details specific information at each workplace where hazardous materials are used or handled (AFOSH STD 161-21, para 5a).	Verify that each workplace has a copy of the written Hazard Communication Program that includes the following: (1)(2)(4)(5)(6)(7) - location and access to MSDSs - requirements for personnel training - availability of personnel training - work area hazardous chemical inventory - standard operation procedures, operating instructions, or technical orders concerning nonroutine tasks that involve hazardous materials - any contractor operations/interface.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
FLAMMABLE/ COMBUSTIBLE LIQUIDS	(NOTE: FGS-ROK incorporates the requirements of DOD 4145.19-R-1 by reference. Therefore, since the requirements of AFOSH STD 127-43 are substantially identical to those of DOD 4145.19-R-1, all citations to the AFOSH STD must be considered to be requirements of FGS-ROK as well. DOD 4145.19-R-1 is cited directly only where its requirements are not found in the AFOSH STD.)
Handling	

KO.3-20. Flammable/ Combustible liquids must be handled according to specific procedures (AFOSH STD 127-43, para 4g).	Verify that the following procedures are followed when flammable/combustible materials are handled: (1)(2)(4)
	- transfer of liquids from or into vessels, containers, or portable tanks within a building takes place only by means of the following methods:
	  - a closed piping system
	  - safety cans
	  - a device drawing from the top
	  - from a container or tank by gravity through an approved self-closing valve
	- transfer of liquids from a safety can is by means of a device drawing through the top
	- transfer of liquids from a container or tank is done by gravity through an approved self-closing valve
	- approved safety cans are used for transporting and dispensing flammable liquids in quantities of 19 L (5 gal) or less
	- flammable liquids are kept in covered containers when not actually in use
	- Class I liquids are used only when there are no open flames or other sources of ignition.
	
	Verify that safety cans and other portable containers of flammable liquids having a flashpoint at or below 80 °F [26 °C] are painted red with some additional clearly visible identification either in the form of a yellow band around the can or the name of the contents conspicuously stenciled or painted on the can in yellow.
	
	(NOTE: This provision does not apply to shipping containers.)

Storage	
KO.3-21. Flammable or combustible liquids must not be stored in ways that limit the use of exits, stairways, or areas normally used for the safe egress of people (AFOSH STD 127-43, para 4d(1)).	Verify that exits and common traffic routes are not blocked. (1)(4)

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-22. Specific MPs should be considered when storing and handling flammable/combustible materials (MP).	Verify that the installation observes the following MPs: (1)(4) - no positive sources of ignition (open flames, welding, radial heat, mechanical sparks) are in the immediate area - no items are stored against pipes or coils that produce heat - paint drums that are stored horizontally are rolled a half turn every 90 days - containers of paint are palletized prior to storage - aerosol containers are stored in well ventilated areas. (NOTE: These MPs are suggested in DOD 4145.19-R-1.)
KO.3-23. Flammable and combustible liquid containers must meet specific capacity standards (AFOSH STD 127-43, para 4a).	Verify that containers meet the capacity standards in Table 3-4. (1)(2)(4)
KO.3-24. Plastic containers should not be used to store certain liquids in general purpose warehousing (MP).	Verify that plastic containers are not used to store Class I or II liquids in general purpose warehousing. (1)
KO.3-25. Flammable/ combustible material containers must be stored and handled according to specific requirements (FGS-ROK, Chapter 5, Criterion 3a and DOD 4145.19-R-1, para 5-404i).	Verify that containers are stored and handled such that: (1)(2)(4)(5) - open flame devices are not in use in the storage area - combustible materials, other than wood pallets used in the storage of flammable/combustibles, are not stored in the storage facility - labels are not damaged - materials received without a date of manufacture label are marked with the shipping document date - leaking containers are removed from the storage area immediately - containers are stored so that they are issued or used in the order of dates of manufacture, with the oldest material used first - there are no open containers - containers are inspected periodically while in storage.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-26. Flammable and combustible liquid storage cabinets must meet specific structural requirements (AFOSH STD 127-43, para 4b(2)).	Verify that flammable and combustible storage cabinets meet the following structural requirements: (1)(2)(4)(5) - all cabinets are constructed to limit internal temperature to no more than 163 °C (325 °F) when subject to the standard 10 min fire test specified in NFPA 251-196 - the bottom, top, door, and sides of metal cabinets are at least 18 gauge sheet steel and double-walled with 1.5 in. [≈4 cm] air space, and joints are riveted or welded - the doors of metal cabinets have a three-point lock and the door sill is raised at least 2 in. [≈5 cm] above the bottom of the steel cabinet - existing wood cabinets are knot free and of at least 1 in. [≈3 cm] nominal thickness, and all joints are rabbeted and fastened in two directions with flathead wood screws.
KO.3-27. Flammable and combustible liquid storage cabinets are subject to specific limitations on their contents (AFOSH STD 127-43, para 4b(1)).	Verify that the following storage requirements are met: (1)(2)(4)(5) - no more than 455 L (120 gal) of Class I, Class II, and Class IIIA liquids are stored in any cabinet - no more than 227 L (60 gal) of the 455 L (120 gal) are Class I or II liquids.
KO.3-28. Flammable/ combustible liquid storage cabinets should meet specific requirements (MP).	Verify that newly purchased cabinets are of steel rather than wood. (1)(2)(4)(5)
KO.3-29. Flammable/ combustible liquid storage cabinets should be handled properly (MP).	Verify that materials within storage cabinets are segregated. (1)(2)(4)(5) Verify that all containers in cabinets are labeled. Verify that cabinets are constantly closed. Verify that cabinets are conspicuously labeled FLAMMABLE--KEEP FIRE AWAY.
KO.3-30. Installations must not have more than three cabinets in a single fire area (AFOSH STD 127-43, para 4b(1)).	Verify that no more than three cabinets are located in a single fire area. (1)(2)(4)(5) (NOTE: This requirement does not apply to industrial areas.) (NOTE: The limit of three cabinets in a single area may be increased where small cabinets are used; however, the maximum amount of flammable storage cannot exceed 1365 L (360 gal) total.)

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-30. (continued)	(NOTE: Additional cabinets may be located in the same fire area of an industrial area if the additional cabinet, or group of not more than three 455 L (120 gal) cabinets, is separated from other cabinets or group of cabinets by at least 30.5 m (100 ft).)
KO.3-31. Indoor flammable/ combustible storage rooms must meet specific standards (AFOSH STD 127-43, para 4c).	Verify that the installation's flammable/combustible storage rooms have: (1)(2)(4) - walls that meet fire resistance test NFPA 251-1969 - liquid tight wall/floor joints - self-closing fire doors (NFPA 80) - one clear aisle at least 3 ft [≈1 m] wide - a continuous mechanical exhaust ventilation system. Verify that a 4 in. [≈10 cm] raised sill or ramp is provided to adjacent rooms or buildings or that the floor of the storage area is 4 in. [≈10 cm] lower than the surrounding floors. Verify that, if a sill or ramp is not present, the building has an open grated trench that drains to a safe area. Verify that wooden shelving, flooring, dunnage, scuffboards, and/or floor overlay is at least 1 in. [≈3 cm] thick. Verify that electrical wiring and equipment meet NFPA 70 requirements. Verify that dispensing is done by an approved pump or self-closing faucet. Verify that storage in the rooms meets the requirements in Table 3-5. Verify that mechanical exhaust systems are controlled by a switch outside the door and have exhaust outlets on exterior walls. Verify that makeup and exhaust air openings are within 12 in. [≈30 cm] above the floor on one side of the room with one or more makeup air inlets located on the opposite wall. Verify that air movement occurs across all portions of the floor, as far as practical. Verify that containers of over 114 L (30 gal) capacity are not stacked one upon the other.
KO.3-32. Flammable/ combustible liquids stored in buildings where storage rooms or cabinets are not used must meet specific standards (AFOSH STD 127-43, para 4d(2) and 4d(4)).	Verify that containers in indoor storage areas are tightly sealed. (1)(2)(4) (NOTE: This provision does not apply when container contents are transferred, poured, or applied.) Verify that flammable paints, oils, and varnishes in 3.8 L or 19 L (1 gal or 5 gal) containers used for building maintenance are stored temporarily in closed containers at the job site for fewer than 10 calendar days.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-32. (continued)	Verify that the storage of flammable/combustible liquids does not physically obstruct means of egress from the building or area.
KO.3-33. Flammable and combustible liquid storage buildings must meet specific structural requirements (AFOSH STD 127-43, para 4d(3)).	Verify that flammable/combustible storage buildings are one story and devoted principally to the handling and storing of flammable or combustible liquids. (1)(2)(4) Verify that such buildings have 2 h fire-rated exterior walls with no openings within 3 m (10 ft) of the storage area.
KO.3-34. The storage of flammable/combustible liquids in warehouses or storage buildings must meet specific requirements (AFOSH STD 127-43, para 5d).	Verify that the following requirements are met: (1)(2)(4)(5) - if the storage building is located 15 m (50 ft) or fewer from a building or line of adjoining property that may be built upon, the wall facing the building or property line is a blank wall with a fire-resistance rating of at least 2 h - any quantity of liquids may be stored as long as the storage arrangements outlined in Table 3-6 are met - stacked containers are separated by pallets or dunnage when necessary to provide stability and prevent excess stress on container walls - portable tanks stored over one tier high are designed to nest securely - no stack is closer than 1 m (3 ft) to the nearest beam, chord, girder, or other obstruction - piles are 1 m (3 ft) below sprinkler deflectors or discharge points of water spray or other fire protection system - containers have clearly legible labels that identify contents and indicate hazards - aisles are at least 1 m (3 ft) wide when necessary for access to doors, windows, or standpipe connections.
KO.3-35. Installations must meet specific requirements with regard to flammable/combustible materials stored outside (AFOSH STD 127-43, para 4e).	Verify that no more than 4169 L (1100 gal) of flammable/combustible liquids are stored adjacent to buildings. (1)(2)(4)(5) Verify that the quantity and arrangement of materials is in accordance with Table 3-6. Verify that the storage area is graded to divert spills or is surrounded by a curb at least 15 cm (6 in.) high. Verify that drains terminate in a safe location.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.3-36. When flammable/ combustible liquids are stored outside, specific procedures and practices should be followed (MP).	Verify that no leaking or severely corroded drums are present. (1)(2)(4)(5) Verify that drums stored in outdoor storage areas are placed horizontally (on sides) in double rows, butt-to-butt, with closures (bungs and vents) facing outward. Verify that the end drum of the bottom tier is braced to prevent rolling.
KO.3-37. Flammable/ combustible storage areas must meet certain fire protection standards (AFOSH STD 127-43, para 4f).	Verify that flammable/combustible storage locations meet the following requirements: (1)(2)(4)(5) - at least one portable fire extinguisher rated not less than 10-BC is located outside the door of any room used for storage and within 3 m (10 ft) of the door opening - at least one portable fire extinguisher rated not less than 20-BC is located within 3 to 7.5 m (10 to 25 ft) of any Class I or Class II liquid storage area outside of a storage room, but inside a building - fire extinguishing systems are sprinklers, water spray, or other USAF approved systems - open flames and smoking are not permitted within 15 m (50 ft) of flammable/ combustible liquid storage areas - water reactive materials are not stored in the same room with flammable/combustible liquids, except for small quantities that can be stored in laboratories - containers and portable tanks used for Class I liquids are electrically bonded and grounded during transfer of liquids - liquid containers are protected from heat sources. Verify that the installation takes positive measures to eliminate sources of ignition, such as open flames, electrical smoking, cutting and welding, hot surfaces, static, mechanical sparks, radiant heat, and spontaneous ignition.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Industrial Storage Areas	(NOTE: Checklist items 3-38 through 3-40 pertain to industrial areas where the use of flammable or combustible liquid is incidental to the principal business or where flammable or combustible liquids are handled or used only in unit physical operations that do not involve chemical reactions.)

KO.3-38. Areas where flammable/combustible materials are stored, dispensed, or used in industrial plants should meet specific guidelines (MP).	Verify that the following requirements are met: (1)(2)(4)(5)
	- portable fire extinguishers and fire control equipment are in place in quantity and type as needed for the hazards of operation and storage at the site
	- adequate precautions are taken to prevent sources of ignition at the site
	- Class I liquids are not dispensed into containers unless nozzles and containers are electrically interconnected
	- operations such as welding and cutting for repairs to equipment are done under the supervision of an individual in charge
	- maintenance and operating practices control leakage and prevent the accidental escape of flammable or combustible liquids:
	  - adequate aisles are maintained
	  - combustible waste materials and residues are kept to a minimum, stored in covered metal containers, and disposed of daily
	  - the grounds area around the buildings and unit operating areas are kept free of weeds, trash, or other unnecessary combustibles
	- tank vehicle and tank car loading or unloading facilities are separated from aboveground tanks, warehouses, and other plant buildings or nearest line of adjoining property by a distance of 25 ft [≈7 m] for Class I liquids and 15 ft [≈5 m] for Class II and III liquids.

KO.3-39. Installations must meet specific requirements with regard to incidental storage of flammable/combustible liquids in industrial areas (AFOSH STD 127-43, para 4h).	Verify that the following requirements are met in industrial areas: (1)(2)(4)(5) - storage is in metal cabinets stenciled FLAMMABLE KEEP FIRE AWAY - storage is limited to 4 L (1 gal) of Class I or 40 L (10 gal) of Class II and III liquids - amount of liquid stored in the cabinet does not exceed 40 L (10 gal) - containers in the cabinet are closed - storage is limited to a 5-day supply - each work center has only one cabinet. Verify that the fire department was consulted prior to the establishment of incidental storage areas in industrial shops.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-40. Areas in which flammable/combustible liquids are used in unit operations, such as mixing, drying, evaporating, filtering, or distilling, should meet specific operating standards (MP).	Verify that the following requirements are met: (1)(2)(4)(5) - areas are located so that each building or unit of equipment is accessible from at least one side for fire fighting - areas in which unstable liquids are handled or small scale unit chemical processes are carried on are separated from the remainder of the area by a fire wall of 2 h minimum fire resistance rating - emergency drainage systems direct leakage and fire protection water to a safe location - emergency drainage systems, if connected to public sewers or discharged into public waterways, are equipped with traps or a separator - when Class I liquids are being used, ventilation is provided at a rate of not less than 1 $ft^3/min/ft^2$ of solid floor area through either natural or mechanical means - equipment is designed to limit flammable vapor-air mixtures.
BULK STORAGE **Compressed Gases**	
KO.3-41. Installations must meet specific requirements with regard to storage of compressed gases in roofed, open-sided sheds (FGS-ROK, Chapter 5, Criterion 3a and DOD 4145.19-R-1, para 5-405d(1)).	Verify that the compressed gas storage sheds meet the following requirements: (1)(2)(4)(5) - they are on concrete slabs above grade - they are located in a secured area - they are separated from other buildings by at least 15 m (50 ft) - if they have one or more sides, provisions are made to ensure complete change of air at least six times per hour - they are unheated. Verify that flammable gases and gases that support combustion are stored in separate sheds with at least 15 m (50 ft) between sheds. Verify that, if necessary, stationary or rotating roof vents are used to lower temperature near ceilings to ambient conditions during warm weather. Verify that cylinders and portable tanks have pressure relief devices installed.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-42. Installations must meet specific requirements with regard to storage of compressed gas cylinders in enclosed storage facilities (FGS-ROK, Chapter 5, Criterion 3a and DOD 4145.19-R-1, para 5-405d(2)).	Verify that the compressed gases storage areas meet the following requirements: (1)(2)(4)(5) - buildings are one story in height, above grade, of noncombustible construction - separate storage compartments or rooms are available for flammable gases and gases that support combustion - at least one wall of each storage room or compartment for combustible gases is an exterior wall - every storage room or compartment is provided with either a gravity or a mechanical exhaust ventilation system designed to provide complete change of air at least six times per hour - buildings are not heated - cylinders and portable tanks have pressure relief devices installed.
KO.3-43. Compressed gases must be handled in accordance with specific good practices (FGS-ROK, Chapter 5, Criterion 3a and DOD 4145.19-R-1, para 5-405c(6) through 5-405c(9), 5-405c(14), and 5-405c(22)).	Verify that the following practices and procedures are observed in the handling of compressed gases: (1)(2)(4)(5) - oxygen cylinders are free from grease or oil - numbers or markings that are stamped on the cylinders are not altered or defaced - additional markings are not applied to cylinders without approval - empty cylinders are stored separately but in the same manner as full cylinders - valves on empty cylinders are closed - NO SMOKING signs are posted in and around compressed gas storage sheds.
Acids	
KO.3-44. Installations must meet specific requirements with regard to the storage and handling of acids in bulk (FGS-ROK, Chapter 5, Criterion 3a and DOD 4145.19-R-1, para 5-406).	Verify that the bulk acid storage areas meet the following: (1)(2)(4)(5) - buildings are one story in height, of noncombustible or fire-resistant construction - permanent louvered openings at floor and ceiling levels or other gravity ventilation methods are provided - safety equipment is available and operational (eye wash, deluge shower, self-contained breathing apparatus, protective clothing) - buildings are heated to prevent freezing (if applicable) - different acids are stored separately in designated areas - NO SMOKING signs are posted - there are either floor drains or wall scuppers, if the building has automatic - sprinkler protection - workers are provided with protective safety equipment and a copious, flowing supply of fresh, clean water for first aid.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-44. (continued)	(NOTE: Acid storage buildings should have automatic sprinkler protection.) (NOTE: In lieu of aisle space, noncombustible barriers that are at least 3 ft [≈ 1 m] high and sealed at floor level may be used to obtain maximum storage space.)
KO.3-45. Workers in facilities where acids are stored in bulk should be provided with a copious, flowing supply of fresh, clean water for first aid (MP).	Verify that workers in facilities where acids are stored in bulk are provided with a copious, flowing supply of fresh, clean water for first aid. (2)(4)
USE OF HIGH PRESSURE GAS	
KO.3-46. Users of high pressure gas are subject to certain requirements (FGS-ROK, Chapter 5, Criterion 3m(1)).	Verify that anyone who uses high pressure gas takes actions for the prevention of danger. (4) (NOTE: This requirement applies if there is possibility of danger in using facilities, equipment, or containers.)
KO.3-47. Users of special high pressure gas are subject to specific requirements (FGS-ROK, Chapter 5, Criterion 3m(2)).	Verify that anyone who intends to use special high pressure consults a safety manager prior to starting the activity. (4) (NOTE: The safety manager is responsible for preventing danger and ensuring the safety of facilities, equipment, and gas containers.)
TRANSPORTATION	
KO.3-48. Hazardous materials shipments must meet specific standards (FGS-ROK, Chapter 5, Criterion 3c).	Verify that hazardous materials shipments are accompanied by shipping papers that clearly describe the quantity and identity of the material and include an MSDS. (2)(4)(5) Verify that all drivers of hazardous material shipments are briefed on the hazardous material included in the shipment, including: - health risks of exposure - physical hazards of the material, including the potential for fire, explosion, and reactivity.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-48. (continued)	Verify that hazardous materials are identified as "Ignitable," "Corrosive," "Reactive," or "Toxic" in both the shipping papers and the briefing for the driver. Verify that supervisory personnel do a walk-around inspection of the vehicles before and after the material is loaded. Verify that two pair or more of protective gloves and boots and two or more protective coats and shovels are kept onboard the hazardous material transportation vehicle. Verify that signs in English and Korean are placed on the containers or covers of toxic substances listed in Tables 3-1 and 3-2. Verify that such signs meet the following requirements: - for special toxic substances: the name of the special toxic substance is shown and "Special Toxic Substance" is written in white on a black background with a thick white border (See Figure 5.1 in Table 3-7) - for toxic substances: the name of the toxic substance is shown and "Toxic Substance" is written in red on a white background with a thick red border (see Figure 5.2 in Table 3-7) - size: the size of the signs for toxic substances and for special toxic substances is greater than 1/10 of the width of the cover or container label and greater than 1.5 cm [≈0.6 in.] - color: the color of the signs for toxic substances and for special toxic substances must be black. Verify that, if more than 100 g or 100 mL are being transported, the following descriptive information is provided: - the name and address of the manufacturer or importer - manufacturing registered number and manufacturing date - volume (weight) or quantity - constituents and contents - uses and methods of use - registration number/permission number and effective period - name of antidotes or detoxifying methods for the toxic substances - precautions in handling. Verify that, if less than 100 g or 100 mL are being transported, the name of a manufacturer is provided. Verify that any transportation vehicle that carries toxic substances or special toxic substances has a DOT and Korean placard provided in the middle part of the back side of the vehicle (see Figure 5.3 in Table 3-7).

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-49. International air shipments of hazardous materials originating from a DOD installation must meet specific standards (FGS-ROK, Chapter 5, Criterion 3d(1)).	Determine whether the installation ships hazardous materials internationally by air. (7) Verify that the following shipping standards are met: - the International Air Transportation Association (IATA) Rules - appropriate USFK and Component instructions.
KO.3-50. International shipments of hazardous material on the open sea from USFK installations must meet specific standards (FGS-ROK, Chapter 5, Criterion 3d(2)).	Determine whether the installation ships hazardous materials internationally on the open sea. (7) Verify that the following shipping standards are met: - the International Maritime Organization (IMO) Rules - appropriate USFK and Component instructions.
KO.3-51. Certain practices should be carried out in the course of onsite transportation of hazardous materials between buildings (MP).	Verify that procedures exist to manage movement of hazardous materials throughout the installation. (7) Verify that drivers are trained in spill control procedures. Verify that provisions have been made for securing hazardous materials in vehicles when transporting.
TRAINING	
KO.3-52. Personnel who manage, use, store, and/or ultimately dispose of hazardous materials must be trained (FGS-ROK, Chapter 5, Criterion 3k and AFOSH STD 161-21, para 5e).	Verify that personnel who manage, use, store, and/or ultimately dispose of hazardous materials are trained in spill response and related handling issues. (1)(2)(3)(4)(5)(6)(7) Verify that the installation provides personnel with effective information and training on the hazardous chemicals in their work area. Verify that information and training are provided at the time of initial assignment and whenever a new physical or health hazard on which personnel have not been trained is introduced into the work area. Verify that personnel are informed of the following: - any operations in their work area where hazardous chemicals are present - the location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and MSDSs.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-52. (continued)	Verify that the training provided to personnel includes at least the following: - methods and observations that may be used to detect the presence of or release of a hazardous chemical in the work area (such as monitoring conducted by the installation, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.) - the physical and health hazards of the chemicals in the work area - the measures that personnel can take to protect themselves from these hazards, including specific procedures implemented to protect personnel from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used - the details of the hazard communication program developed by the installation, including an explanation of the labeling system and the MSDS, and how personnel can obtain and use the appropriate hazard information.
RELEASES	(NOTE: See Section 8, POL Management, for Spill Plan requirements.)
KO.3-53. Installations that store hazardous materials and hazardous wastes must designate one or more emergency coordinators for spill response (FGS-ROK, Chapter 18, Criterion 3d(1)).	Verify that one or more emergency coordinators for spill response have been designated. (2)(3)(4)(6) Verify that, if more than one emergency coordinator has been designated, one is named as primary coordinator. Verify that the primary coordinator and the others are listed in the contingency plan in the order in which they will assume responsibility.
KO.3-54. Installations must make specific notifications in the event of spills of POL or hazardous substanaces (FGS-ROK, Chapter 18, Criteria 3e(2), 3e(4), and 3e(5)(b) and 3e(5)(d)).	Verify that spills of reportable quantities (RQs) of POL or hazardous substances are reported to the Installation On-Scene Coordinator (IOSC) immediately. (2)(3)(4)(6) Verify that immediate action is taken to eliminate the source and contain the spill. Verify that the IOSC immediately notifies: - the appropriate Military Department and/or Defense Agency - the USFK Assistant Chief of Staff, Engineer. Verify that the reporting criteria for the spill report are in accordance with USFK Regulation 703-1.

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.3-54. (continued)	Verify that, when a POL or hazardous substance spill occurs outside the installation or inside the installation and cannot be contained within its boundaries, or threatens a ROK drinking water resource, the following are notified: - the facility/base engineer - the USFK Public Affairs Officer (PAO) or Command Center (CC)-Seoul (after working hours) - the appropriate ROK authorities.
KO.3-55. Installations must take specific actions in the event of spills of POL or hazardous substances (FGS-ROK, Chapter 18, Criteria 3e(5)).	Determine whether a POL or hazardous substance spill has occurred inside the USFK installation, cannot be contained within the installation boundaries, and threatens a ROK drinking water resource. (2)(3)(4)(6) Verify that the unit that caused the release takes immediate action to contain the damage and cleanup the spill within the limits of their capabilities. Verify that the organization that causes the spill immediately notifies the area staff duty officer. Verify that the area staff duty officer in turn contacts the facility/base engineer and USFK PAO or CC--Seoul (after working hours). Verify that the facility/base engineering work force serves as the primary responder. (NOTE: It is the responsibility of the PAO and the Chief, Public Information, CC-Seoul to assist the local Installation Commander (IC) in informing local government officials of the incident.) Verify that the IC or his/her representative notifies ROK authorities immediately. Verify that USFK response to off-post spills/damages are limited to notification actions, spill control, collection of standing product, and fire prevention. (NOTE: Under the provisions of Article XXIII of the US-ROK Status of Forces Agreement (SOFA), claims by local national individuals or organizations for damages arising from off-installation spills will be handled through the established claims procedures.) (NOTE: The organization responsible for causing the spill will be responsible for reimbursement of costs associated with spill response and associated waste disposal.)

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Table 3-1

Special Toxic Substances

(FGS-ROK Table 5-2)

Number*	Chemical Name	Percentage**
1.	(1,1'-Biphenyl)-4-amine: p-Biphenylamine, p-aminodiphenyl	
2.	(1R,4S,4aS,5S,8R,8aR)-1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexachloro-1,4,5,8-dimethanonaphthalene: HHDN, Aldrin, Octalene	
3.	(2,4-Dichlorophenoxyl) acetic acid: 2,4-D, Hedonal Trionxol	
4.	(S)-a-Cyano-3-phenoxybenzyl(Z)-(1R-cis)-2, 2-dimethyl-3-[2-(2,2,2-trifluoro-1-trifluoromethylet-hoxycarbonyl) vinyl] cycloptopanecarboxylate	
5.	[3-Chloro-N-(3-Chloro-5-trifluoromethyl-2-pyridyl)]-a,a,a-trifluoro-2, 6-dinitro-p-toluidine: Fluazinam	
6.	[5-(3-Carboxy-4-hydroxypeenyl) (3-carboxy-4-oxo-2, 5-cyclohexadien-1-ylidene)methyl]-2-hydroxybenzoic acid triammonium salt: Aluminon, Lysofon	
7.	1,1'-Oxybis[2-chloroethane]: sys-Dichlorothyl ether, DCEE, Chlorex	
8.	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane: DDT	
9.	1,1-Dimethyl-4,4-dipyridinium: Paraquat, Gramoxone	
10.	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene: HEOD, Dieldrin, Octalox	
11.	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-exo-1,4-exo-5, 8-dimethanonaphthalene: Endrin, Nendrin	
12.	1,2,3,6-Tetrahydro-N-(trichloromethylthio)phthalimide: Captan, Captab, Orthocide	0.2
13.	1,2,4,5,6,7,8,8-Octachloro-1,2,3,3a,4,7,7a-hexahydro-4,7-methano-1H-indene: Chordan(e), Toxichlor, Niran	
14.	1,2-Dibromo-3-chloropropane: DBCP	
15.	1,2-Dibromorthane	
16.	1,3,4,5,6,7,8,8-Octachloro-1,3,3a,7,7a-hexahydro-4,7-methanoisobenzofuran: Isobenzen, Telorin, Omtan	
17.	1,3-Dichloropropene	
18.	1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene: Drinox, Heptachlor(e), Heptamul	5
19.	1-(2,2-Dimethyl-1-methylthiomethylpropylideneamino-oxy)-N-methylformamide: Thiofanox, Thiofanocarb, Dacamox	
20.	1-(4-Nitrophenyl)-3-(3-pyridylmethyl)urea: Priminl, Vacor	3
21.	1-Benzothiazol-2-yl-1, 3-dimethylurea: Methabenzthiazuron, Tribunil	

(continued)

Table 3-1 (continued)

Number*	Chemical Name	Percentage**
22.	1L-(1,3,4/2,6)-2, 3-Dihydroxymethyl-4-[(1S, 4R, 5S, 6S)-4,5,6-trihydroxy-3-hydroxymethylcyclohex-2-enylamino]cyclohexyl-B-D-glucopyranoside: Validamycin(A), Validacin, Valimon	
23.	2,2-Dimethyl-2,3-dihydro-7-benzofuranyl-N-methylcarbamate: Carbofuran, Furadan, Curaterr	5
24.	2,3-Dihydro-2, 2-dimethylbenzenzofran-7-yl(dibutylaminothio)methylcarbamate: Carbosulfan, Marshal	
25.	2-Amino-3-chloro-1,4-naphthoquione: ACN, Mogeton, ACNQ	
26.	2-Chloro-2-diethylcarbamoyl-1-methylvinyl dimthyl phosphate: Phosphamidon, Dimecron	
27.	2-Chloro-N-(2-chloroethyl)-N-methylethanamine: Mechlorethamine	
28.	2-Dimethyl-amino-5,6-dimethyl-4-pyrimidinyl dimethylcarbamate: Pirimor, Pirimicarb	
29.	2-Ethylthioethyl O,O-dimethyl phosphorothioate: Mathyl demeton, Metasystox	
30.	2-Chloro-4-methyl-6-dimethylaminopyrimidine	
31.	2-Methyl-2-(methylthio)propionaldehyde O-methylcarbamoyloxime: Aldicarb, Temik	
32.	2-tert-Butyl-5-(4-tert-butylbenzylthio)-4-chloropyridazin-3(2H)-one: Pyridaben	
33.	3,4-Dichlorobenzenediazothiourea: Chloropromurite, Muritan, Promurit	
34.	3-(3-Biphenyl-4-yl-1,2,3,4-tetrahydro-1-maphthyl)-4-hydroxycoumarin: Difenacoum, Ratak	
35.	3-[2-(3,5-Dimethyl-2-oxocyclohexl)-2-hydroxyethyl] glutarimide: Cycloheximide, Actidione	
36.	3-[3-(4'-Bromobiphenyl-4-yl)-3-hydroxy-1-phenylpropyl]-4-hydroxycoumarin: Bromadiolone, Maki	
37.	3-[3-(4'-Bromol[1,1-biphenyl]-4-yl)1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one: Brodifacoum, Talon	
38.	4-Hydroxy-3[1,2,3,4-tetrahydro-3-[4-(4-trifluoromethylbenzyloxy)phenyl]-1-naphthyl]coumarin: Flocoumafen, Storm, Stratagen	
39.	5-(A-Hydroxy-A-2-pyridylbenzyl)-7-(A-2-pyridybenzylidene)-5-norbomene-2,3-dicarboximido: Norbomido, Raticate, Shoxin	
40.	6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin 3-oxide: Endosulfan, Thiodan, Chlorthiepin	
41.	7-Chlorobicyclo[3.2.0]hepta-2,6-dien-6-yl dimethylphosphate: Heptenophos, Ragadan, Hostaquick	
42.	A,A,A-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine: Trifluralin, Treflan, Elancolan	

(continued)

Table 3-1 (continued)

Number*	Chemical Name	Percentage**
43.	A-Naphthyl thiouera: ANTU, Bantu, Dirax	
44.	Aluminum phosphide: Celphos, Phostoxin	
45.	Arsenic pentoxide: Arsonic acid anhydride	
46.	Arsenic trioxide: Arsenious acid, Arsenious oxide	
47.	Carbon tetrachloride	
48.	Chorinated 2,2-dimethyl-3-methylenebicyclo[2.2.1]heptane: Camphechlor, Chorinated camphene, Toxaphene	
49.	Diethyl 1,3-diethietan-2-ylidenephosphoramidate: Fosthietan, Acconem, Geofos	
50.	Diethyl 1,3-dithiolan-2-ylidenephosphoramidate: Phosfolan, Cyolane, Cylan	
51.	Diethyl(4-methyl-1,3-dithiolan-2-ylidene)phosphoramidate: Mephosfolan, Cytrolane	
52.	Diisopropyl fluorophosphate: Isofluorophate, DFP	
53.	Dimethyl-2,2-dichlorovinylphosphate: Dichlorvos, DDVP	
54.	Dithyl 5-methyl-3-pyrazolyl phosphate: Pyrazoxon	
55.	Fluoroacetic acid	
56.	Fluoroacetic acid amide: Fussol, Fluoroacetamide	
57.	Hexachlorocyclohexane: BCE, HCH	
58.	Lead arsenate	
59.	Methyl bromide	
60.	N'-(2-Methyl-4-chlorophenyl)-N,N-dimethylformamidine: Chlordimeform, Galecron, Fundal	
61.	N,N-Dimethyl-1-methyl carbamoyloxyimino-2-(methylthio)acetamide: Oxamyl, Vydate	
62.	N-Methyl-2,4-dinitro-N-(2,4,6-tribromophenyl)-6-(trifluoromethyl)benzenenamine: Bromethalin(e)	
63.	O,O,O,O'-Tetraethyl dithiopyrophosphate: Sulfotep, Bladafum	
64.	O,O-Bis(4-Chlorophenyl)N-acetimidoylphosphoramidothioate: Phosacetim, Gophacide	
65.	O,O-Diethyl O-2[-(ethythio)ethyl]phosphorothioate mixture with O,O-Diethyl S-2[-(ethythio)ethyl]phosphorothioate: Demeton	
66.	O,O-Diethyl O-p-nitrophenyl thiophosphate: Parathion	
67.	O,O-Diethyl O-pyrazin-2-yl phosphorothioate: Thionazin, Nemafos, Cymnem	
68.	O,O-Diethyl O-quinoxalin-2-yl phosphorothiate: Quinalphos, Bayrusil, Ekalux	

(continued)

Table 3-1 (continued)

Number*	Chemical Name	Percentage**
69.	O,O-Diethyl S-2[-ethythio)ethyl]phosphorodithioate: Disulfoton, Thiodemeton	
70.	O,O-Diethyl S-isopropylcarbamoylmethyl phosphorodithioate: Prothoate, Fac	
71.	O,O-Dimethyl O-4-(methylsulfinyl phenyl)thiophosphate: Fensulfothion, Terracur-P, Dasanit	
72.	O,O-Dimethyl O-p-nitrophenyl thiophosphate: Methyl parathion, Metaphos, Metacide	
73.	O,O-Dimethyl S-[(4-oxy-1,2,3-benzotriazol-3(4H)-yl)methyl] dithiophosphate: Azinphopsmethyl, Guthion	
74.	O,O-Dimethyl S-methyl carbamoylethyl dithiophosphate: Dimethoate, Cygon	
75.	O-2,5-Dichloro-4-(methylthio)phenyl O,O-diethyl phosphorothioate: Chlorthiophos, Celathion	
76.	O-Ethyl S,S-dioropyl phosphorodithioate: Ethoprophos, Mocap, Ekatin	
77.	O-Methyl O-(4-bromo-2,5-dichorophenyl)phenyl thiophosphate: Phosvel, Abar, Leptophos	
78.	Octamethylprophosphoramide: Schradam, OMPA, Systam	
79.	Other extremely hazardous substances designated by the Minister of Environment	
80.	p-Chlorophenyldiazothiourea	
81.	Pentachlorophenol	
82.	Phenylmercuric triethanol ammonium borate: PTA-B	
83.	Phenylmercury acetate: PMA, PMAC	
84.	S-[[1,1-(Dimethylethyl)thio]methyl] O,O-dimethyl phosphorodithioate: Terbufos, Counter	
85.	S-[2-(Diethylamino)ethyl] O,O-diethyl phosphorothioate: Amiton, Tetram	
86.	S-2-Chloro-1-phthalimidoethyl O,O-diethyl dithiophosphate: Dialifos, Dialifor, Torak	
87.	S-Chloromethyl O,O-diethyl phosphorodithioate: Chlormephos, Dotan	
88.	S-Ethylthioethyl O,O-dimethyl phosphorodithioate: Thimeton, Ekatin	
89.	Strychnidin-10-one: Strychinine	
90.	tert-Butyl(E)-a-(1,3-dimethyl-5-phenoxypyrazol-4-ylmethyleneamino-oxy)-p-toluate: Fenpyroximate	
91.	Tetraalkyllead	
92.	Tetraethyl pyrophosphate: TEPP, Tetron, Vapotone	
93.	Tetramethyl phosphorodiamidic fluoride: Dimefox	

(continued)

Table 3-1 (continued)

Number*	Chemical Name	Percentage**
94.	Thallium acetate	
95.	Thallium nitrate	
96.	Thallium sulfate	
97.	Thiosemicarbazide	
98.	Tributyl tin oxide	
99.	Trichloronitromethane: Chloropicrin	

* Chemical concentrations are 1 percent if not listed.

**Chemical is not regarded as "hazardous" if its concentration is less than the given percentage (if given).

Table 3-2

Toxic Substances

(FGS-ROK Table 5-1)

Number*	Chemical Name	Percentage**
1.	(+)-a-[N-(3-Chlorophenyl)cyclopropanecarboxamido]-G-butyrolactone: Cyprofuram, vinicur	
2.	(1,1-Biphenyl)-4-amine: p-Biphenylamine, p-aminodiphenyl	
3.	(1R,4S,4aS,5S,8R,8aR)-1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene: HHDN, Aldrin, Octalene	
4.	(2,4,5-Trichlorophenoxy)acetic acid: 2,4,5,-T, Weedone	
5.	(2,4-Dichlorophenoxy)acetic acid: 2,4-D, Hedonal, Trinoxol	
6.	(3B,5Z,7E,222E)-9,10-Secoergosta-5,7,10(19),22-tetraen-3-ol: Calciferol, Vitamin D2, Ergocalciferol	
7.	(E)-O-2-Isopropoxycarbonyl-1-methylvinyl thylethylphosphoramidothioate: Propetamphos, Safrotin	
8.	(R,S)-aCyano-4-fluoro-3-phenoxybenzyl-(1R,S)-cis,trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate: Baythroid, Cyfluthrin, Cyfoxylate	0.5
9.	(RS)-a-Cyano-3-phenoxybenzyl N-2-(2-cloro-a,a,a-trifluoro-p-tolyl)-D-valinate: Fluvalinate, Mavrik	
10.	(RS)-a-Cyano-3-phenoxybenzyl(s)-2-(4-diffluoromethoxyphenyl)-3-methylbutyrate: Flucythrianate, Cybolt, Cytrin	
11.	(S)-2,3,5,6-Tetrahydro-6-phenylimidazo[2,1-b]thiazole: Levamisole, Ketrax	3.4
12.	(S)-3-(2-Piperidinyl)pyridine: Anabasin, Neomicotine	
13.	(S)-a-Cyano-3-phenoxybenzil(1R)-cis-3-(2,2-dibromovinyl0-2,2-dimethylcyclopropanecarboxylate: Deltamethrin, Decamethrin, Butox	
14.	(S)-a-Cyano-3-phenoxybenzyl(Z)-(1R-cis)-2,2-dimethyl-3-[2-(2,2,2-trifluoro-1-trifluoromethylet-hoxycarbonyl)vinyl]cycloptopanecarboxylate: Acrinatrin	
15.	(S)-a-Cyano-3-phenozybenzyl (1R,3S)-2,2-dimethyl-3-[(RS)-1,2,2,2-tetrabromoethyl]cyclopropanecarboxylate: Tralomethrin(e)	
16.	[3-Chloro-N-(3-Chloro-5-trifluoromethyl-2-pyridyl)]-a,a,a-trifluoro-2,6-dinitro-p-toluidine: Fluazinam	
17.	0,0-Bis(4-chlorophenyl)N-acetimidoylphosphoramithioate: Phosacetim, Gophacide	
18.	0,0-Diethyl 0-(2,4-dichlorophenyl)thiophosphate: Dichlofenthion, Ecp, Nemacide	
19.	0,0-Diethyl 0-(3,5,6-trichloro-2-pyridl)thiophosphate: Chlorpyrifos, Dursban, Lorsban	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
20.	0,0-Diethyl 0-(3-methyl-5-pyrazolyl)phosphate: Pyrazothion	
21.	0,0-Diethyl 0-(3-oxo-2-phenyl-2H-pyridazin-6-yl)phosphorothioate: Pyridaphenthion	
22.	0,0-Diethyl 0-[2-(ethylthio)ethyl]phosphorothioate mixture with 0,0-diethyl S-[2-(ethylio)ethyl]phosphorothioate: Demeton, Systox, Mercaptophos	
23.	0,0-Diethyl 0-1-phenyl-1,2,4-triazol-3-ylphosphorothioate: Triazophos, Hostathion	
24.	0,0-Diethyl 0-p-nitrophenyl thiophosphate: Parathion	
25.	0,0-Diethyl 0-pyrazin-2-yl phosphorothioate: Thiomazin, Nemaphos, Cynem	
26.	0,0-Diethyl 0-quinoxalin-2-yl phosphorothioate: Quinalphos, Bayrusil, Ekalux	
27.	0,0-Diethyl S-[2-(ethylthio)ethyl]phosphorothioate: Disulfoton, Thiodemeton	
28.	0,0-Diethyl S-isopropylcarbamoylmethyl phosphorothioate: Prothoate, Fac	
29.	0,0-Diisopropyl S-benzylthiophosphate: Kitazin, IBP	
30.	0,0-Dimethyl 0-(3-methyl)-nitrophenyl)thiophosphate: Fenitrothion, Monocrotophos	
31.	0,0-Dimethyl 0-4-(methylthio)phenyl phosphorothioate: Baytex, Fenthion, MPP	2
32.	0,0-Dimethyl 0-p-nitrophenyl thiophosphate: Methyl parathion, Methaphos, Metacide	
33.	0,0-Dimethyl S-(1,2-diethoxycarbonylethyl)dithiophosphate: Malathion	
34.	0,0-Dimethyl S-(5-methoxy-2-oxo-1,3,4-thiodiazol-2(3H)-ylmethyl)dithiophosphate: Methidathon, DMTP	
35.	0,0-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(4H)-yl)methyl]dithiophosphate: Azinphops-methyl, Guthion	
36.	0,0-Dimethyl S-methylcarbamoylmethyl dithiophosphate: Dimethoate, Cygon	
37.	0,0-Dimethyl S-phthalimidomethyl phosphorodithioate: Phosmet, PMP, Imidan	
38.	0,0-Dimethyl (S-2-(1-methylcarbamoylethylthio)ethyl thiophosphate: Vamidothion	
39.	0,0-Dimethyl-0,4-sulfamoylphenyl phosphorothioate: Cythioate, Cyflee	
40.	0,0-Dimethyl-2-methylcarbamoylmethyl phosphorothioate: Omethoate, Folimat	
41.	0,0-Dimethyldibromo-1,2-dichloroethyl phosphate: Naled, Dibrom, Bromchlophos	
42.	0,0-Dithyl[0-(methylsulfinyl)phenyl]thiophosphate: Fensulfothion, Terracur-P, Dasanit	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
43.	0,4-Dimethylsulfamoylphenyl 0,0-dimethyl phosphorothioate: Famophos, Famphur	
44.	0,4-Dimethylsulfamoylphenyl 0,0-dimethyl phosphorothioate: DSP, Kaya-ace	
45.	0,S-Dimethyl phosphoramidothioate: Methamidophos, Monitoior, Tamaron	
46.	0-(4-bromo-2,5-dichlorophenyl)0,0-diethyl phosphorothioate: Bromophos-ethyl, Nexagan	
47.	0-[2-(Dimethylamino)-6-methyl-4-pyrimidinyl] 0,0-diethylphosphorothioate: Pyrimithate, Pyrimiate, Diothyl	
48.	0-2,4-Dichlorophenyl 0-ethyl phenylphosphorothioate: EPBP, S-Seven	3
50.	0-2,5-Dichloro-4-(methylthio)phenyl 0,0-diethyl phosphorothioate: Chlorthio-phos, Celathion	
51.	0-2-Diethylamino-6-mathylpyrimin-4-yl 0,0-diethylphosphorothioate: Pirimi-phos-ethyl, Pirimicid	
52.	0-4-Bromo-2-chlorophenyl 0-ethyl S-propyl phosphorothioate: Profenophos, Curacron, Selecron	
53.	0-Methyl 0-(4-Bromo-2,5-dichlorophenyl)phenyl thiophosphate: Phosvel, Abar, Leptophos	
54.	0-Methyl 0-cyclohexyl S-(p-chlorophenyl)thiophosphate: MHCP, Cerezin	
55.	1,1',1"-Phosphinylidyne triaziridine: Triethylene phosphoramide, Aphoxide, APO	
56.	1,1',1"-Phosphinylidynetris (2-methylaziridine): Metepa, Methyl aphoxide, MAPO	
57.	1,1'-Iminodi(octamethylene)diguanidine: Guazatine, Panoctine	3.5
58.	1,1'-Methylenedi(thiosemicarbazide): Bisthiosemi, Kayanex	2
59.	1,1'-Oxybis[2-chloroethane]: sym-Dichloroethyl ether, DCEE, Chlorex	
60.	1,1'-Thiobis(2-chloroethane): Mustard gas	
61.	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane: DDT	
62.	1,1-Dichloro-1-nitroethane: Dichloronitroethene, Ethide	
63.	1,1-Dimethyl-4,4-dipyridinium: Paraquat, Gramoxone	
64.	1,1-Ethylene-2,2-dipyridylium dibromide: Diquat, dibromide, Reglox, Reglone	
65.	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4a,5,6,7,8,8a-octahydro-exo-1,4-exo-5,8-dimethanonaphthalene: Endrin, Nendrin	
66.	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4a,5,6,7,8,8a-octahydro-endo-exo-1,4,5,8-dimethanonaphthalene: HEOD, Dieldrin, Octalox	
67.	1,2,3,6-Tetrahydro-N-(trichloromethylthio)phthalimide: Captan, Captap, Orthocide	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
68.	1,2-Dibromo-3-chloropropane: DBCP	
69.	1,2-Dibromoethane: EDB	50
70.	1,2-Dihydro-3,6-pyridazinedione: Maleic hydrazide, MH	
71.	1,2,O-(2,2,2-Trichloroethylidene)-q-D-glucofuranose: Chloralose, Glucochloralose, Glucochloral	
72.	1,3,4,5,6,7,8,-Octachloro-1,3,3a,4,7,7a-hexahydricthanoisobenzofuran: Isobenzan, Telorin, Omtan	
73.	1,3,4,5,6,7,8,-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7,1H-indene: Chlordan(e), Toxichlor, Niran	
74.	1,3-Di(caramoylthio)-2-(N,N-dimethylamino)propane: Cartap, Padan, Cadan	2
75.	1,3-Dichloropropene	
76.	1,3-Dimethyl-1-(5-trifluoromrthyl-1,3,4-thiadiazol-2-yl)urea: Thiazafluron, Erbotan	
77.	1,4,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene: Drinox, Heptachlor(e), Heptamul	6
78.	1,4-Dichlorobutane	
79.	1-(2,2-Dimethyl-1-methylthiomethylpropylidenamino-oxy)-N-methylformamide: Thiofanox, Thiofanocarb, Dacamox	
80.	1-(4-Amino-1,2-dihydro-2-oxopyrimidin-1-yl)-4[(S)-3-amino-5-(1-methylquanidino)valeramido]-1,2,3,4-tetradoxy-B-D-erythrohex-2-enopyranuronic acid: Blasticidin-S	
81.	1-(4-Nitrophenyl)-3-(3-pyridylmentl)urea: Priminil, Vacor	
82.	1-[(Dimethylamino)carbonyl]-5-methyl-1H-pyrazol-3-yl dimethylcarnamate: Dimetilan, Snip	
83.	1-allyl-1-(3,7-dimethyl-octyl)piperodinium: Piproctanyl, Alden, Stremtrol	
84.	1-Benzothiazol-2-yl-1,3-dimethylurea: Methabenzthiazuron, Tribunil	
85.	1-Chloro-1,2-dibromoethane: CDBE	
86.	1-Chloro-2-nitropropane: Lanstan	
87.	1-Hydro-2(1H)-pyridinethione: Omadine, Pyrithione, PTO	
88.	1L-(1,3,4/2,6)-2,3-Dihydroxy-6-hydroxymethyl-4-[(1S,4R,5S,6S)-4,5,6-trihydroxy-3-hydroxy-methylcyclohex-2-enylamino]-cyclohexl-B-D-glucopyranoside: Validamycin(A), Validacin, Valimon	
89.	2(4)-(1-Methylhepthyl)-4,6(2,6)-dinitrophenyl crotonate: Dinocap, DPC, Mildex	
90.	2,-(Dimethylacetyl)-1 H-indene-1,3(2H)-dione: Diphenadione, Diphacinone	
91.	2,2,2-Trichloro-1,1-bis(4-chlorophenyl)ethanol: Dicofol, Kelthane	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
92.	2,2,4,4,6,6-Hexakis(1-aziridinyl)-2,2,4,4,6,6-hexahydro-1,3,5,2,4,6-triazatriphosphorine: Apholate	
93.	2,2-Dimethyl-1,3-benzodioxol-4-yl-methylcarbamate: Bendiocarb	
94.	2,2-Dimethyl-2,3-dehydro-1-benzofuran-7-yl-N-(N-12-ethoxycarbonylisopropylsulfenamoyl)-N-methylcarbamate: Benfuracarb	
95.	2,2-Dimethyl-2,3-dihydro-7-benzofuranyl-N-methylcarbamate: Carbofuran, Furadan, Curaterr	
96.	2,3-Dibromopropionitrile	
97.	2,3-Dihydro-2,2-dimethylbenzofuran-7-yl(dibutylamin)mathylcarbamate: Carbosulfan, Marshal	
98.	2,4,6-Trinitrophenol: Picric acid (excluding explosives)	
99.	2,4-Dichloro-6-nitrophenol	
100.	2,4-Dinitro-6-methyl propylphenydimethyl acrylate: Binapacryl, Morocide	
101.	2,5-Cyclohexadience-1,4-dione: Quinone, 1,4-Benzoquinone	
102.	2,6-Dibromo-4-[(4-nitrophenyl)azo]phenol: BAB	3
103.	2-(1,3-Dioxolan-2-yl)-phenyl methylcarbamate: Dixacarb, Elocron	
104.	2-(1-Methylpropyl)phenyl methylcarnamate: Bassa, BPMC, Fenobucarb	2
105.	2-(2,2-Dimethyl-1-oxopropyl)-1H-idene-1,3(2H)-dion: Pindone, Pival	
106.	2-(2-Chloro-1-methoxyethoxy)phenyl methlcarbamate: Cloethocarb, Lance	
107.	2-(methylthio)propionaldehyde O-methylcarbamoyleoxine: Aldicarb, Temik	
108.	2-(p-tert-Butylphenoxy)cyclohexyl 2-propynyl sulfate: Propargite, Omite	
109.	2-[(4-Chlorophenyl)phenylacetyl]-1H-indene-1,3(2H)-dione: Chlorophacinone, Caid, Laphaidione	0.025
110.	2-[5-Ethyletrahydro-5-[tetrahydro-3-methyl-5-[tetrahydor-6-hydroxy-6-(hydroxymethyl)-3,5-dimethyl-2H-pyran-2-yl]-2-furyl]-2-furyl]-9-hydroxy-B-methoxy-B-methoxy-a,G,2,8-tetramethyl-1,6-dioxaspiro[4,5]decane-7-butyric acid: Monensm	
111.	2-Aminino-3-chloro-1,4-naphthoquinone: ACN, Motgeton, ACNQ	
112.	2-Benzothiazol amine: 2-Aminobenzothiazol	
113.	2-Bromo-2-nitropropane-1,3-diol: Bronopol	
114.	2-Butanone: Methyl ethyl, ketone, MEK	
115.	2-Butenal: Crotonaldehyde	
116.	2-Chloro-1-(2,4-dichlorophenyl)vinyldimethyl phosphate: Dimethylvinphos	
117.	2-Chloro-1-(2,4-dichlorophenyl)vinyldimethyl phosphate: Themivinphos	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
118.	2-Chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate: Phosphamidon, Dimecron	
119.	2-Chloro-4,5-dimethylcarbamate: Carbanolate, Banol	
120.	2-Chloro-4-methyl-6-dimethylaminopyrimidine	
121.	2-Chloro-N-(2-chloroethyl)-N-methylethanamine: Mechlorethamine	
122.	2-Chloroethyltrimethylammonium: Chlormequat, Cycocel	
123.	2-Cyclohexyl-4,6-dinitrophenol: Dinex, DN	0.5
124.	2-Dimethylamino-5,6-dimethyl-4-pyrimidinyl dimethylcarbamate: Pirimor, Pirimicarb	
125.	2-Ethylthioethyl O,O-dimethyl phosphorthioate: Methyldemton, Metasystox	
126.	2-Furancarboxaldehyde: Furfural	
127.	2-Hydroxyethylhydrazine: Omaflora, Brombloom, 2-Hydrazinoethanol	
128.	2-isopropyl-4-methylpyrimidinyl-6-diethyl thiophosphate: Diazion, Dimpylate	
129.	2-Isopropyloxybenzoic acid methylamide	1
130.	2-Isopropyloxyphenyl N-methylcarbamate: Baygon, Propuxur, Unden(e)	1
131.	2-Isopropylphenyl methylcarbomate: Isprocarb, MICP, Etroforan	1.5
132.	2-Isopropylphenyl O,O-dimethylphosphorodithioate: Isothioate, Hosdon	
133.	2-Mesyl-2-Methylpropionaldehyde 0-methylcarbomyloxime: Aldoxycarb, Standak	
134.	2-Methoxy-4H-1,3,2-benzodioxaphosphorin 2-sulfade: Dixabenzofos, Salithion	
135.	2-Propenal: Acrolein	
136.	2-sec-Butyl-4,6-dinitrophenol: Dinoseb, DNBP	
137.	2-sec-Butyl-4,6-dinitrophenyl acetate: Dinoseb acetate, DNBPA	
138.	2-sec-Butyl-4,6-dinitrophenyl isopropyl carbonate: Dinobuton, Acrex, Sytasol	
139.	2-tert-Butyl-4,6-dinitrophenol: Dinoterb	
140.	2-tert-Butyl-5-(4-tert-butylbenzylthio)-4-chloropyridazin-3(2H)-one: Pyridaben	
141.	3,5-Dimethyl-1,3,5-thiadiazinane-2-thione: Dazomet, Tiazon, Basamid	
142.	3,5-Dimethyl-4-methyl thiophenyl methylcarbamate: Methiocarb, Mercaptodimethur	
143.	3,5-Dimethylphenyl N-methylcarbamate: XMC, Macbal	3
144.	3,7,9,13-Tetraazapentadeca-3,12-dien-6,10-dione: Thiocarb, Larvin, Semevin	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
145.	3,7-Dichloro-8-quinoline carboxylic acid: Quinclorac	
146.	3-(2-Chloro-3,3,3-trifluoro-1-prophenyl)-2,2-dimethylcyclopropanecarboxylic acid cyano-(3-phenoxyphenyl)methyl ester: Cyhalothrin, Grenade	
147.	3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea: Linuron, Methoxydiuron, Afalon	
148.	3-(3-Biphenyl-4-yl-1,2,3,4-tetrahydro-1-naphthyl)-4-hydroxy-coumarin: Difenacoum, Ratak	
149.	3-(a-Acetonylbenzyl)-4-hydroxycoumarin: Warfarin, Rodex, Coumarins	
150.	3-(Dimethoxyphosphinyloxy)-N-methylisocrotonamide: Azodrin, Monocrotophos, Apadrin	
151.	3-(Methylthio)butanone O-methylcarbamate: Butocarboxim(e)	
152.	3-[1-(2-Furanyl)-3-oxobutyl]-4-hydroxycoumarin: Coumafuryl, Fumarin	
153.	3-[1-(4-Chlorophenyl)-3-oxobutyl]-4-hydroxy-2H-1-benzopyran-2-one: Coumachlor, Grenade	
154.	3-[2-(3,5-Dimethyl-3-oxocyclohexyl)-2-hydroxyethyl]glutarimide: Cycloheximide, Actidione	0.2
155.	3-[3-(4'-Bromo[1,1-biphenyl]-4]yl)-1,2,3,4-tetrahydro-1-naphthaleny]-4-hydroxy-2H-1-benzopyran-2-one: Brodifacoum, Talon	
156.	3-[3-(4'-Bromobiphenyl-4-yl)-3-hydroxy-1-phenylpropyl]-4-hydroxycoumarin: Bromadiolone, Maki	
157.	3-Buten-2-one: Methyl vinyl ketone	
158.	3-Chloro-1,2-propanediol: Chlorohydrin	
159.	3-Dimethylaminomethyleneaminophenyl methylcarbamate: Formethenate, Dicarzol	
160.	3-Hydro-2-pentenedioic acid dimethyl eater dimethyl phosphate: Bomyl, Swat	
161.	3-Methyl-1-(1-methylethyl)-1H-pyrazol-5-yl-dimethyl-carbamate: Isolan	
162.	3-Methyl-5-isopropylphenyl-N-methylcarbamate: Promecarb(e), Carbamult	
163.	4,6-Dinitro-0-cresol: DNOC, Antinonnin, Sinox	
164.	4-(2-Chlorophenylhydrazone)-3-methyl-5-isozazolone: Drazoxolon, Ganocide	
165.	4-(Dimethylamino)-3,5-dimethylphenyl methylcarnamate: Mexacarbate, Zectran	
166.	4-Amino-6-tert-butyl-4,5-dihydro-3-methylthio-1,2,4-triazin-5-one: Metribuzin(e), Lexone, Sencor	
167.	4-Diallylamino-3,5-dimethylphenyl N-methylcarbamate: APC, Hydrol, Allyxycarb	
168.	4-Dimethylamino-m-tolymethyl carbamate: Acephate, Orthene	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
169.	4-Ethylthiophenyl methylcarbamate: Toxamate, EMPC	
170.	4-Hydroxy-3,5-di-iodobenzonitrile: Ioxynil, Actril	3
171.	4-Hydroxy-3-(1,2,3,4-tetrahydro-1-naphthyl)coumarin: Coumatetral, Racumin	
172.	4-Hydroxy-3-(1,2,3,4-tetrahydro-3[4-(4-trifluoromethylbenzyloxy)phenyl]-1-naphthyl]coumarin: Flocoumafen, Storm, Stratagem	
173.	4-Indol-3-yl-butyric acid: IBA, Seradix, Rootone F	
174.	5,10-Dihydro-5,10-dioxonaphto[2,3-b]-1,4-dithin-2,3-dicarbonitrile: Dithianone, Delan	
175.	5,5-Dimethyl-3-oxocyclohex-1-enyl dimethylcarbamate: Dimetan	
176.	5-(a-Hydroxy-a-2-Pyridybenzyl)-7-(a-2-pyridylbenzylidene)-5-norbornene-2,3-dicarboximide: Norbormide, Raticate, Shoxin	
177.	5-[(3-Carboxy-4-hydroxyphenyl)(3-carboxy-4-oxo-2,5-cyclohexadion-1-yli-done)methyl]-2-hydroxybenzoic acid triammonium salt: Aluminon, Lysofon	
178.	5-Amino-3-phenyl-1H-1,2,4-triazol-1-yl-N,N,N',N'-tetramethylphosphonic diamide: Triamiphos	
179.	5-Benzyl-3-furylmethyl(IRS)-cis,trans-chrysabthemate: Resmethrin, Chryson, Benzyfuroline	
180.	5-Methyl-1,2,4-triazolo[3,4-b]benzothiazole: Tricyclazole, Beam, Blaside	4
181.	6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzo-dioxathiepin 3-oxide: Endosulfan, Thioadan, Chlorthiepin	
182.	6-Methyl-1,3-dithiolo-[4,5,b]-quinoxalin-2-one: Chinomethionate(e), Quiome-thionate, Morestan	
183.	6-tert-Butyl-2,4-dinitro-m-tolylacetate: Medinoterb acetate	
184.	7-Bromo-6-chloro-3[3-(3-hydroxy-2-piperidyl)-2-oxypropyl]-4(3H)-quinazo-line: Halofuginone	
185.	7-Chlorobicyclo[3.2.0]hepta-2,6-dien-6-yl dimethylphosphate: Heptenophos, Ragadan, Hostaquick	
186.	7-Oxybicyclo[2.2.1]heptane-2,3-dicarboxylic acid: Endothal(1)	
187.	9,10-Secocholesta-5,7,10(19)-trien-3-ol: Vitamin D3, Activated 7-dehydrocho-lesterol, Ebivit	
188.	a-Naphthyl thiourea: ANTU, Bantu, Krysidi	
189.	a,a,a-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine: Trifluralin, Treflan, Elan-colan	
190.	a-Amino-3-hydroxy-5-isoxazoleacetic acid: Ibotenic acid	
191.	a-Cyano-m-phenoxybenzyl-a-isopropyl-p-chlorophenyl acetate: Fenvalerate	
192.	A-Ethylthio-0-tolyl methylcarbamate: Ethiofencarb, Croneton	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
193.	Acetylene dicarboxamide: Cellocidin, Lenamycin, 2-Butynediamide	
194.	Acrylamide: Porpenamide	
195.	Acrylonitrile: 2-Propenenitrile, Vinyl cyanide	
196.	Alkanolammonium 2,4-dinitro-6-(1-methylpropyl) phenolate	
197.	Aluminum phosphide: Celphos, Phostoxin (or any substance having aluminum phosphide solving accelerator)	
198.	Ammonia	10
199.	Ammonium hydrogen fluoride: Ammonium bifluoride	
200.	Aniline	
201.	Antimony compound	
202.	Arsenic	
203.	B-Naphthol	1
204.	B-Fluoroethyl acetate	
205.	Barium compound (excluding barium sulfate)	
206.	Benzene	
207.	Bichromate	
208.	Bis[tris(2-methyl-2-phenylpropyl)tin] oxide: Fenbutatin oxide, Vendex, Osdaran	
209.	Bromine	
210.	Bromo-2-propane: Bromoaceone	
211.	Butyl-2,3-dimethylbenzofuran-7-yl N,N'-dimethyl-N,N'-thiodicarbamate: Furthiocarb, Deltanet	
212.	Butyl-S-benzyl-S-ethyl dithiophosphate: Conen, BEBP	
213.	Cadmium compound	
214.	Calcium methanarsonic acid: MAC	
215.	Carbon disulfide	
216.	Carbon tetrachloride	
217.	Chlorinated 2,2-dimethyl-3-methylenebicyclo[2.2.1]heptane: Campechlor, Chlorinated camphene, Texaphene	
218.	Chloroacetic acid: MCA	
219.	Chloroform	
220.	Chloromethyloxirane: Epichlorohydrin	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
221.	Chlorosulfonic acid	
222.	Chromic acid	
223.	Chromic anhydride	
224.	Chromium acetate	
225.	cis, trans-3-chloro-4-[4-methyl-2-(1H-1,2,4-triazol-1-ylmethyl)-1,3-dioxolan-2-yl]phenyl 4-chlorophenyl ether: Difenoconazole	
226.	Complex compound of calcium methyldichlorovinyl phosphate and dimethyldichlorovinyl phosphate: Cargurophos	
227.	Cresol: Methyl phenol, oxytoluene	
228.	Curare: Urari	
229.	Curarine	
230.	Cyclotrimethylenetrinitramine: Cyclonite, RDX, Hexogen	
231.	Di(2-chloroisopropyl) ether	
232.	Diacetoxypropane: DAP	
233.	Dichloroacetic acid	
234.	Dichlorobenzenediazothioureea: Chlorothiophos, Muritan, Promurit	
235.	Dichlorobenzoic acid	15
236.	Dichloronitroethatn: GASPA, NET	
237.	Diethyl (4-methyl-1,3-dithiolan-2-ylidene)phosphoramidate: Mephosfolan, Cytrolane	
238.	Diethyl 1,3-dithiolan-2-ylidenephosphoramidate: Fosthiethan, Acconem, Geofos	
239.	Diethyl 1,3-dithiolan-2-ylidenephosphoramidate: Phosfolan, Cyolane, Cylan	
240.	Diethyl 5-methyl-3-pyrazolylphosphate: Pyrazoxoan	
241.	Diethyl S-benzylthiophosphate: EBP, Kitzin	2.3
242.	Diethyl(5-phenyl-3-isoxazolyl)thiophosphate: Isoxathion, Karphos	
243.	Diethyl-1-(2,4-dichlorophenyl)-2-chlorovinyl phosphate: Chorbenvinphos	
244.	Diisopropyl fluorophosphate: Isofluorphate, DFP	
245.	Diisopropyl S-(ethylsulfinylmethyl)dithiophosphate: Aphidan, IRSP	5
246.	Dimethyl(E)-2-dimethylcarbamonyl-1-methylvinyl phosphate: Ektafos, Dicrotopos, Birdin, Carbicron	
247.	Dimethyl 2,2,2-trichloro-1-hydroxyethylphosphonate: Dipterex, Trichlorfon, Chlophos	10

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
248.	Dimethyl sulfate	
249.	Dimethyl terephthalate	
250.	Dimethyl(E)-1 methyl-2-(1-phenylethoxycarbonyl)vinyl phosphate: Crotoxyphos, Ciodrin	
251.	Dimethyl(E)-1-methyl-2-(methylcarbamoxyl)vinyl phosphate: Azodrin, Monocrotophos	
252.	Dimethyl-2,2-dichlorovinylphosphate: Dichlorvos, DDVP	
253.	Dimethyl-S-(p-chlorophenyl)thiophosphonate: DMCP, Fujithion	
254.	Dimethylphenol: Xylenol	5
255.	Dimethylsulfinylisopropyl thiophosphate	
256.	Dipropyl-4-methylthiophenyl phosphate: Kayphos, Propaphos	
257.	Dodecylguanidine acetate: Dodine, Carpene, Cyprex	
258.	Ethyl 2-diethoxythiophosphoryloxy-5-methylpyrazolo[1,5a]pyrpyrimidine-6-carboxylate: Pyrazophos Afugan, Missile	
259.	Ethyl 4-(methylthio)-m-tolyl isopropylphosphoranmidate: Fenamiphos, Nemacur	
260.	Ethyl acetate	
261.	Ethyl bromide	
262.	Ethyl chloride	
263.	Ethyl 0-benzoyl 3-chloro-2,6-dimethoxybenzohydroximate: Benzoximate, Citrazon, Aazomate	
264.	Ethyl thiocyanoacetate: REE, Sassen	1
265.	Ethylene chlorohydrin: 2-chloroethanol	
266.	Ferric methanardonic acid: MAF	
267.	Fluroboacetic acid	
268.	Fluroboacetic acid amide: Fussol, Fluoroacetamide	
269.	Fluroboacto-p-bromoaniline: FABA	
270.	Fluroboric acid	
271.	Flurosilicic acid	
272.	Formalin	1
273.	Fuming sulfate acid: Oleum	
274.	G-2,c-4,c-6,c-8-Tetraethyl-1,3,5,7-etraoxocane: Metaldehyde	
275.	Hexachlorocyclohexane: BHC, HCH	1.5

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
276.	Hexaethyl tetraphosphate	
277.	Hydrazine hydrate	
278.	Hydrochloric acid	10
279.	Hydrogen bromide	
280.	Hydrogen chlorate (excluding explosive)	
281.	Hydrogen fluoride	
282.	Hydrogen iodine	
283.	Hydrogen peroxide	6
284.	Hydrogen phosphide: Phosphine	
285.	Hydroxylamine	
286.	I-Naphthyl methylcarbamate: Carbaryl, Seven, Arylam	5
287.	Inorganic copper (excluding fulminating copper and copper fulminate)	
288.	Inorganic cyanide compound (excluding ferric ferricyanide, fhodan compound, and calcium cyanamide)	
289.	Inorganic gold (excliding fulminading gold and gold fulminate)	
290.	Inorganic silver (excluding silver chloride and silver fulminate)	
291.	Inorganic tin	
292.	Inorganic zinc (excluding zincc carbonate and zinc fulminate)	
293.	Iodine	
294.	L-2-Amino-4[(hydroxymethyl)phosphinoyl]-butyryl-L-ala-nyl-L-alanine: Phosphinothricylalanylalanine	19
295.	Lasalocid	2
296.	Lead compound (excluding lead tetroxide, lead sulfate, basic lead carbonate)	
297.	m-(l-Methylbutyl)phenylmethyl carbamate mixture with m-(1-Ethylpropylphe-nyl carbamate (3:1): Bufencarb, Metalkamate	
298.	m-Toly methylcarbamate: metolcarb, Tsumacide, MTMC	2
299.	Magnoliaceae illicium religiosum siebet zuec	
300.	Mercury	
301.	Methyl alcohol: Methanol	
302.	Methyl bromide	
303.	Methyl chloride (NOTE: Pesticides in a container (300 mL or smaller) with 50% or less of methyl chloride are excluded.)	50

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
304.	Methyl iodine	
305.	Methyl isothiocyanate: Trapex, MITC	
306.	Methyl N-(2,6-dimethylphenyl)-N-(2-methoxyaceytl)-DL-alaninate: Metalxyl, Ridomil, Apron	
307.	Methylene bisthiocyanate	
308.	Methylhydrazine	
309.	Methylsulfonal	
310.	Molybdenum trioxide	
311.	N'-(2-Methyl-4-chlorophenyl)-N,N-dimethylformamidine: Chlorodimeform, Galecron, Fundal	3
312.	N'N"-Diisopropyl-6-methylthio-1,3,5-trazine-2,4-diamine: Prometryn(e), Gesagard, Caparol	
313.	N,N-Dimethyl-1,2,3-trithian-5-ylamine: Thiocyclam(e), Evisekt	3
314.	N,N-Dimethyl-2,2-diphenyl acetamide: Diphenamide	
315.	N,N-Dimethyl-2-methylcarbamoyloxyimino-2(methylthio) acetamide: Oxamyl, Vydate	
316.	N-(1,1,2,2-Tetrachloroethylthio)cyclohex-4-ene-1,2-dicarboximid: Captafol, Difolatan	
317.	N-(3-Chloro-4-Chlorodifluoromethylthiophenyl)-N,N-dimethyl-urea: Thio-chloromethyl	12
318.	N-(N-Trichloromethylthio)phthalimide: Folpet, Phaltan	
319.	N-(p-Bromobenzyl) monofluoroacetamide	
320.	N-[(Dichlorofluoromethyl)thio]-N',N'-dimethyl-N-phenyl sulphamide: Dichlo-fluanid, Elvaron, Euparen(e)	
321.	N-Alkylaniline	
322.	N-Alkyldimethylbenzyl ammonium chloride	
323.	N-Alkyltoluidine	
324.	N-Bromo-N'-chloro-5,5-dimethylhydanatoin: Halogenated hydantoin	
325.	N-Butylpyrolidine	
326.	N-Methyl-2,4-dinitro-N-(2,4,6-tribromophenyl)-6-(trifluoromethyl) benze-namine: Bromethaline(e)	
327.	N-Methyl-N-(1-naphthyl) monofluoroacetoamide: MNFA, Nissol	
328.	N-Methylcarbamyl-2-chlorophenol: Etrofol, CPMC, Hopcid	2.5

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
329.	N-tert-Butyl-6-chloro-N'-ethyl-1,3,5-triazine-2,4-diamine: Gardoprim, Terbuthylazine	
330.	Nickel carbonyl	
331.	Nicotene	
332.	Nitric acid	
333.	Nitrobenzene	
334.	Nitrous acid	
335.	O,O,O',O'-Tetraethyl dithiopyrophosphate: Sulfotep, Bladafum	
336.	O,O,O',O'-Tetraethyl S,S'-methylene bis(phosphorodithioate): Ethion, Dithon	
337.	O-(5-Chloro-1-isopropyl-1H-1,2,4-triazol-3-yl)O,O-dieyhyl phosphorothioate: Isazofos, Miral	
338.	O-2-Chloro-4-methylthiophenyl O-methyl ethylphosphoramidothioate: Mitemate, Amidothioate	
339.	O-Ethyl 4-(methylthio)phenyl s-propyl dithiophosphate: Sulprofos, Bolstar, Helothion	3
340.	O-Ethyl O-2,4,5-trichlorophenyl ethylphosphonothioate: Trichloronate, Agrisil, Phytosol	
341.	O-Ethyl O-2-isopropoxycarbonylphenyl isopropylphosphoramidothioate: Isofenphos, Oftanol, Amaze	
342.	O-Ethyl O-4-nitrophenyl phenylphosphonothioate: EPN	
343.	O-Ethyl S, S-diphenyl phosphorodithioate: EDDP, Edifenphos, Hinosan	2
344.	O-Ethyl S, S-dipropyl phosphorodithioate: Ethoprophos, Mocap, Prophos	
345.	O-Ethyl S-Phenyl-(R,S)-ethylphosphonodithioate: Fonofos, Dyfonate	
346.	Octamethylphyrophosphoramide: Schradan, OMPA, Sytam	
347.	Other poisonous substances designated by the Minister of Environment	
348.	Oxalic acid	
349.	p-Chloropheyldiazothiourea	
350.	p-Dimethylaminobenzenediazosulfonate	
351.	Pentachlorophenol	1
352.	Phenol	5
353.	Phenylenediamine	
354.	Phenylhydrazine: Hydrazinobenzene	
355.	Phenyl N.N'-dimethylphosphorodiamidate: Diamidafos	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
356.	Phosphorothioic acid O,O-dithyl O-(7,8,9,10-tetrahydro-6-oxo-6H-dibenzo[b,d]pyran-3-yl)ester: Coumithioate, Dithion, Dition	
357.	Phosphorus sulfide	
358.	Poly[oxyethylene(dimethylimino)ethylene(dimethylimino)ethylene dichloride]: WSCP	
359.	Potassium	
360.	Potassium hydroxide	5
361.	Potassium, Sodium, Alloy of potassium and sodium	
362.	Propylene oxide	
363.	Rotenone	2
364.	S,S'-(1,4-Dioxane-2,3-diyl)0,0,0',0'-tetraethyldi(phosphorodithioate): Dioxathion, Delnav, Deltic	
365.	S,S'-Dimethyl 2-difluoromethyl-6-trifluoromethylpyridine-3,5-dicarbothioate: Dithiopyr	
366.	S,S,S-Tributylphosphorotrithioate	
367.	S-(2-Methyl-1-piperidyl carbonymethyl)dipropyl dithiophosphate: Piperophos, Avirosan, Rilof	4.4
368.	S-(4-Methylsulfonyloxyphenyl)-N-methylthiocarbamate	
369.	S-(N-Ethoxycarbonyl-N-methylcarbamoylmethyl)0,0-diethylphosphorodithioate: Mercarbam, Affos, Murfotox	
370.	S-(N-Formyl-N-methylcarbamoylmethyl)0,0-dimethyl phosphorodithioate: Formothion, Anthio, Aflix	
371.	S-[[(1,1-dimethylethyl)thio]methyl] 0,0-diethyl phosphorodithioate: Terbufos, Counter	
372.	S-[2-(Diethylamino)ethyl] 0,0-diethylphosphorothioate: Amiton, Tetram	
373.	S-2,5-Dichlorophenylthiomethyl 0,0-diethylphosphorodithioate: Phencapton	1.5
374.	S-2-Benzenesulphonaminoethyl 0,0-diisopropylphosphorodithioate: Bensulide, Betasan, Prefar	
375.	S-2-Chloro-1-phthalimidoethyl 0,0-dithyl dithiophosphate: Dialifos, Dialifor, Torak	
376.	S-2-Ethylsulfinyl-1-methylethyl 0,0-dimethyl phosphorothioate: ESP, Estox, Oxydeprofos, Metasystox S	
377.	S-2-Ethylsulfinyl-1-methylethyl 0,0-dimethyl phosphorothioate: Oxydemeton-methyl, Metasystox R	
378.	S-2-Ethylsulfonylethyl 0,0-dimethyl phosphorothioate: Demeton-S-methyl sulfone, Metaisosystoxsulfon	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
379.	S-2-Ethylthioethyl 0,0-dimethyl phosphorodithioate: Thiometon, Ekatin	
380.	S-4-Chlorophenylthiomethyl 0,0-methyl dithiophosphate: Carbophenothion, Trithion	
381.	S-4-Chlorophenylthiomethyl 0,0-methyl phosphorodithioate: Methyltrithion, Tri-Me	
382.	S-5-Methoxy4-oxo-4H-pyran-3-ylmethyl 0,0-dimethyl phosphorothioate: Endothion, Endocide	
383.	S-6-Chloro-2,3-dihydro-2-oxobenzoxazol-3-ylmethyl 0,0-diethyl phosphorodithioate: Phosalone, Zolone	2.2
384.	S-a-(Ethoxycarbonyl)benzyl 0,0-dimethyl phosphorodithioate: PAP, Phenthoate, Cidial	3
385.	S-Chloromethyl 0,0-diethyl phosphorodithioate: Chlormephos, Dotan	
386.	S-Ethyl N,N-hexamethylenethiocarbamate: Molinate, Ordram	
387.	S-Methyl N-[(methycarbamoyl)oxy]thioacetoimidate: Methomyl, Lannate	
388.	Salinomycin	1
389.	Sea onion: Squill, Bulbusscillae, Meerzwiebel	
390.	Selenium	
391.	Sodium	
392.	Sodium aluminum fluoride: Cryolite, Kryolith	
393.	Sodium cyanate	
394.	Sodium Fluoride	
395.	Sodium hydroxide	5
396.	Sodium peroxide	5
397.	Sodium-2-pyrimidinethiol 1-oxide	
398.	Strychnidin-10-one: Strychinine	
399.	Sulfonal	
400.	Sulfur	
401.	Sulfuric acid	10
402.	Sulfuryl fluoride	
403.	Tert-Butyl(e)-a-(1,3-dimethyl-5-phenoxypyrazol-4-ylmethyleneamino-oxy)-p-toluate: Fenpyroximate	
404.	Tetraalkyl lead	
405.	Tetrachloroisophthalonitrile: Chlorothalonil, TPN, Bravo	

(continued)

Table 3-2 (continued)

Number*	Chemical Name	Percentage**
406.	Tetrachloronitriethane	
407.	Tetraethyl pyrophosphate: TEPP, Tetron, Vpotone	
408.	Tetramethyl phosphorodiamidic fluoride: Dimefox	
409.	Tetramethylthiuram disulfide: Thiram(e), TMTD, Thiuram	
410.	Thallium acetate	
411.	Thallium nitrate	
412.	Thallium sulfate	
413.	Thiosemicarbazide	
414.	Toluene	
415.	Toluenediamine	
416.	Toluidine	
417.	Tri(cyclohexyl)-1H-1,2,4-triazol-1-yl tin: Azocyclotin, Peropal	
418.	Triaryl tin hydroxide	2
419.	Tributyl(2,4-dichlorobenzyl)phosphonium ion: Chlorphonium, Phosfon, Phosfleur	
420.	Trichloroacetic acid	
421.	Trichloronitroethylene	
422.	Trichloronitromethane: Chloropicrin	
423.	Tricyclohexatin hydroxide: Cyhexatin, TCTH, Plictran	
424.	Trifluoromethanesulfonic acid	10
425.	Trilkyl tin hydroxide	2
426.	Trithiocycloheptadiene-3,4,6,7-tetranitrile: TCH	15
427.	Urea peroxide	17
428.	Xylene: Dimethylbenzene, Xylol	
429.	Yellow phosphorus: phosphorus	
430.	Zinc dimethyldithiocarbamate: Zirem	
431.	Zinc methyldithiocarbamate	
432.	Zinc phosphide	

* Chemical concentrations are 1 percent if not listed.

**Chemical is not regarded as "hazardous" if its concentrations are less than the listed percentage (if given).

Table 3-3

Bilingual Labels and Placards Form Numbers

(FGS-ROK Table 5-3)

Form Name	Form Number	Remarks
Explosive	EA Label 124EK	DOT Label
Explosive 1.4	EA Label 118EK	DOT Label
Blasting Agent 1.5	EA Label 126EK	DOT Label
Explosive 1.6	EA Label 125EK	DOT Label
Flammable Gas	EA Label 91EK	DOT Label
Non-flammable Gas	EA Label 92EK	DOT Label
Poison Gas	EA Label 95EK	DOT Label
Flammable Liquid	EA Label 93EK	DOT Label
Flammable Solid	EA Label 94EK	DOT Label
Spontaneously Combustible	EA Label 85EK	DOT Label
Dangerous When Wet	EA Label 90EK	DOT Label
Oxidizer	EA Label 89EK	DOT Label
Organic Peroxide	EA Label 86EK	DOT Label
Poison	EA Label 96EK	DOT Label
Harmful (Stow Away From Foodstuffs)	EA Label 127EK	DOT Label
Infectious Substance	EA Label 133EK	DOT Label
Radioactive I	EA Label 130EK	DOT Label
Radioactive II	EA Label 131EK	DOT Label
Radioactive III	EA Label 132EK	DOT Label
Corrosive	EA Label 87EK	DOT Label
Class 9	EA Label 137	DOT Label
Empty	EA Label 128	DOT Label
Packaging Orientation	EA Label 129	DOT Label
Explosive	EA Label 98EK	DOT Placard
Explosive 1.4	EA Label 98-1EK	DOT Placard
Blasting Agent 1.5	EA Label 99EK	DOT Placard
Explosive 1.6	EA Label 98-2EK	DOT Placard
Flammable Gas	EA Label 101EK	DOT Placard

(continued)

Table 3-3 (continued)

Form Name	Form Number	Remarks
Non-flammable Gas	EA Label 100EK	DOT Placard
Poison Gas	EA Label 102EK	DOT Placard
Oxygen	EA Label 113EK	DOT Placard
Flammable	EA Label 103EK	DOT Placard
Combustible	EA Label 104EK	DOT Placard
Flammable Solid	EA Label 105EK	DOT Placard
Spontaneously Combustible	EA Label 112EK	DOT Placard
Dangerous When Wet	EA Label 114EK	DOT Placard
Oxidizer	EA Label 107EK	DOT Placard
Organic Peroxide	EA Label 135EK	DOT Placard
Poison	EA Label 108EK	DOT Placard
Harmful (Keep Away From Foodstuffs)	EA Label 136EK	DOT Placard
Radioactive	EA Label 109EK	DOT Placard
Corrosive	EA Label 110EK	DOT Placard
Class 9	EA Label 115EK	DOT Placard
Dangerous	EA Label 97EK	DOT Placard
Asbestos	EA Label 134EK	OSHA Label
PCBs (6" x 6")	DRMO Form 21	PCB Label

Table 3-4

Maximum Allowable Capacity of Containers and Portable Tanks for Hazardous Materials

(AFOSH STD 127-43, Table 1)

Container Type	Flammable Liquids			Combustible Liquids	
	IA	*IB*	*IC*	*II*	*II*
Glass or approved plastic[1]	1 pt[2]	1 qt[2]	1[3]	1	1
Metal (other than Department of Transportation (DOT) drums))	1	5	5	5	5
Safety cans	2	5	5	5	5
Metal drums (DOT specifications)	60	60	60	60	60
Approved portable tanks	660	660	660	660	660

[1] Nearest metric size is also acceptable for the glass and plastic containers listed.

[2] One gallon or nearest metric equivalent size may be used if metal containers must be avoided because of chemical reaction with their contents.

[3] Quantities are in gallons for the rest of this table.

Table 3-5

Storage of Hazardous Materials in Inside Rooms

(AFOSH STD 127-43, Table 2)

Fire Protection Provided[1]	Fire Resistance	Maximum Size	Total Allowable Quantities[2] (gal/ft^2 floor area)
Yes	2 h	500 ft^2	10
No	2 h	500 ft^2	4
Yes	1 h	150 ft^2	5
No	1 h	150 ft^2	2

[1] Fire protection system will be sprinkler, water spray, or other approved method.

[2] If metric containers are being stored, use the nearest metric equivalent.

Table 3-6

Indoor/Outdoor Storage for Flammable/Combustible Materials

(DOD 4145.19-R-1, Tables 5-1 through 5-4)

Indoor Container Storage			
Class Liquid	*Storage Level*	**Protected Storage Maximum per Pile In Gallons*	*Unprotected Storage Maximum per Pile In Gallons*
IA	Ground and upper floors	2750 (50)	600 (12)
	Basement	Not permitted	Not permitted
IB	Ground and upper floors	5500 (100)	1375 (25)
	Basement	Not permitted	Not permitted
IC	Ground and upper floors	16,500 (300)	4125 (25)
	Basement	Not permitted	Not permitted
II	Ground and upper floors	16,500 (300)	4125 (75)
	Basement	5500 (100)	Not permitted
III	Ground and upper floors	55,000 (1000)	13,750 (250)
	Basement	8250 (450)	Not permitted

*A sprinkler or equivalent fire protection system installed in accordance with NFPA Standard 30.

NOTES:

1. When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.

2. Aisles must be provided so that no container is more than 4 m (12 ft) from an aisle. Main aisles must be at least 2 m (8 ft) wide and side aisles at least 1 m (4 ft) wide. (Numbers in parentheses indicate the number of 55-gal [≈208-L] drums.)

3. Each pile must be separated from each other by at least 1 m (4 ft).

(continued)

Outdoor Container Storage				
Class Liquid	*Maximum per pile [1] (gal)*	*Distance between piles [2] (ft)*	*Distance to property line that can be built upon [1,3] (ft)*	*Distance to street, alley, public way [4] (ft)*
IA	1100	5	20	10
IB	2200	5	20	10
IC	4400	5	20	10
II	8800	5	10	5
III	22,000	5	10	5

[1] When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.

[2] Within 200 ft [≈61 m] of each container, there must be a 12 ft [≈4 m] wide accessway to permit access to fire control apparatus.

[3] The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 must be doubled.

[4] When total quantity stored does not exceed 50 percent of maximum per pile, the distance in columns 4 and 5 may be reduced 50 percent, but not to less than 3 ft [≈1 m].

(continued)

Indoor Portable Tank Storage			
Class Liquid	*Storage Level*	**Protected Storage Maximum per Pile In Gallons*	*Unprotected Storage Maximum per Pile In Gallons*
IA	Ground and upper floors Basement	Not permitted Not permitted	Not permitted Not permitted
IB	Ground and upper floors Basement	20,000 Not permitted	2000 Not permitted
IC	Ground and upper floors Basement	40,000 Not permitted	5500 Not permitted
II	Ground and upper floors Basement	40,000 20,000	5500 Not permitted
III	Ground and upper floors Basement	60,000 20,000	22,000 Not permitted

*A sprinkler or equivalent fire protection system installed in accordance with NFPA Standard 30.

NOTES:

1. When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.

2. Aisles must be provided so that no container is more than 4 m (12 ft) from an aisle. Main aisles must be at least 2 m (8 ft) wide and side aisles at least 1 m (4 ft) wide.

3. Each pile must be separated from each other by at least 1 m (4 ft).

(continued)

Table 3-6 (continued)

Outdoor Portable Tank Storage				
Class Liquid	*Maximum per pile* [1] *(gal)*	*Distance between piles* [2] *(ft)*	*Distance to property line that can be built upon* [1,3] *(ft)*	*Distance to street, alley, public way* [4] *(ft)*
IA	2200	5	20	10
IB	4400	5	20	10
IC	8800	5	20	10
II	17,600	5	10	5
III	44,000	5	10	5

Table 3-7

Specifications for Hazardous Material Signs
(FGS-ROK, Chapter 5, Figures 5.1 through 5.3)

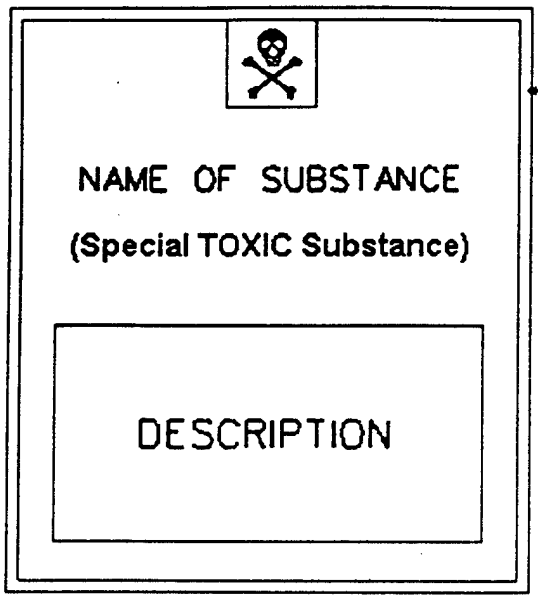

Figure 5.1.1

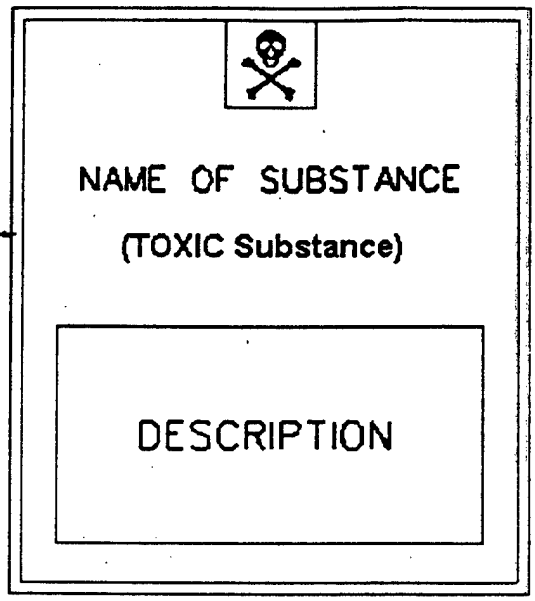

Figure 5.2.1

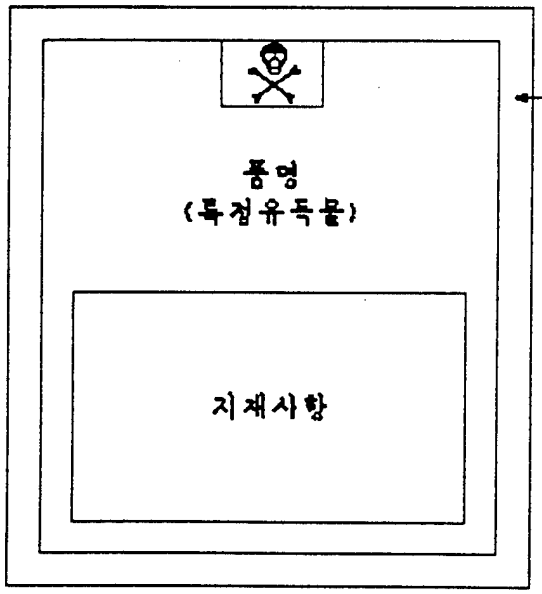

Figure 5.1.2

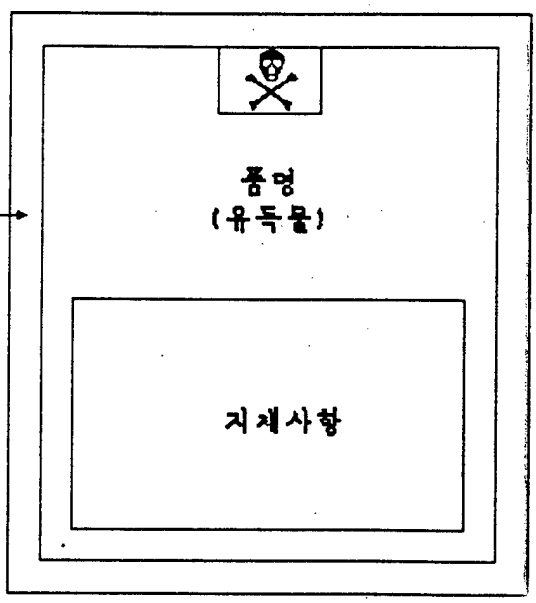

Figure 5.2.2

(continued)

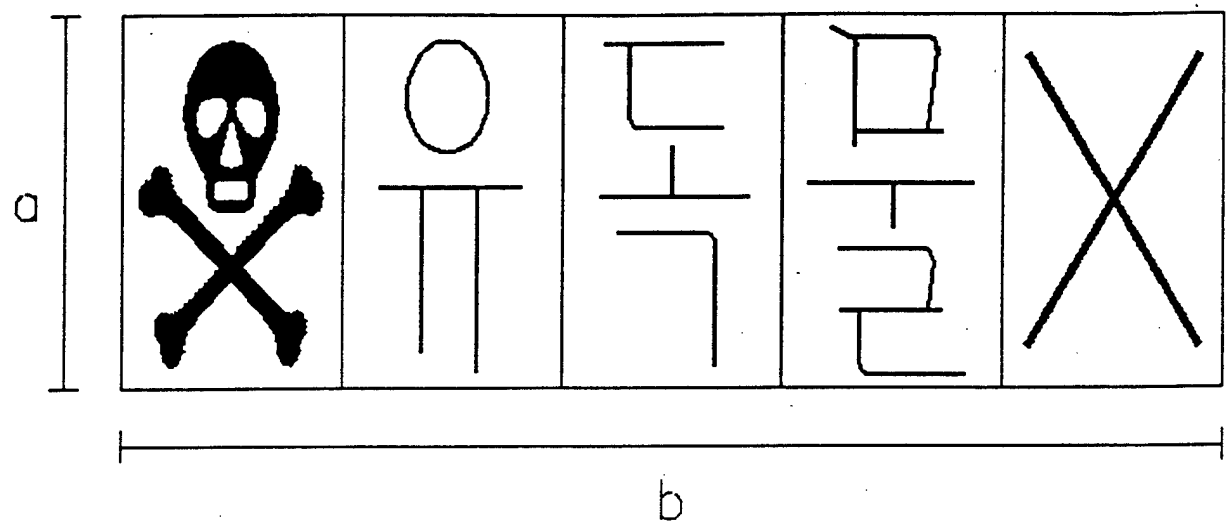

Figure 5.3

(a) Size
a= 20 - 30 cm
b= 80 - 100 cm

(b) Color
· figures: black
· letters: red

INSTALLATION:	COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 4

HAZARDOUS WASTE MANAGEMENT

Korea ECAMP

SECTION 4

HAZARDOUS WASTE MANAGEMENT

A. Applicability of this Section

This section applies to U.S. Air Force (USAF) installations that generate, store, treat, or dispose of any type of hazardous waste.

The regulatory requirements in this section are based on Department of Defense (DOD) regulations, Air Force Regulations (AFRs), and Air Force Instructions (AFIs) that apply at overseas installations. Management practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 6, addresses the management of hazardous waste. It includes criteria for the identification, accumulation, storage, transportation, and disposal of hazardous waste.

C. U.S. Air Force Documents

- AFI 48-119, *Medical Service Environmental Quality Programs*, 25 July 1994, provides directive requirements for the Medical Service Environmental Quality Programs. Included are responsibilities in cleanup, compliance, conservation, and pollution prevention.

- AF Hazardous Waste Management Policy Letter, 6 June 1991, provides guidance on the management of hazardous waste, employee training, turn-in and disposal procedures, contracting, and pollution prevention.

- AF Policy Letter, 21 January 1994, *Air Force Policy on the Application of the Resources Conservation and Recovery Act to Conventional Explosive Ordnance Operations*, addresses the issue of when waste ordnance is to be handled as a hazardous waste; only that portion of the letter that specifies the procedures for identifying when conventional explosive ordnance becomes a waste is applicable to AF components located outside the United States and its territories.

D. Responsibility for Compliance

- The Installation Commander (IC) - The installation commander is responsible for establishing and maintaining an active surveillance program of users, generators, transporters, and storers of hazardous wastes; for the waste minimization program; and for disposal activities. By DOD direction, the IC is responsible for compliance with host nation regulations involving host and tenant organizations on the installation. In either case, operational responsibility for the hazardous waste program rests with the activities that generate, treat, store, transport, or dispose of the waste and the activities responsible for implementing health, safety, and environmental protection programs.

- The Installation Environmental Protection Committee (EPC) - The EPC is responsible for reviewing and coordinating the IC's hazardous waste program. The EPC reviews summary data on waste generation, personnel training, and disposal practices.

- The Base Civil Engineer (BCE) or designated Environmental Management Office (EMO) - The BCE/EMO develops installation-specific policy for all aspects of hazardous waste management for all activities on the installation, including AF and non-AF tenants. The BCE/EMO: manages the hazardous waste program; reviews all hazardous waste storage, treatment, and disposal facilities and ensures their compatibility with hazardous waste regulations; serves as Office of Primary Responsibility (OPR) for developing and implementing the hazardous waste management plan; identifies to the contracting office those hazardous wastes that the installation elects to dispose of by local contract, along with the necessary conditions the contractor is required to meet; and approves siting and design of all hazardous waste management facilities.

- Base Fire Department - This department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible for making periodic fire safety inspections of hazardous waste storage areas and accumulation points on the installation.

- Civil Engineering Environmental Planning Function or EMO Subgroup - The environmental planner is responsible for monitoring day-to-day hazardous waste management activities, maintaining hazardous waste files, and establishing procedures for transfer of accountability and/or custody of hazardous waste from the generating activity to the Defense Reutilization and Marketing Office (DRMO).

- Bioenvironmental Engineering Services (BES) - BES reviews workplace processes and practices to ensure all hazardous materials/wastes are identified; conducts or arranges for environmental monitoring as required; interprets monitoring results for health risks; reviews plans to build or modify facilities used to treat, store, or dispose of hazardous wastes; reviews all material requests for issues of stock classes listed in Federal Standard 313; and maintains a master file of material safety data sheets (MSDSs).

- The Environmental Health Officer (EHO) - The EHO conducts Hazardous Communication Training for all supervisors who have personnel who handle hazardous materials.

- The Supply Officer - The supply officer: receives, stores, and issues hazardous materials; ensures that turn-in hazardous waste documents contain information necessary to comply with all regulatory requirements; and ensures all hazardous materials are properly labeled.

- The Ground Safety Officer - The ground safety officer performs workplace safety inspections, monitors hazardous conditions, and performs occupational safety training.

- The Transportation Officer - The transportation officer coordinates as necessary with shipping activities to ensure hazardous wastes are properly labeled, packaged, manifested, and transported in appropriate vehicles (contract or AF-owned vehicles).

- The Deputy Commander for Maintenance (DCM)/Chief of Maintenance - The DCM ensures that nonhazardous/nontoxic materials are used where possible; maintains a list of hazardous materials used in the work area by shop and maintenance-related task; ensures personnel are properly trained

in ordering, using, handling, controlling, and storing hazardous materials and wastes; and ensures hazardous waste is properly labeled.

- Hazardous Waste Generators - Generators manage hazardous waste in their custody, including proper storage, inspection, recordkeeping, labeling of containers, and transfer for disposal.

- Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Operators - Each TSDF operator is responsible for ensuring compliance with hazardous waste regulations applicable to the facility, including maintaining operational and training records.

- Defense Reutilization and Marketing Office (DRMO) - This agency may or may not be located on the installation, but it is the single agency designated by DOD to provide hazardous waste disposal service on a pay for services rendered basis to the installation. The DRMO is responsible for compliance with all host nation national and local regulations, and AF (including base guidance) regulations at its storage/disposal facility. The DRMO is not in the scope of the assessment unless it is located on the installation.

E. Definitions

- *Acute Hazardous Waste* - those wastes listed in Table 4-1, Chart A.4 with a USEPA waste number with the designator "P" or those wastes with (H) following the waste number (FGS-ROK, Chapter 6, Definitions).

- *Combustible Liquid* - a liquid having a flashpoint at or above 100 °F (37.8 °C). Combustible liquids are categorized as Class II or Class III liquids and are further subdivided as follows (AFOSH STD 127-43, para 2f):
  1. Class II liquids are those having a flashpoint at or above 100 °F (37.8 °C) and below 140 °F (60 °C)
  2. Class IIIA liquids are those having flashpoints at or above 140 °F (60 °C) and below 200 °F (93.3 °C), except any mixture having components with flashpoints of 200 °F (93.3 °C)
  3. Class IIIB liquids are those having flashpoints at or above 200 °F (93.4 °C).

- *Disposal* - the utilization of those methods of treatment and/or containment technologies, as are approved in Chapter 6, Section 11, of FGS-ROK, 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-ROK, Chapter 6, Definitions).

- *Flammable Liquid* - a liquid with a flashpoint below 100 °F (37.8 °C) with a vapor pressure not exceeding 40 psia at 100 °F (37.8 °C). Flammable liquids are categorized as Class I liquids, and are further subdivided as follows (AFOSH STD 127-43, para 2i):
  1. Class IA are those that have a flashpoint below 73 °F (22.8 °C) and boiling point below 100 °F (37.8 °C).
  2. Class IB are those that have flashpoints below 73 °F (22.8 °C) and boiling points at or above 100 °F (37.8 °C).
  3. Class IC are those that have flashpoints at or above 73 °F (22.8 °C) and below 100 °F (37.8 °C).

- *Hazardous Constituent* - a chemical compound that is listed by name in Table 4-1 or possesses a characteristic described in Table 4-1 (FGS-ROK, Chapter 6, Definitions).

- *Hazardous Waste (HW)* - a discarded material that may be solid, semisolid, liquid, or contained gas and either exhibits a characteristic of a hazardous waste in Table 4-1, Section A-1 or is listed as a hazardous waste in Table 4-1, Chart A.4 (FGS-ROK, 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 206 L (55 gal) of hazardous waste or 1L (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-ROK, Chapter 6, Definitions).

- *Hazardous Waste Fuel* - hazardous wastes burned for energy recovery are termed "hazardous waste fuel." Fuel produced from hazardous waste by processing, blending, or other treatment is also hazardous waste fuel (FGS-ROK, Chapter 6, Definitions).

- *Hazardous Waste Generation* - any act or process that produces hazardous waste as defined in FGS-ROK (FGS-ROK, 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-ROK, Chapter 6, Definitions).

- *Hazardous Waste Storage Area* - a location on a U.S. Forces - Korea (USFK) installation where more than 206 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-ROK, 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-ROK, Chapter 6, Definitions).

- *Land Disposal* - placement in or on the land, including, but not limited to, land treatment, surface impoundments, underground injection wells, salt dome formations, salt bed formations, underground mines, or caves (FGS-ROK, Chapter 6, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Special Waste* - specific types of waste as defined in Table 4-1, Section A-3 (FGS-ROK, Chapter 6, Definitions).

- *Special Waste Disposal Facility* - a facility where special waste is landfilled, incinerated, destroyed, neutralized, or cement solidified. In particular, this refers to any one or a combination of the following intermediate and final disposal facilities (FGS-ROK, Chapter 6, Definitions):

    1. intermediate disposal facilities:
        a. an incineration facility
        b. a high temperature destruction facility

c. a shredding/cutting facility
d. a melting facility
e. a graduation facility
f. a refining facility (a facility that disposes of waste by screening, extracting, filtering, or distilling techniques, etc.)
g. a reaction facility (a facility that disposes of waste by such chemical reactions as neutralization, oxidation, etc.)
h. an oil/water separation facility
i. a coagulation/sedimentation facility
j. a dewatering facility
k. a drying facility
l. a solidification facility
m. a stabilization facility (including a composting facility)

2. final disposal facilities:
   a. an isolation type landfill
   b. a management type landfill
   c. a sedimentation type landfill
   d. a stabilization type landfill.

- *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-ROK, Chapter 6, Definitions).

- *Treatment, Storage, and Disposal Facility (TSDF)* - any facility not located on a USFK installation that is used for the collection, source separation, storage, transportation, transfer, processing, treatment, or disposal of hazardous waste (FGS-ROK, Chapter 6, Definitions).

- *Unique Identification Number* - a number assigned to generators of hazardous waste to identify the generator and used to assist in tracking the waste from point of generation to ultimate disposal. In USFK, the DOD Activity Address Code (DODAAC) will be used (FGS-ROK, 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 Table 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-ROK, Chapter 6, Definitions).

- *USFK Hazardous Waste Generator* - the installation or activity on an installation that produces a regulated hazardous waste (FGS-ROK, Chapter 6, Definitions).

HAZARDOUS WASTE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.4-1 through KO.4-11	(1)(2)(5)(6)(7)(8)(9)(10)(11)
Training	KO.4-12 and KO.4-13	(1)(2)(3)(4)(5)(6)(9)
Transportation of Hazardous Waste	KO.4-14 through KO.4-16	(7)(8)
Hazardous Waste Generators	KO.4-17 through KO.4-24	(2)(4)(5)(9)(10)
Hazardous Waste Accumulation Points	KO.4-25 through KO.4-30	(3)(9)
Hazardous Waste Storage Areas		
General	KO.4-31 through KO.4-43	(2)(5)
Containers	KO.4-44 through KO.4-47	(2)(5)
Documentation	KO.4-48 and KO.4-51	(1)(2)(3)(5)(9)
Hazardous Waste Disposal		
General	KO.4-52 through KO.4-56	(1)(2)(5)(7)(8)
Land Disposal	KO.4-57 through KO.4-63	(1)(2)(5)
Incinerators	KO.4-64 through KO.4-68	(1)(2)(5)
Other (Contractor-Operated) Treatment Facilities	KO.4-69 through KO.4-79	(1)(2)(5)
Treatment Technologies	KO.4-80 and KO.4-81	(1)(2)(5)
Specific Wastes	KO.4-82 and KO.4-83	(1)(2)(3)(5)(9)
Conventional Explosive Ordnance	KO.4-84 and KO.4-85	(1)(9)

(a) CONTACT/LOCATION CODE:

(1) BCE (Environmental Planning)
(2) DRMO (Defense Reutilization and Marketing Office)
(3) Accumulation Point Managers
(4) Fire Department
(5) TSDF (Treatment, Storage, and Disposal Facility) Officer
(6) Safety Manager
(7) Transportation Officer
(8) Base Supply
(9) Generating Activities
(10) BES (Bioenvironmental Engineering Services)
(11) Base Staff Judge Advocate

HAZARDOUS WASTE MANAGEMENT

Records To Review

- Generators (including TSDFs if they are also considered 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)

- TSDFs (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)

Physical Features To Inspect

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

People To Interview

- BCE (Environmental Planning)
- DRMO (Defense Reutilization and Marketing Office)
- Accumulation Point Managers
- Fire Department
- TSDF Officer
- Safety Manager
- Transportation Officer
- Base Supply
- Generating Activities
- BES (Bioenvironmental Engineering Office)
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ALL INSTALLATIONS	
KO.4-1. Determine actions or changes since the previous review of hazardous waste management (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.4-2. Installations must maintain copies of certain U.S. laws and applicable host nation hazardous waste laws (AF Hazardous Waste Management Policy Letter, 6 June 1991, para (IIa)).	Verify that the installation maintains copies of the following laws: (1)(11) - *Occupational Safety and Health Act* - *Hazardous Material Transportation Act* (HMTA) - *Resource Conservation and Recovery Act* and Hazardous and Solid Waste Amendments (RCRA/HSWA) - *Comprehensive Environmental Restoration, Compensation, and Liability Act* (CERCLA) and *Surperfund Amendment and Reauthorization Act* (SARA) - *Hazardous Materials Transportation Uniform Safety Act* - AFI 48-119, *Medical Service Environmental Quality Programs*, 25 July 1994. Verify that the installation maintains copies of applicable host nation hazardous waste laws.
KO.4-3. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AF Hazardous Waste Management Policy Letter, 6 June 1991 - AF Policy Letter, 21 January 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.4-4. Installations must meet regulatory and AF requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulations as a basis of finding).	Determine whether any new regulations concerning hazardous waste have been issued since the finalization of the manual. (1)(11) Verify that the installation is in compliance with newly issued regulations.

(1) BCE (Environmental Planning) (2) DRMO (Defense Reutilization and Marketing Office) (3) Accumulation Point Managers (4) Fire Department (5) TSDF (Treatment, Storage, and Disposal Facility) Officer (6) Safety Manager (7) Transportation Officer (8) Base Supply (9) Generating Activities (10) BES (Bioenvironmental Engineering Services) (11) Base Staff Judge Advocate

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-5. Installations that generate hazardous waste must have a Hazardous Waste Management Plan (AF Hazardous Waste Management Policy 6 June 1991, para III(b)).	Verify that the installation has a Hazardous Waste Management Plan that includes the following: (1)(6)(7) - letter of instruction - information and emergency contacts - introductory materials - introduction - responsibilities - organizational chart - location maps - waste inventory - waste analysis plan - recordkeeping - reporting - training - contingency plan preparedness and spill prevention - pollution prevention.
KO.4-6. Installations must develop a waste analysis plan (FGS-ROK, Chapter 6, Criterion 3c(3)(a)).	Verify that the installation, in conjunction with the HWSA manager, has developed a plan to determine how and when wastes are to be analyzed. (2)(5) Verify that the plan includes: - procedures for characterizing and verifying the testing of both onsite and offsite hazardous waste - testing parameters and the rationale for selecting them - frequency of analysis - test and sampling methods.
KO.4-7. The hazardous waste analysis plan must be updated every 3 yr (AFI 48-119, para 9.3.1).	Verify that BES updates the hazardous waste analysis plan at least every 3 yr. (10)
KO.4-8. Installations must recycle or reuse hazardous waste or special waste to the maximum extent practical (FGS-ROK, Chapter 6, Criterion 3k(6)).	Verify that hazardous waste and special waste is recycled or reused to the maximum extent practical. (1)(8)(9) 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.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-9. Hazardous waste and used oil must not be used for dust suppression or road treatment (FGS-ROK, Chapter 6, Criterion 3i(2)).	Verify that neither used oil, hazardous waste, nor used oil contaminated with any hazardous waste is used for dust suppression or road treatment. (1)(7)
KO.4-10. Installations must identify and characterize the wastes generated at their sites (FGS-ROK, Chapter 6, Criterion 3a(1); AF Hazardous Waste Management Policy, 6 June 1991, para III(c); AFI 48-119, para 9.3.1 and 9.3.4).	Determine whether the installation generates, transports, treats, stores, or disposes of any hazardous waste (see Table 4-1 for guidance). (1)(9) Verify that the installation identifies and characterizes its wastes. (NOTE: Used oil must also be characterized.) (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.) Verify that an HWPS is used to identify each hazardous waste stream. Verify that BES maintains copies of HWPSs after completing the health sections. Verify that the installation has a hazardous waste inventory that identifies all waste streams and a hazardous waste analysis plan that identifies and characterizes the hazardous waste streams.
KO.4-11. Generators must identify inherent hazardous characteristics associated with a waste (FGS-ROK, Chapter 6, Criterion 3a(2)).	Verify that wastes have been identified on the HWPS according to the inherent hazardous characteristics associated with the wastes in terms of: (9) - physical properties (solid, liquid, contained gases) - chemical properties (chemical constituents, technical or chemical name) - other descriptive properties (ignitable, corrosive, reactive, toxic). (NOTE: See Tables 4-2 and 4-3.) Verify that waste characterization is in accordance with: - USEPA test methods and protocols for hazardous waste determination - ROK Minstry of the Environment (MOE) standard test method for special wastes.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
TRAINING **KO.4-12.** Installation personnel who handle hazardous waste must meet specific training requirements (FGS-ROK, Chapter 6, Criteria 3c(9) and 3j(1) through 3j(4)).	Verify that all USFK personnel (including U.S. military, civilian, and local national personnel) whose duties involve actual or potential exposure to hazardous waste receive training. (1)(2)(3)(4)(5)(6)(9) (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 an HWAP or HWSA - those who collect hazardous waste samples - those who conduct other hazardous waste related activities as designated by the Base Commanders and/or Environmental Coordinators - those who are involved in the review/award/monitoring of a contract for hazardous wastes.) 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 final governing standards. 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.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.4-12. (continued)	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 cleanup)
	- 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 hazardous waste storage area operators:
	  - recordkeeping
	  - security
	  - inspections
	  - contingency plans
	  - storage requirements
	  - transportation requirements.
	
	Verify that training for new personnel assigned to duties involving actual or potential exposure to hazardous wastes is completed prior to their assuming those duties.
	
	Verify that such personnel work under direct supervision until training is completed.
	
	Verify that an annual review of initial training is provided.
	
	(NOTE: Hazardous Waste Operations and Emergency Response (HAZWOPER) training may fulfill the requirements of this checklist item, depending on the duties of the individual.)

KO.4-13. Installations must document all hazardous waste training for each individual assigned duties involving actual or potential exposure to hazardous waste (FGS-ROK, Chapter 6, Criterion 3j(5); Hazardous Waste Management Policy, 6 June 1991, para III(d)(2)).	Verify that all hazardous waste training is documented. (1)(2)(5)(6)(9) Verify that training records are up to date. Verify that training records are retained for 3 yr after termination of employment at the installation.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
TRANSPORTATION OF HAZARDOUS WASTE	
KO.4-14. Installations must prepare offsite hazardous or special waste shipments in accordance with applicable host nation and international transportation regulations (FGS-ROK, Chapter 6, Criterion 3a(4)(a)).	Verify that the installation prepares offsite hazardous waste shipments in accordance with applicable requirements in Sections 3 and 4 of this manual. (7) (NOTE: This requirement applies when transporting hazardous waste, via military vehicle or commercial transportation, on ROK public roads and highways.) (NOTE: Standards may include requirements for placarding, marking, containerization, and labeling among others.) Verify that hazardous waste designated for international transport is prepared in accordance with applicable international regulations. (NOTE: In the absence of applicable requirements in Sections 3 and 4 of this manual, international standards must be used.)
KO.4-15. All hazardous or special waste that leaves the installation must be accompanied by a manifest (FGS-ROK, Chapter 6, Criterion 3a(4)(b)).	Verify that all hazardous or special waste that leaves the installation is accompanied by a manifest. (7) Verify that DD Form 1348-1 is used. (NOTE: The manifest should include: - generator's name, address, 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.)
KO.4-16. Installations should ensure that transportation of hazardous wastes between buildings is accomplished so as to help prevent spills, releases, and accidents (MP).	Verify that procedures exist to manage movement of hazardous wastes throughout the installation. (7)(8) Verify that drivers are trained in spill control procedures. Verify that provisions are made to secure wastes in vehicles during transport.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
HAZARDOUS WASTE GENERATORS	
KO.4-17. Installations must conduct annual surveys of industrial processes and waste storage facilities (AFI 48-119, para 9.3.7).	Verify that BES conducts annual surveys of industrial processes and waste storage facilities to assess compliance with applicable worker and environmental protection requirements. (10)
KO.4-18. Generators must use a DODAAC number for all recordkeeping, reports, and manifests of hazardous or special wastes (FGS-ROK, Chapter 6, Criterion 3a(3)).	Verify that each generator uses a DODAAC number for all recordkeeping, reports, and manifests of hazardous or special wastes. (9)
KO.4-19. Generators must maintain an audit trail of hazardous waste from the point of generation to disposal (FGS-ROK, Chapter 6, Criterion 3a(4)(c)).	Verify that generators using Defense Reutilization and Marketing Services (DRMS) disposal services have a signed copy of the manifest from the initial DRMS recipient of the waste. (2)(9) Verify that, if a generator uses a hazardous or special waste management and/or disposal program of a USFK component with a different DODAAC number, it obtains a signed copy of the manifest from the receiving component. Verify that installations that dispose of their wastes outside of the DRMS system have developed their own manifest tracking system. Verify that, if an ROK contractor is used, the contractor completes all ROK manifest forms and returns the completed documents to the government contracting officer's representative (COR) and the corresponding certificates of disposal to the generator.
KO.4-20. Generators must reduce the amount of special waste produced as much as possible (FGS-ROK, Chapter 6, Criterion 3a(5)).	Verify that the generator reduces the amount of special waste produced as much as possible by means of technical improvement or recycling.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-21. Generators must meet specific collection and transportation standards for special wastes (FGS-ROK, Chapter 6, Criterion 3a(6)).	Verify that collection and transportation equipment does not emit offensive odors or allow special wastes to be blown off or dropped. Verify that particles of slag, waste asbestos, and waste agricultural chemicals are collected and transported in vinyl bags and are not blown off transportation equipment. Verify that, when a special waste is collected and transported in water and liquid form, a dedicated tank, container, or piping is used to avoid excessive agitation. (NOTE: A dedicated tank, container, or piping is used for collecting and transporting special waste so as to minimize the risk of mixing incompatible chemicals by shaking while they are being collected or transported.) (NOTE: A special waste in liquid form has a water content than 85 percent or a solid material content less than 15 percent.) Verify that incompatible special wastes are collected and transported by the type of noncompatible special waste. (NOTE: This requirement means that incompatible special wastes must be collected and transported separately.) Verify that special waste collection and transportation vehicles bear the appropriate identification listed in Table 4-4. (NOTE: Such labels are issued by the Regional Administrators of Environmental Administration.)
KO.4-22. Special waste containers must be properly labeled (FGS-ROK, Chapter 6, Criterion 3a(6)(e)).	Verify that containers of special waste bear the name and business telephone number of the generator. Verify that the information is marked with black characters on both sides of the special waste container and is at least 100 cm [≈39 in.] wide by at least 50 cm [≈19 in.] in length.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:

KO.4-23. Installations that generate hazardous wastes and use the DRMO for disposal of hazardous waste must follow established procedures (AFI 48-119, para 9.3.6; AF Hazardous Waste Management Policy, 6 June 1991, para III(e)(2) and Appendix C, Section B).	Verify that: (2)(9)
	
	- generators provide an HWPS along with the waste
	- generators hand-carry AF Form 2005 to Base Supply to initiate timely action
	- generators hand-carry DD Form 1348-1 when received from Base Supply, to BCE for certification
	- generators hand-carry certified DD Form 1348-1 from BCE to the DRMO.
	
	(NOTE: HQ USAF/CEV 25 September Memorandum, *Hazardous Waste Disposal*, allows installations to use alternate procedures in which the installation hazardous waste managers prepare and certify the DD Form 1348-1 instead of Base Supply. The Hazardous Waste Management Plan needs to indicate what procedure is used. In the approved alternate procedure no AF Form 2005 is prepared, and the hazardous waste managers also maintain records of all transactions.)
	
	Verify, by examining records and interviewing the staff at Base Supply (Customer Service Unit), that:
	
	- computer records of all hazardous waste transfer actions are maintained
	- a DD Form 1348-1 is processed for each transaction and includes:
	  - the hazardous waste stock number
	  - waste quantity
	  - applicable disposal cost and funding information.
	
	Verify, by examining records and interviewing BCE personnel, that:
	
	- a letter identifying personnel eligible to certify hazardous waste disposal turn-in documents (DD Form 1348-1) is current and on file at the servicing DRMO
	- all DD Forms 1348-1 are properly certified, indicating that hazardous waste is properly identified (USEPA identification number), labeled, and packaged
	- DD Form 448, Military Interdepartmental Purchase Request (MIPR), has been executed with DRMO, and the Accounting and Finance Office (AFO) maintains DD Form 448 after execution
	- billings from DRMO are on a standard form (SF) 1080 and are reviewed and certified for payment by BCE through the AFO.
	
	Verify, by examining records and interviewing BES personnel, that:
	
	- BES conducts a semiannual review of the health hazard listing to review all issue exception code (IEX) 8 and 9 items and determines whether health hazard items produce a specific hazardous waste
	- nomenclatures are included in the health hazard listing
	- BES reviews all plans to build or modify facilities used to treat, store, or dispose of hazardous waste.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-24. Installations with HWSAs should provide specific information to certain agencies (MP).	Verify that police, fire departments, and emergency response teams are familiar with the layout of the facility, properties of the waste being handled, and general operations. (4)(5) Verify that the hospital is familiar with the site and the types of injuries that could result in an emergency.
HAZARDOUS WASTE ACCUMULATION POINTS	
KO.4-25. HWAPs must meet specific design and operating standards (FGS-ROK, Chapter 6, Criteria 3b(1) and 3b(2)).	Verify that an HWAP is at or near the point of generation and that no more than 206 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste (see Table 4-1) from each waste stream is accumulated there. (3) Verify that, when the above 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. Verify that, after leaving the HWAP, the waste either goes to an on-site HWSA or to an offsite treatment and disposal facility. Verify that each HWAP is designed and operated to provide appropriate segregation for different waste streams, including those that are chemically incompatible. (NOTE: See Table 4-5 for a list of incompatible wastes.) Verify that each HWAP has warning signs appropriate to the waste being accumulated at the site.
KO.4-26. Containers at HWAPs must meet specific requirements (FGS-ROK, Chapter 6, Criteria 3b(3) and 3d(1)(a) through 3d(1)(d)).	Verify that containers are in good condition and free from severe rusting, bulging, or structural defects. (3) Verify that containers, including overpack containers, are compatible with the materials stored. Verify that containers are kept closed, except when they need to be opened to add or remove waste. Verify that containers are not opened, handled, or stored in a manner that could cause a rupture or a leak. Verify that containers are marked with a hazardous waste marking and a label indicating the hazard class of the contents (flammable, corrosive, etc.).

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-27. HWAP container storage areas must have containment systems (FGS-ROK, Chapter 6, Criterion 3b(3)).	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. (3) (NOTE: This applies only to containers that hold free liquids.)
KO.4-28. HWAPs must be inspected weekly for leaking containers and deterioration of the containment system caused by corrosion and other factors (FGS-ROK, Chapter 6, Criteria 3b(3) and 3d(1)(e)).	Verify that a weekly inspection is performed for leaking containers and for deterioration of containers and the containment system. (3)(9) Verify that secondary containment systems are inspected for defects and emptied of accumulated releases.
KO.4-29. HWAPs that have containers holding ignitable or reactive waste must be located at least 15 m (50 ft) inside the installation boundary (FGS-ROK, Chapter 6, Criteria 3b(3) and 3d(3)).	Verify that containers which hold ignitable or reactive waste are at least 15 m (50 ft) inside the installation boundary. (3)(9)
KO.4-30. HWAPs must handle incompatible wastes according to specific requirements (FGS-ROK, Chapter 6, Criteria 3b(3) and 3d(4)).	Verify that incompatible wastes and materials are not placed in the same container. (3)(9) Verify that hazardous waste is not placed in an unwashed container that previously held an incompatible waste or material. 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.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
HAZARDOUS WASTE STORAGE AREAS **General**	
KO.4-31. New HWSAs must be located so as to minimize the risk of a release due to seismic activity, floods, or other natural events (FGS-ROK, Chapter 6, Criterion 3c(1)).	Verify that new HWSAs are (to the maximum extent possible) located so as to minimize the risks from natural disasters. (5) Verify that, for storage areas located where such risks may be encountered, the installation spill prevention and control plan addresses the risk.
KO.4-32. Existing HWSAs must be listed with the USFK Environmental Programs Office (EPO) (FGS-ROK, Chapter 6, Criterion 3c(1)).	Verify that existing HWSAs are identified to the USFK EPO on a listing that includes site maps and information on the types and quantities of HW generated and stored. (5)
KO.4-33. HWSAs must meet specific security requirements (FGS-ROK, Chapter 6, Criterion 3c(4)).	Verify that the installation prevents the unknowing entry, and minimizes the possibility of unauthorized entry, of people or livestock onto HWSA grounds. (5) Verify that the HWSA security system consists of either: - a 24-h surveillance system (e.g., television monitors, surveillance by guards) 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). Verify that a sign is posted with the words DANGER UNAUTHORIZED PERSONNEL KEEP OUT at each entrance and at other locations in sufficient numbers to be seen from any approach to the HWSA. Verify that the legend is written in English and any other language predominant in the area surrounding the installation. Verify that signs are legible from 25 ft [7.5 m]. (NOTE: Existing signs with a legend other than the above may be used if the legend indicates that only authorized personnel are allowed to enter, and that entry can be dangerous.)

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-34. HWSAs must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste (FGS-ROK, Chapter 6, Criteria 3c(2), 3c(5), and 3c(7)).	Verify that the following equipment is easily accessible to personnel in HWSAs and in working condition: (5) - internal communications or alarm system capable of providing immediate emergency instructions to facility personnel - telephone (immediately available at the scene of operations) or hand-held two-way radio - portable fire extinguishers and special extinguishing equipment (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 - personal protective equipment appropriate to the materials stored - eyewash and shower facilities. Verify that the equipment is tested and maintained as necessary to insure proper operation in an emergency. 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. Verify that no containers obstruct exits.
KO.4-35. Installations must meet specific requirements with regard to access to communications or alarm systems in HWSAs (FGS-ROK, Chapter 6, Criterion 3c(6)).	Verify that, whenever hazardous waste is being poured, mixed, or otherwise handled, all personnel involved in the operation have immediate access to an internal alarm or emergency communications device, either directly or through visual or voice contact with another person. (5) Verify that, if there is only one person on duty in the HWSA, said person has immediate access to a device, such as a telephone (immediately available at the scene of operation) or a hand-held, two-way radio capable of summoning emergency assistance.
KO.4-36. The storage of ignitable, reactive, or incompatible wastes at HWSAs must not threaten human health or the environment (FGS-ROK, Chapter 6, Criterion 3c(10)).	Verify that the storage of ignitable, reactive, or incompatible wastes is accomplished so as to prevent threats to human health or the environment. (2)(5) Verify that the HWSA manager takes precautions to prevent accidental ignition or reaction of ignitable or reactive wastes. Verify that ignitable and reactive waste are separated and protected from sources of ignition or reaction.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-36. (continued)	(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.) Verify that while ignitable or reactive waste is being handled, smoking and open flames are confined to specially designated areas. Verify that NO SMOKING signs are conspicuously placed wherever there is a hazard from ignitable or reactive waste. Verify that, in areas where access by non-English speaking persons is expected, the NO SMOKING legend is written in English and in any other language predominant in the area. Verify that water reactive waste is not stored in the same area as flammable and combustible liquids.
KO.4-37. HWSAs must handle incompatible wastes in accordance with specific requirements (FGS-ROK, Chapter 6, Criterion 3d(4)).	Verify that incompatible wastes and materials are not placed in the same container. (2)(5) Verify that hazardous waste is not placed in an unwashed container that previously held an incompatible waste or material. 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.
KO.4-38. Certain precautions with regard to handling ignitable, reactive, or incompatible wastes should be taken in HWSAs (MP).	Verify that, when treating, storing, or disposing of ignitable or reactive wastes, or when mixing incompatible wastes and other materials, precautions are taken to prevent dangerous reactions, including: - generation of extreme heat or pressure, fires or explosions, or violent reactions - production of uncontrolled toxic mists, fumes, dusts, or gases sufficient to threaten human health or the environment - production of uncontrolled flammable fumes or gases sufficient to pose a risk of fire or explosions - damage to the structural integrity of the device or facility.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-39. Installations must maintain an HWPS for each waste stream handled by each HWSA (FGS-ROK, Chapter 6, Criterion 3c(3)(b)).	Verify that the installation maintains a file of HWPSs. (2)(5) Verify that the HWSA accepts no waste for storage unless it has received an HWPS. 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.
KO.4-40. HWSA managers must conduct periodic verification testing of the hazardous waste in storage (FGS-ROK, Chapter 6, Criterion 3c(3)(b)).	Verify that periodic testing is carried out to ensure that the generator has accurately identified the stored hazardous wastes. (2)(5)
KO.4-41. Prior to accepting waste from a generator, the HWSA manager must follow specific procedures (FGS-ROK, Chapter 6, Criterion 3c(3)(c)).	Verify that, prior to accepting waste from generators, the HWSA manager: (2)(5) - 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.
KO.4-42. Installations must inspect HWSAs for malfunction, deterioration, operator errors, and discharges (FGS-ROK, Chapter 6, Criterion 3c(8)).	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. (2)(5) 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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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-42. (continued)	(NOTE: The FGS has established inspection frequency for the following equipment/ facilities: - containers at HWAPs and HWSAs - container storage areas - tank systems. The frequency at which other equipment/facilities 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 of malfunction or any operator error goes undetected between inspections.) 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. Verify that, when an imminent hazard is identified or one has already occurred, the installation takes immediate action. Verify that inspections are recorded in an inspection log or summary that is kept for at least 3 yr from the date of inspection and includes at least: - 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.
KO.4-43. At the closure of an HWSA, all hazardous waste and hazardous waste residues must be removed (FGS-ROK, Chapter 6, Criterion 3g).	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. (2)(5) Verify that the closure is done in a manner which eliminates or minimizes the need for future maintenance or the potential for future releases of hazardous waste. Verify that the HWSA is closed in accordance with the Closure Plan.
Containers	
KO.4-44. Containers at HWSAs must meet specific standards (FGS-ROK, Chapter 6, Criterion 3d(2)).	Verify that containers are in good condition, and free from severe rusting, bulging, or structural defects. (2)(5) Verify that containers, including overpack containers, are compatible with the materials stored. Verify that containers are kept closed, except when they need to be opened to add or remove waste.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-44. (continued)	Verify that containers are not opened, handled, or stored in a manner that could cause a rupture or a leak. Verify that containers are marked with a hazardous waste marking and a label indicating the hazard class of the contents (flammable, corrosive, etc.).
KO.4-45. HWSA container storage areas must have a containment system (FGS-ROK, Chapter 6, Criterion 3d(2)).	Verify that the container storage area has a containment system that has sufficient capacity to contain 10 percent of the volume of the containers or the volume of the largest container, whichever is greater. (2)(5) Verify that the HWSA is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed. (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.)
KO.4-46. HWSAs must be inspected weekly for leaking containers and for deterioration of containers and the containment system caused by corrosion and other factors (FGS-ROK, Chapter 6, Criterion 3d(1)(e)).	Verify that a weekly inspection is performed. (2)(5) Verify that secondary containment systems are inspected for defects and emptied of accumulated releases.
KO.4-47. HWSAs that have containers holding ignitable or reactive waste must be located at least 15 m (50 ft) inside the installation boundary (FGS-ROK, Chapter 6, Criterion 3d(3)).	Verify that containers which hold ignitable or reactive waste are at least 15 m (50 ft) from the installation boundary. (2)(5)

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
DOCUMENTATION	
KO.4-48. HWSAs and HWAPs must maintain a hazardous waste log, inspection logs, manifests, and waste analysis/ characterization records (FGS-ROK, Chapter 6, Criteria 3e(1) through 3e(5)).	Verify that the installation maintains a written hazardous waste log that includes the following: (2)(3)(5)(9) - name and address 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. 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. Verify that the installation maintains inspection logs for 3 yr. Verify that the installation retains manifests of incoming and outgoing hazardous wastes for 3 yr. Verify that the installation retains waste analysis/characterization records for a minimum period of 3 yr after closure.
KO.4-49. Installations must report to USFK EPO annually by the end of January on how much hazardous and special waste they generated during the previous year (FGS-ROK, Chapter 6, Criterion 3e(7)).	Verify that the installation reports to USFK EPO annually by the end of January on how much hazardous and special waste they generated during the previous year. (1)
KO.4-50. HWSAs must have a written closure plan (FGS-ROK, Chapter 6, Criterion 3e(6)).	Verify that the HWSA has a closure plan that includes: (2)(5) - 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. Verify that the installation develops a closure plan prior to opening a new HWSA.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-51. Installations must have a contingency plan to manage spills and releases of hazardous waste (FGS-ROK, Chapter 6, Criterion 3f).	Verify that the installation has a contingency plan to manage spills and releases of hazardous waste. (2)(5) Verify that a copy of the contingency plan is maintained at the HWSA and each HWAP. 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. Verify that the plan is available in both English and Korean.
HAZARDOUS WASTE DISPOSAL **General**	
KO.4-52. Installations that transship hazardous wastes to a country other than the United States must meet specific requirements (FGS-ROK, Chapter 6, Criterion 3k(2)).	Determine whether the installation transships hazardous wastes to a country other than the United States. (7) Verify that the transshipment meets applicable international agreements. Verify that methods of disposal meet the requirements of the final governing standards for the nation in which the waste is disposed, if any such standards exist. Verify that. if final governing standards cannot be met, the waste is either retrograded to the US or transferred to another country where applicable final governing standards allow for disposal. Verify that the transshipment has been approved by the USFK Assistant Chief of Staff in conjunction with the Executive Agent of the receiving nation. (NOTE: The determination of whether particular USFK-generated hazardous waste may be disposed of in the Republic of Korea is made by the USFK EPO, in coordination with the Director of Defense Logistics Agency (DLA), or other relevant USFK components, and the Chief of the U.S. Diplomatic Mission.)

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-53. USFK hazardous or special waste must normally be disposed of through the DRMS (FGS-ROK, Chapter 6, Criterion 3k(1); AF Hazardous Waste Management Policy 6 June 1991, para III(f)).	Verify that the installation normally disposes of its USFK hazardous or special waste through the DRMS. (1)(5) Verify that, if the installation does not use the DRMS for disposal, the Staff Judge Advocate and the Base Civil Engineer review the contract prior to its submission to the Base Contracts Office (BCO) to ensure that ROK laws are followed. (NOTE: Installations use contractors to dispose of several types of special wastes such as asbestos and oil-contaminated waste. The requirement to use DRMS does not prohibit that practice. See checklist item KO.4-54.) (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 to ensure that installation contracts and disposal criteria are at least as protective as the criteria used by the DRMS.)
KO.4-54. USFK hazardous or special waste generators that use contractors for disposal must monitor their contractors for compliance with specific criteria (FGS-ROK, Chapter 6, Criterion 3k(3)(c) and 3k(5)).	Verify that hazardous or special waste is entrusted to a special waste disposal contractor or recycler authorized by the Regional Administrator of Environmental Administration or a public special waste disposal facility of the Environmental Management Corporation. Verify that the IC and contracting officers ensure that contractors: - avoid the blowing or dropping of special waste and prevent offensive odors - use 150 kg/m^3 or more of cement and less than 20 percent water content after solidification where special waste is solidified with cement - achieve a reduction in volume of waste no less than 15 percent of the original volume, when special waste is disposed by incineration - achieve a reduction in volume of waste to less than 5 percent of the original volume, when special waste is disposed by high temperature destruction - meet air and water treatment standards for disposal of hazardous waste (See Section 1, *Air Emissions Management* and Section 13, *Water Quality Management*) - have valid ROK permits. (NOTE: The MOE may additionally specify stricter air and water treatment standards considering the geographic situation and characteristics of the ecosystem.)

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-55. Hazardous material that meets the definition of hazardous waste must be disposed of as a hazardous waste in certain circumstances (FGS-ROK, Chapter 6, Criterion 3k(4)).	Determine whether the installation has any hazardous materials that meet the definition of hazardous waste. (1)(2)(5)(8) Verify that the installation disposes of such materials as hazardous wastes whenever: - the installation is discarding the materials as being no longer useful - the materials have failed the DRMS reutilization, transfer, or sales cycles.
KO.4-56. A USFK special waste disposal facility (such as a land farm) that is operated by a contractor must have a technical manager (FGS-ROK, Chapter 6, Criterion 3k(11)(a)).	Determine whether the installation has a special waste disposal facility that is operated by a contractor. (1) (NOTE: USFK EPO provided the interpretation of the applicability of the FGS-ROK requirement for a technical manager.) Verify that the special waste disposal facility is operated by a technical manager who is a Grade I engineer in one or more of the following areas: - waste disposal - air environmental - water environmental - civil - mechanical - chemical. Verify that the installation has a program in place to ensure that its waste disposal contractors monitor their facilities periodically for compliance with the requirements in Table 4-6.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Land Disposal	(NOTE: The requirements of this section apply to landfill contractors. It is the responsibility of the installation to ensure that the contractor's facilities satisfy these requirements.)

KO.4-57. Land disposal facilities for hazardous waste must meet specific criteria (FGS-ROK, Chapter 6, Criterion 3k(7)).	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. (1)(2)(5)
	
	Verify that the land disposal system is off installation and has:
	
	- a liner of natural or manmade materials that:
	  - restricts the downward or lateral escape of hazardous wastes, hazardous constituents, or leachate
	  - has a permeability no greater than 10^{-7} cm/s [3.94 x 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.

KO.4-58. Landfills used to dispose of special wastes must meet general design standards (FGS-ROK, Chapter 6, Criterion 3k(8)(a)).	Verify that the landfill: (1)(2)(5) - is cordoned with a 1.5 m [≈5 ft] or higher wire fence, unless the site is naturally isolated or in a secure area - has a retaining wall or banks constructed to withstand and retain safely the loading of special waste - has a weighing facility that can measure the weight of incoming special waste - has a foundation that is structured without settlement - uses equipment that prevents rain from flowing into the landfill area - uses equipment that separates and compacts waste - has a vehicle-wheel wash facility for transportation vehicles - has four or more groundwater monitoring wells constructed around the landfill area to determine whether underground water is polluted. Verify that the landfill has a sign (larger than 100 cm x 50 cm [≈39 in. x ≈19 in.]) that reads "Special Waste Landfill Area" posted at the entrance to the landfill. Verify that the sign includes the name address, and telephone number of the landfill manager.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-59. Isolation type landfills must meet additional requirements (FGS-ROK, Chapter 6, Criterion 3k(8)(b)).	Verify that the isolation type landfill has: (1)(2)(5) - a possible landfilling area of 50 m^2 [≈538 ft^2] or more, or a possible capacity of 250 m^3 [≈8830 ft^3] or more - a floor and outer walls that are waterproof and constructed with 15 cm [≈6 in.] or more of reinforced concrete with a compaction strength of 210 kg/m^2 [≈463 lb/ft^2] or more as measured by the Korean Industrial Standard F-2405, or a structure with an equal effect of separation - concrete partition walls provided at least every 50 m^2 [≈538 ft^2] or 250 m^3 [≈8830 ft^3] of landfilling capacity - a concrete inner partition wall that is at least 10 cm [≈4 in.] thick and has 210 kg/cm^2 [≈463 $lb/in.^2$] or more of strength.

KO.4-60. Management type landfills must meet additional requirements (FGS-ROK, Chapter 6, Criterion 3k(8)(b)).	Verify that the management type landfill has: (1)(2)(5)
	- a possible landfilling area of 1000 m^2 [≈10,764 ft^2] or more, or a possible capacity of 3000 m^3 [≈105,944 ft^3] or more
	- watertight treatment to prevent leachate consisting of one of the following:
	  - 2 or more ply high density polyethylene or synthetic resins of materials corresponding to high density polyethylene with 1 mm or more of thickness, affording a protection gap of nonwoven fabric between liners and at least 30 cm [≈12 in.] of clay added to the top and bottom of watertight materials
	(NOTE: For a facility that landfills animal carcasses, sludge from wastewater treatment plants, manufacturing process sludge, waste plaster, or waste asbestos only, 1 or more ply high density polyethylene is sufficient.)
	  - clay, bentonite, etc. with a water permeability coefficient less than 10^{-7} cm/s [3.94 x 10^{-8} in./s] with 1.5 m or more of thickness
	(NOTE: For a facility that landfills animal carcasses, sludge from wastewater treatment plants, manufacturing process sludge, waste plaster, or waste asbestos only, a liner of 75 cm [≈30 in.] thickness is sufficient.)
	(NOTE: When the water permeability of natural soil is less than 10^{-7} cm/s [3.94 x 10^{-8} in./s], special watertight treatment is not required.)
	- a catch basin that collects leachate at the bottom of the landfill facility
	- equipment to transport collected leachate to treatment facilities
	- leachate storage and treatment tanks with at least seven times the capacity of the most frequent daily rainfall having 10 mm/day of rainfall during the last 10 yr
	- a facility that collects and disposes of gas emitted from the landfill for facilities that landfill organic special waste.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-61. Sedimentation type landfills must meet additional requirements (FGS-ROK, Chapter 6, Criterion 3k(8)(b)).	Verify that the sedimentation type landfill has: (1)(2)(5) - a possible sedimentation area of 1000 m^2 [≈10,764 ft^2] or more or 3000 m^3 [≈105,944 m^3] or more in capacity - equipment to dispose of leachate discharged from the landfill - a catch basin that collects leachate at the bottom of the landfill facility - equipment to transport collected leachate to treatment facilities - watertight treatment to prevent leachate consisting of one of the following: - 2 or more ply high density polyethylene or synthetic resins of materials corresponding to high density polyethylene with 1 mm or more of thickness, affording a protection gap of nonwoven fabric between liners and at least 30 cm [≈12 in.] of clay added to the top and bottom of watertight materials (NOTE: For a facility that landfills animal carcasses, sludge from wastewater treatment plants, manufacturing process sludge, waste plaster, or waste asbestos only, 1 or more ply high density polyethylene is sufficient.) - clay, bentonite, etc. with a water permeability coefficient less than 10^{-7} cm/s [3.94 x 10^{-8} in./s] with 1.5 m [≈5 ft] or more of thickness. (NOTE: For a facility that landfills animal carcasses, sludge from wastewater treatment plants, manufacturing process sludge, waste plaster, or waste asbestos only, a liner of 75 cm [≈30 in.] thickness is sufficient.) (NOTE: When the water permeability of natural soil is less than 10^{-7} cm/s [3.94 x 10^{-8} in./s], special watertight treatment is not required.)
KO.4-62. Stabilization type landfills must meet additional standards (FGS-ROK, Chapter 6, Criterion 3k(8)(b)).	Verify that the stabilization type landfill has: (1)(2)(5) - a possible landfilling area of 1000 m^2 [≈10,764 ft^2] or more or 3000 m^3 [≈105,944 ft^3] or more in capacity - an embankment constructed to retain special waste safely.
KO.4-63. The Base Environmental Manager must provide the information required on the HWPS concerning land disposal restrictions (AF Hazardous Waste Management Policy, 6 June 1991, Appendix C, Section B, para 2(c)(1)(c)).	Verify that the following information is provided on the HWPS: (1)(2)(5) - treatability groups - USEPA hazardous waste codes - all subcategories if there is more than one code - the five letter treatment code or the section of the CFR where the treatment appears - whether or not a lab pack contains a waste identified as a restricted waste.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Incinerators	(NOTE: The requirements of this section apply to incinerators operated by contractors. It is the responsibility of the installation to ensure that the contractor's facilities satisfy these requirements.) (NOTE: The requirements of this section apply to incinerators that incinerate hazardous or special waste as well as to boilers and industrial furnaces that burn hazardous or special waste for any recycling purposes.) (NOTE: Specific requirements for incineration of polychlorinated biphenyl (PCB)-containing wastes are set forth in Section 11, *Toxic Substances Management*.)
KO.4-64. Incinerators used to dispose of hazardous or special waste must be licensed or permitted to accept the type of waste being burned (FGS-ROK, Chapter 6, Criterion 3k(9)(a)).	Verify that incinerators used to dispose of hazardous or special waste are licensed or permitted by a competent ROK authority or approved by the USFK EPO. (1)(2)(5)
KO.4-65. Incinerators for hazardous or special waste must meet specific standards as a prerequisite for licensing/permitting or approval (FGS-ROK, Chapter 6, Criterion 3k(9)(b)).	Verify that incinerators are designed to include appropriate equipment to effectively destroy hazardous constituents and control harmful emissions. (1)(2)(5) Verify that incinerators are operated according to management practices (including proper combustion temperature, waste feed rate, combustion gas velocity, and other relevant criteria) so as to effectively destroy hazardous constituents and control harmful emissions.

KO.4-66. Hazardous and special waste incinerators must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(9)(b)).	Verify that incinerators achieve either of the following operating standards: (1)(2)(5)
	
	- the incinerator must:
	  - 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 carbon monoxide in stack exhaust gas
	  - minimize emission or 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 which represent the greatest degree of difficulty of incineration in each waste of mixture of waste to be burned.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-66. (continued)	(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 ROK authority or the USFK EPO to conclude that the incinerator will effectively destroy the principal organic hazardous constituents of each waste to be burned.)

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-67. Thermal destruction facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(9)(c)).	Verify that the incineration facility: (1)(2)(5) - has an incineration capacity of 25 kg/h [≈55 lb/h] or more - has an off-gas temperature of 700 °C [1300 °F] or higher - uses a combustion chamber that maintains gas retention time for 0.5 s or longer, and mixes enough gas in the incineration chamber - has the inside of the combustion chamber constructed with high temperature resistant fire blocks with 32 °C [90 °F] or more (34 °C [94 °F] or more for dry distillation) of durable refractoriness (SK), or fire-resistant materials - maintains a temperature outside the combustion chamber of less than 80 °C [176 °F] - when the combustion chamber is covered with iron, uses heat resistant painting or insulation material at the part of the combustion chamber exposed to high temperature - uses a waste entrance to the incineration chamber that withstands high temperature and prevents outside air or incinerated gas from flowing in or out - has an extra burner with enough capacity to control temperature in the combustion chamber - uses equipment that controls the amount of air supply into the combustion chamber - has a cooling facility or heat recollecting facility that enables incinerated gas to cool down by less than 300 °C [572 °F] - uses a ventilation facility that maintains a fixed pressure in the incineration chamber - uses an air pollution control device that meets applicable emission standards - has two or more water pumps for continuous water supply if the facility for cooling combustion gas or collecting waste heat is a water pipe system - uses a funnel with appropriate height and structure considering ventilation and air dispersion of generating gas - has safety facilities to provide against explosion accidents, etc. - has a viewing window to view inside the combustion chamber - has a cleaning hole structured to prevent inflow of outside air and outflow of combustion gas - prevents the scattering of ashes while removing incineration residuals - uses a rotary incineration chamber that controls the retention time of waste in the combustion chamber by changing the rotation speed of the chamber - uses a thermocouple that measures 1200 °C [2200 °F] or higher, a thermometer, and an automatic temperature recorder that continuously records temperature changes and is located in the combustion chamber and its exit - uses a pressure gauge on the top of the combustion chamber that measures the pressure inside the chamber.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-68. High temperature destruction facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(9)(c)).	Verify that the high temperature destruction facility: (1)(2)(5) - has an destruction capacity of 25 kg/h [≈55 lb/h] or more - has an off-gas temperature of 1100 °C [2020 °F] or higher - uses a combustion chamber that maintains gas retention time for 2 s or longer, and mixes enough gas in the destruction chamber - has the inside of the combustion chamber constructed with high temperature and fire resistant materials - uses a thermocouple that measures 1600 °C [2920 °F] or higher, a thermometer, and an automatic temperature recorder that continuously records temperature changes and is located in the destruction chamber and its exit - complies with applicable construction standards for incineration facilities (see checklist item KO.4-68).
Other (Contractor-Operated) Treatment Facilities	(NOTE: the requirements of this section apply to treatment facilities operated by contractors. It is the responsibility of the installation to ensure that the contractor's facilities satisfy these requirements.)
KO.4-69. Shredding/cutting facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the shredding/cutting facility: (1)(2)(5) - has a shredding/cutting capacity of 25 kg/h [≈55 lb/h] or more - is able to shred or cut 15 cm [≈6 in.] or less pieces - is able to control the size of outcome products - prevents scattering of dust or slag - is equipped with loading and unloading, shredding and cutting facilities - operates within the disposal capacity of the facility.
KO.4-70. Melting facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the melting facility: (1)(2)(5) - has a disposal capacity of 25 kg/h[≈55 lb/h] or more - has heating equipment to maintain sufficient melting heat and a device to control temperature - disposes of noxious gas generated by the melting process - uses a thermometer to check melting temperature - maintains proper melting temperature according to types of special waste.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-71. Graduation facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the graduation facility: (1)(2)(5) - has a disposal capacity of 125 kg/h [≈275 lb/h] or more - is made of materials that are not eroded or damaged by special waste - has a device to control temperature and a thermometer, if the facility uses combustion gas - has an additional safety valve, if the facility uses vacuum evaporation - controls the volume of graduation - disposes of noxious gas generated by the graduation process - prevents inflow of outside air or gas leakage from the facility - controls the temperature and pressure appropriately for smooth graduation of special waste by types - regularly removes residues from the graduation process.
KO.4-72. Refining facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the refining facility: (1)(2)(5) - has an inside measurement of 0.1 m^3 [≈3.53 ft^3] or more - disposes of toxic gas generated during the refining process - controls the volume of waste deposit - controls the amount of chemical deposit, temperature, pressure, agitation, etc. for proper refining or reaction - has the reaction chamber regularly cleaned to prevent erosion and to maintain normal function.
KO.4-73. Reaction facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the reaction facility: (1)(2)(5) - has an inside measurement of 0.1 m^3 or more - has a reactor and equipment for waste supply control, agitation, and chemical deposit - uses a reactor made of materials that are not eroded or damaged by special waste - disposes of toxic gas generated during the reaction process.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-74. Oil and water separation facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the oil and water separation facility: (1)(2)(5) - has a separation capacity of 125 kg/h [≈275 lb/h] or more - prevents the outflow of waste oil and the counter-flowing of separated water - uses a storage tank for recovered oil with a capacity of 3 m^3 [≈106 ft^3] or more that is made of materials that are not eroded or damaged and that prevents leaks of waste oil - eliminates extraneous substances by means of a screen on inlets - controls the amount of waste oil deposit - immediately conveys separated oil to an oil recollection storage tank - prevents the backflow of separated oil - uses a regularly rinsed filter that is replaced when necessary - is inspected for performance annually by each area environment office, based on guidelines developed by USFK EPO.
KO.4-75. Coagulation/ sedimentation facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the coagulation/sedimentation facility: (1)(2)(5) - has an inside measurement of 0.5 m^3 [≈18 ft^3] or more - has a coagulation/sedimentation tank with a capacity to keep wastes for appropriate staying lengths - has a condensation/sedimentation tank and equipment for agitation and chemical deposit - uses an agitator with rotation speed control - has a device to discharge coagulated and sedimented sludge - has a cover to prevent the inflow of rain if the facility is constructed outdoors.
KO.4-76. Dewatering facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the dewatering facility: (1)(2)(5) - has an inside measurement of 0.2 m^3 [≈7 ft^3] or more and a power of at least 0.1 hp - has the capacity to reduce water content to 80 percent or less - pumps wastewater generated from the dewatering process into the wastewater disposal facility - controls dewatering volume - prevents liquid waste or wastewater generated by the dewatering process from accidental discharge - uses a regularly cleaned filter or dewatering media that is replaced when necessary - removes foreign materials to prevent damages.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-77. Drying facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the drying facility: (1)(2)(5) - has an inside volume of 1 m^3 [≈35 ft^3] or more and uses more than 30 kg/h [≈67 lb/h] of fuel for converting waste to solid form - has equipment to control drying temperature for vacuum or dry heating systems - has a cover to prevent rain inflow for a natural drying system - disposes of toxic gas generated by the drying process - dries special wastes according to type and maintains proper drying temperature.
KO.4-78. Solidification facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the solidification facility: (1)(2)(5) - has a disposal capacity of 25 kg/h [≈55 lb/h] or more - has equipment to mix cement, water, and chemicals that reduce leaching evenly and to control the mixture ratio - uses equipment to cure the mixed substance - prevents rain runoff - is cleaned after each operation to remove residues in the mixer - provides for well cured cement.
KO.4-79. Stabilization facilities must meet specific operating standards (FGS-ROK, Chapter 6, Criterion 3k(10)(f)).	Verify that the stabilization facility: (1)(2)(5) - has a disposal capacity of 25 kg/h [≈55 lb/h] or more, or an inside measurement of 2 m^3 [≈71 ft^3] or more - converts special waste to a chemically and biologically stable condition by using chemical substances or organisms - disposes of toxic gas generated by the stabilizing process.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

Treatment Technologies
 	
KO.4-80. Hazardous or special wastes that are disposed of as solid wastes must be treated prior to disposal so that they no longer exhibit hazardous characteristics (FGS-ROK, Chapter 6, Criteria 3k(10)(a) through 3k(10)(d)).
	Determine whether wastes that are categorized as hazardous on the basis of Table 4-1, Section A-1 have been disposed of as solid wastes. (1)(2)(5)
	
	Verify that the following approved treatment technologies are used:
	
	- for organics:
	  - incineration
	  - fuel substitution where the units are operated so that destruction of hazardous constituents is at least as efficient, and hazardous emissions are no greater than those produced by incineration
	  - biodegradation
	  - recovery
	  - chemical degradation
	- for heavy metals:
	  - stabilization or fixation
	  - recovery
	- for reactives:
	  - treatments that change the chemical or physical composition of a material so that it no longer exhibits the characteristic of reactivity
	- 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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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.4-81. Treatment residues of wastes categorized as hazardous or special must be managed as hazardous or special waste (FGS-ROK, Chapter 6, Criteria 3k(10)(a) through 3k(10)(d)).	(NOTE: This requirement applies to the treatment residues of all wastes categorized as hazardous or special on the basis of Table 4-1, except for those wastes covered under Section A-1 of the table.)
	
	Verify that treatment residues from the following technologies are managed as hazardous waste: (1)(2)(5)
	
	- for organics:
	  - incineration
	  - fuel substitution where the units are operated so that destruction of hazardous constituents is at least as efficient, and hazardous emissions are no greater than those produced by incineration
	  - degradation by microbial action
	  - recovery
	  - chemical degradation
	- for heavy metals:
	  - stabilization or fixation
	  - recovery
	- for reactives:
	  - treatments that change the chemical or physical composition of a material so that it no longer exhibits the characteristic of reactivity
	- for corrosives:
	  - neutralization of corrosives to a pH value between 6.0 and 9.0
	  - recovery
	  - incineration
	  - chemical or electrolytic oxidation
	  - chemical reduction
	  - stabilization.

Specific Wastes	
KO.4-82. Installations must manage lead-acid batteries that are not recycled as hazardous waste (FGS-ROK, Chapter 6, Criterion 3i(4)).	Determine whether the installation has lead-acid batteries that have exhausted their life-cycle and are not recycled. (1)(3)(5)(9) Verify that the installation manages such batteries as hazardous waste.

(1) BCE (Environmental Planning) (2) DRMO (Defense Reutilization and Marketing Office) (3) Accumulation Point Managers (4) Fire Department (5) TSDF (Treatment, Storage, and Disposal Facility) Officer (6) Safety Manager (7) Transportation Officer (8) Base Supply (9) Generating Activities (10) BES (Bioenvironmental Engineering Services) (11) Base Staff Judge Advocate

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-83. Mercury, nickel-cadmium, lithium, and lead-acid batteries must be treated prior to disposal (FGS-ROK, Chapter 6, Criterion 3k(10)(e)).	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. (2)(5)
CONVENTIONAL EXPLOSIVE ORDNANCE	(NOTE: Generally, conventional explosive ordnance manufacture, assembly, testing, training, intended use, or range management do not constitute hazardous waste management.)
KO.4-84. Installations must identify conventional explosive ordnance as hazardous waste in specific circumstances (AF Policy Letter, 21 January 1994, para IV.c.2, IV.c.3, and IV.c.7).	Verify that the installation identifies conventional explosive ordnance as hazardous waste when: (1)(9) - an authorized official records in writing a determination that the conventional explosive ordnance will be discarded - custodians of the conventional explosive ordnance receive this written determination. (NOTE: The authorized official is identified by being designated in writing.) (NOTE: Prior written authorization is not required if safety or other considerations (such as an emergency response conducted by an Explosive Ordnance Disposal Unit or a response to mitigate an imminent hazard) preclude obtaining prior written authorization.) (NOTE: An authorized official may make a written designation that conventional explosive ordnance that has previously been designated as waste, but for which a legitimate use is subsequently identified, is no longer waste. If the official cannot make this redesignation, the waste remains a hazardous waste until it ceases to exhibit a characteristic of a hazardous waste, or until it has been specifically excluded by regulation (i.e., delisted).)

(1) BCE (Environmental Planning) (2) DRMO (Defense Reutilization and Marketing Office) (3) Accumulation Point Managers (4) Fire Department (5) TSDF (Treatment, Storage, and Disposal Facility) Officer (6) Safety Manager (7) Transportation Officer (8) Base Supply (9) Generating Activities (10) BES (Bioenvironmental Engineering Services) (11) Base Staff Judge Advocate

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.4-85. Authorized individuals must take into account the facts and circumstances applicable to each situation in making a determination to discard (AF Policy Letter, 21 January 1994, para IV.c.4).	Verify that decisions to discard conventional explosive ordnance are based on the facts and circumstances applicable to each situation. (1)(9) (NOTE: The following guidelines should be used in making the determination to discard: - a determination to discard excess conventional explosive material that is safe and stable in normal logistical environments may be made only after all efforts have been exhausted to reuse, recycle, recover, or sell such material - a determination to discard conventional explosive ordnance that may be unstable or unsafe to store or transport should be made by an authorized official after conducting appropriate testing or inspection, if conditions allow, or if it is readily apparent that there is no reasonable alternative to discarding the material.)

(1) BCE (Environmental Planning) (2) DRMO (Defense Reutilization and Marketing Office) (3) Accumulation Point Managers (4) Fire Department (5) TSDF (Treatment, Storage, and Disposal Facility) Officer (6) Safety Manager (7) Transportation Officer (8) Base Supply (9) Generating Activities (10) BES (Bioenvironmental Engineering Services) (11) Base Staff Judge Advocate

Table 4-1

Characteristics of Hazardous Wastes and Lists of Hazardous Wastes and Hazardous Materials

(FGS-ROK Appendix A)

A-1 CHARACTERISTICS OF HAZARDOUS WASTE

A. General

1. A solid 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, recordkeeping, 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.

(continued)

b. It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm or 0.250 in. per year 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 Table. 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.

(continued)

A-2 LISTS OF HAZARDOUS WASTES

A. General

1. A solid 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.

(continued)

(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 only is listed 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 propert 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 only listed for toxicity.)

(continued)

A-3 LISTS OF SPECIAL WASTES

A. Waste acid (limited to waste acid with pH values of 2.0 or less)

B. Waste alkali (limited to waste alkali with pH values of 12.5 or more)

C. Waste oil (limited to waste oil with 5 percent or more of oil, and excluding waste containing PCB)

D. Waste organic solvents:

1. Halogen family (limited to substances specified below and generated from business activities using substances containing halogens):

   a. Chlorobenzene
   b. Dichlorobenzene
   c. Dichlorodifluoromethane
   d. Dichloroethane
   e. Dichloromethane
   f. Dichlorophenol
   g. Monochlorophenol
   h. Tetrachloroethylene
   i. Tetrachloromethane
   j. Trichloroethane
   k. Trichloroethylene
   l. Trichlorofluoromethane
   m. Trichloromethane
   n. Trichlorophenol
   o. Trichlorotrifluoroethane

2. Nonhalogen family (limited to substances specified below and generated from business activities using substances containing nonhalogens):

   a. Acetone
   b. Benzene
   c. Buthanol
   d. Buthylacetate
   e. Cresol
   f. Cyclohexane
   g. Cyclohexanone
   h. Decahydronaphthalene
   i. Diacetin
   j. Diethyleneether
   k. Diethyleneglycol
   l. Diethylsulfoxide
   m. Dimethylformamide
   n. Dimethylsulfide
   o. Dioxan
   p. Ethanol
   q. Ethylacetate
   r. Ethylbenzene

(continued)

s. Ethyleneglycol
t. Ethylether
u. Ethylglycol
v. Ethylphenol
w. Formaldehyde
x. Glyceroltriacetate
y. Kerosene
z. Methanol
aa. Methylacetate
ab. Methylethylketone
ac. Methylisobuthylketone
ad. Methylphenol
ae. n-Butylalcohol
af. n-Hexane
ag. Nitrobenzene
ah. Phenol
ai. Propanol
aj. Propyleneglycol
ak. Pyridin
al. Terpentin
am. Tetrahydrofuran
an. Tetrahydronaphthalene
ao. Toluene
ap. Triethyleneglycol
aq. Xylene

E. Waste synthetic high polymers

1. Other waste synthetic polymers
2. Waste paint and waste lacquer
3. Waste synthetic fiber
4. Waste synthetic leather
5. Waste synthetic resins
6. Waste synthetic rubber

F. Waste asbestos (limited to the waste asbestos generated during producing/processing asbestos or removing buildings/structures)

G. Slag (limited to the slag containing substances specified in V. below)

H. Slag-dust slag (limited to the slag-dust containing substances specified in V. below)

I. Waste molding sand and waste sandblast (limited to the waste molding sand and waste sandblast that contain substances specified in V. below)

J. Waste fire resistant materials and pieces of pottery before secondary bake (limited to the waste fire resistant materials and pieces of pottery that contain substances specified in V. below)

K. Incineration residues (limited to the incineration ashes that contain substances specified in V. below)

(continued)

Table 4-1 (continued)

L. Material disposed by solidification or stabilization (limited to material that contains substances specified in V. below)

M. Waste catalyzers (limited to the waste catalyzers that contain substances specified in V. below)

N. Waste adsorbents and waste absorbents (limited to the material that contains the substances specified in V. below)

O. Waste agricultural chemicals (limited to agricultural chemicals generated during manufacturing and selling)

P. Waste containing PCBs

1. Liquid waste (limited to PCB content of 50 mg/L or more)
2. Nonliquid waste (limited to PCB content of 50 mg/L or more in the extraction liquid)

Q. Sludge (limited to water content of less than 95 percent or solid content of 5 percent or more)

1. Sludge from wastewater treatment plants (limited to sludge discharged from the water pollution protection facility in a business that has obtained a construction permit for a facility discharging wastewater and discharged from the complex industrial wastewater final disposal facility, pursuant to Article 10.1 and 25 of the Water Environmental Preservation Law. However, sludge from filtration plants is excluded.)
2. Manufacturing process sludge (limited to sludge discharged during an industrial manufacturing process)
3. Designated sludge (limited to sludge containing substances specified in V. below and discharged from a business designated and notified by the Minister of Environment)

R. Waste plaster

S. Waste lime

T. Animal carcasses

1. Processed leather residue (limited to leather or fur generated during manufacturing and processing)
2. Processed meat residue (fur and contents in the internal organs generated during butchering livestock, and livestock's excrement is excluded)
3. Processed marine residue (horny substances, such as shells, are excluded)

U. Other materials designated/notified by the Minister of Environment as harmful to the environment or to public health.

V. Hazardous substances contained in slag, waste molding sand, waste sand, waste fire resistant materials, pieces of pottery, incineration ashes, stabilizing or solidifying disposal materials, waste catalyzers, waste adsorbents, waste absorbents, and sludge

1. Lead or its compounds (lead contents of 3 mg/L or more in the extraction liquid as a result of extraction procedure test by the official test method for waste)
2. Copper or its compounds (copper contents of 3 mg/L or more in the extraction liquid)

(continued)

Table 4-1 (continued)

3. Arsenic or its compounds (arsenic contents of 1.5 mg/L or more in the extraction liquid)
4. Mercury or its compounds (mercury contents with 0.005 mg/L or more in the extraction liquid)
5. Cadmium or its compounds (cadmium contents of 0.3 mg/L or more in the extraction liquid)
6. Hexavalent chromium or its compounds (hexavalent chromium contents of 1.5 mg/L or more in the extraction liquid)
7. Cyanide compounds (cyanide contents of 1 mg/L or more in the extraction liquid)
8. Organic phosphorus compounds (organic phosphorus contents of 1 mg/L or more in the extraction liquid)
9. Tetrachloroethylene (tetrachloroethylene contents of 0.1 mg/L or more in the extraction liquid)
10. Trichloroethylene (trichloroethylene contents of 0.3 mg/L or more in the extraction liquid).

(continued)

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 Number.

(continued)

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] Chemical Abstracts Service Number.

(continued)

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]

(continued)

Table 4-1 (continued)

USEPA Waste No.[1]	Hazardous Waste	Hazard Code
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 planting (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.

(continued)

Chart A.4

LIST OF HAZARDOUS WASTE/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
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 alchol	107186	1000	P005	100

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
Ammonium bicarbonate	1066337			5000
Ammonium bichromate	7789095			10
Ammonium bifluonde	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 123922 626380 625161			5000

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
Arcolor 1232	11141165			1
Aroclor 1242	53469219			1
Aroclor 1248	12672296			1
Aroclor 1254	11097691			1
Aroclor 1260	11096825			1
Arsenic++	7440382			1
Arsenic acid H_3AsO_4	1327522 7778394		P010	1
Arsenic disulfide	1303328			1
Arsenic oxide As_2O_3	1327533		P012	1
Arsenic oxide As_2O_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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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	1
Benzene, 1-(Chloromethyl)-4-Nitro-	100141	500/10,000		

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156		U038	1
Benzene, 1-bromo-4-phenoxy-	101553		U030	100
Benzenearsonic 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-Benzenedicarbosylic acid, diethyl ester	84662		U088	1000
1,2-Benzenedicarbosylic 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-diisocyanotomethyl- (R,T)	584849 91087 264716254		U223	100
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-(methylamino)ethyl]- (R)	51434		P042	1000
Benzeneethanamine, alpha, alpha-dimethyl-	122098		P046	5000
Benzene, hexachloro-	118741		U127	10

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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-chloroethylidene)bis[4-chloro-	50293		U061	1
Benzene, 1,1'-(2,2,2-tri-chloroethylidene)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[rst]pentaphene	189559		U064	10
Benzo[ghi]perylene	191242			5000
2H-1-Benzophyran-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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
3,4-Benzopyrene	50328		U022	1
p-Benzoquinone	106514		U197	10
Benzotrichloride (C,R,T)	98077	100	U023	10
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-(((Methylamino)Carbonyl)Oxy-lmino)-, (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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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-meth- oxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5, 7a-tetrahydro-1H- pyrrolizine-1-yl ester, [1S-[1- alpha(Z), 7(2S*,3R*), 7a-alpha]]-	303344		U143	10
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Cadmium stearate	2223930	1000/10,000		1
Calcium arsenate	7778441	500/10,000		1
Calcium arsenite	52740166			1
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-ethaneiylbis, 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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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
Chlorphyrifos	2921882			1
Chloroxuron	1982474	500/10,000		1
Chlorthiophos	21923239	500		1
Chromic acetate	1066304			1000
Chromic acid	11115745 7738945			10
Chromic acid H_2CrO_4, calcium salt	13765190		U032	10
Chromic chloride	10025737	1/10,000		1
Chromic sulfate	10101538			1000
Chromium++	7440473			5000
Chromous chloride	10049055			100
Chrysene	218019		U050	100

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Colbalt, ((2,2'-(1,2-ethanediylbis (Nitrilomethylidyne)) Bis(6-fluoro-phenolato))(2-)-N,N',O,O')-,	62207765	100/10,000		1
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
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 complexes) 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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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-hexachloro-	77474		U130	10
Cyclophosphamide	50180		U058	10
2,4-D Acid	94757		U240	100
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
1,2-Dibromo-3-chloropropane	96128		U066	1

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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 (mixture)	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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
1,2:3,4-Diepoxybutane (I,T)	1464535	500	U085	10
Diethyl chlorophospate	814493	500		1
Diethylamine	109897			100
Diethylarsine	692422		P038	1
Diethylcarbmazine citrate	1642542	100/10,000		1
1,4-Diethylenedioxide	123911		U108	100
Diethylhexyl phthalate	117817		U028	100
N,n'-Diethylhydrazine	1615801		U086	10
O,O-Diethyl S-methyl dithiophosphate	3288582		U087	5000
Diethyl-p-nitrophenyl phosphate	311455		P041	100
Diethyl phthalate	84662		P088	1000
O;O-Diethyl O-pyrazinyl phosphorothioate	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-Dimethanon-aphth[2,3 b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1a-alph, 2-beta, 2a-alpha, 3-beta, 6-beta	60571		P037	1
6a-alpha, 7beta, 7a-alpha)-2,7:3,6 Dimethanonaphth[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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Dimefox	115264	500		1
Dimethoate	60515	500/10,000		10
Dimethyl Phosphorochloridothioate	2524030	500		1
Dimethyl sulfate	77781	500		1
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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Disphosphoramide, 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
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	10
Ethane, 1,1'-oxybis(2-chloro-	111444		U025	10

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] 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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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 55488874			1000
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
Fluentil	4301502	100/10,000		1
Fluoranthene	206440		U120	100
Fluorene	86737			5000
Fluorine	7782414	500	P056	10
Fluoroacentamide	640197	100/10,000	P057	100
Fluoracetic 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
Fosthietan	21548323	500		1
Fuberidazole	3878191	100/10,000		1
Fulminic acid, mercury(2) salt (R,T)	628864		P065	10

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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-[[(methylnitrosoamino)-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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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
Isoproplymethylpryrazolyl 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
Lead, bis(acetato-O)tetrahydroxytri	1335326		U146	100
Lead chloride	7758954			100
Lead fluoborate	13814965			100
Lead iodide	10101630			100

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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-benzodioxathiepin, 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] pentalen-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
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	500
Methapyrilene	91805		U155	5000

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
Methyl iodide	74884		U138	100
Methyl isobutyl ketone	108101		U161	5000
Methyl isocyanate	624839	500	P064	##
Methyl isothiocyante	556616	500		1
2-Methyllactonitrile	75865		P069	10
Methyl mercaptan	74931	500	U153	100
Methyl methacrylate (I,T)	80626		U162	1000
Methyl parathion	298000		P071	100
Methyl phenkapton	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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
Mustard gas	505602	500		1
Naled	300765			10
5,12-Naphthaacenedione, 8-acetyl-10-[3 amino-2,3,6-tri-deoxy-alpha-L-lyxo-hexopyranosyl)-7,8,9,10-tetrahydro-6,8,11-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
Nickel hydroxide	12054487			10
Nickel nitrate	14216752			100
Nickel sulfate	7786814			100
Nicotine & salts	54115	100	P075	100

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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
Octamethylpyrophosphoramide	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-dicarboxylic acide	145733		P088	1000
Oxamyl	23135220	100/10,000		1

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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
Perachloroethylene	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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Phosphonothioic acid, methyl-, s-(2-(bis(1- methylethyl)amino) ethyl o-ethyl ester	50782699	100		1
Phosphonothioic acid, methyl-, 0-(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	#
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
Phosphorodithoic acid, O,O-dimethyl S-[2(methyl-amino)-2-oxoethyl] ester	60515		P044	10
Phosphorofluondic acid, bis(1-methylethyl)ester	55914		P043	100
Phsphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56382		P089	10
Phosphorothioic acid, O,[4[(dimethylamino)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 oxycloride	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		
Piperidine	110894	1000		
Piperidine, 1-nitroso-	100754		U179	10

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Piprotal	5281130	100/10,000		1
Primifos-ethyl	23505411	1000		1
Plumbane, tetraethyl-	78002		P110	10
PCBs (See Aroclor)	1336363			1
Potasium 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-proply-	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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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 ester (I,T)	80626		U162	1000
2-Propen-1-o1	107186		P005	100
Propiolactone, beta-	57578	500		1
Propionic acid	79094			5000
Propionic acid, 2-(2,4,5-trichlorophenoxyl)-	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-o1	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
Pyridine, 4-nitro-, 1-oxide	1124330	500/10,000		1
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	54115		P075	100

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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)diethoxymethyl-	3037727	1000		1
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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 10039324 10140655			5000
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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Thallium selenite	12039520		P114	1000
Thallium sulfate	7446186 10031591	100/10,000	P115	100
Thallous carbonate	6533739	100/10,000		100
Thallous chloride	7791120	100/10,000		100
Thallous malonate	2757188	100/10,000		1
Thallous 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 [(H2N)C(S)] 2NH	541537		P049	100
Thiomethanol (I,T)	74931		U153	100
Thionazin	297972	500		100
Thioperoxydicarbonic diamide [(H2N)C(S)] 2S2, 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 823405 25376458		U221	10
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	
2,4,5-TP acid	93721		U233	10
2,4,5-TP esters	32534955			100

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
Trichloromethanesulfenyl chloride	594423		P118	100
Trichloromonofluoromethane	75694		U121	5000
2,3,4-richlorophenol	15950660			
2,3,5-Trichlorophenol	933788			
2,3,6-Trichlorophenol	933755			
2,4,5-Trichlorophenol	95954		U230	10
2,4,6-Trichlorophenol	88062		U231	10
3,4,5-Trichlorophenol	609198			
2,4,5-Trichlorophenol	95954		U230	10
2,4,6-Trichlorophenol	88062		I231	10
Trichlorphenylsilane	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
Trypan blue	72571		U236	10

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Unlisted Hazardous Wastes Characteristic of Corrosivity	NA		D002	100
Unlisted Hazardous Wastes Characteristic:	NA			
Arsenic (D004)	NA		D004	1
Barium (D005)	NA		D005	1000
Cadmium (D006)	NA		D006	10
Chromium (D007)	NA		D007	10
2,4-D (D016)	NA		D016	100
Endrin (D9012)	NA		D012	1
Lead (D008)	NA		D008	
Lindane (D013)	NA		D013	1
Mercury (D009)	NA		D009	1
Metoxychlor (D014)	NA		D014	1
Selenium (D010)	NA		D010	10
Silver (D011)	NA		D011	1
Toxaphene (D015)	NA		D015	1
2,4,5-TP (D017)	NA		D017	100
Vinyl chloride (D043)	NA		D043	1
Unlisted Hazardous Wastes Characteristic of Ignitability	NA		D001	00
Unlisted Hazardous Wastes Characteristic Reactivity	NA		D003	00
Uracil mustard	66751		U237	10
Uranyl acetate	541093			100
Uranyl nitrate	10102064 36478769			100
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_2O_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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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 dimethosy-18-[(3,4,5-trimethoxy-benzoyl)oxy]-, methyl ester (3-beta, 16-beta,17-alpha, 18-beta,20-alpha)-	50555		U200	5000
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_3P_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
Zirconium tetrachloride	10026116			5000
F001			F001	10

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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				
h. Trichlorofluoromethane	95501		U070	100
i. 1,1,2-Trichloroethane	75694		U121	5000
	79005		U227	100
F003			F003	100
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		

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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 desicants, 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 desicant 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	#

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
Wastewater treatment sludge from the production of molyodate orange pigments.				
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
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.				

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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.				
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
Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.				

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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	#
American Petroleum Institute (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	#
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

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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	#
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	#
Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.				

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
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
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
Vicinais 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.				

(continued)

Table 4-1 (continued)

Hazardous Waste/Substances	CAS No.[1]	Threshold Planning[2] Quantity (pounds)	USEPA Waste Number	RQ (pounds)[3]
K116			K116	10
Organic condensate from the solvent recovery column in the production of toluene disocyanate 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 ethylenebisdithiocarbamic 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.				
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 [0.37 kg] RQ is a statutory RQ.

(continued)

Table 4-1 (continued)

** 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.

Table 4-2

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-y1-
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

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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-,
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-propynyl-
U018	benz[a]anthracene
U094	1,2-benzanthracene, 7,12-dimethyl-
U012	benzenamine (i,t)
U014	benzenamine, 4,4-carbonimidoylbis(N,N- dimethyl-
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-chlorophenyl)-alpha-hydroxy, ethyl ester
U030	benzene, 1-bromo-4-phenoxy-
U035	benzenebutanoic acid, 4-[bis (2-chloroethyl)amino]-
U037	benzene, chloro-
U221	benzenediamine, ar-methyl-
U028	1,2-benzendicarboxylic acid, [bis(2-ethyl-hexyl)]ester

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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)
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-

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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[rst]pentaphene
U248	2-H-1-benzopyran-2-on2, 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
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

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
U074	2-butene, 1,4-dichloro- (i,t)
U143	2-butenoic 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), 7aalpha]]-
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-ethanediylbis-, 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
U039	p-chloro-m-cresol
U041	1-chloro-2,3-epoxypropane

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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 H2CrO4, 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

(continued)

Table 4-2 (continued)

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

(continued)

Table 4-2 (continued)

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-

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
U228	ethene, trichloro
U112	ethyl acetate (i)
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

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
U132	hexachlorophene
U243	hexachloropropene
U133	hydrazine (r,t)
U086	hydrazine, 1,2-diethyl-
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)

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
U029	methane, bromo-
U045	methane, chloro- (i,t)
U046	methane, chloromethoxy-
U068	methane, dibromo-
U080	methane, dichloro-
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,4,5,5,5a,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)

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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-hexopyranosyl)oxyl]-7-8,9,10-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'-dimethyl-(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

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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
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-

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
U150	l-phenylalanine, 4-[bis(2-chloroethyl)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-
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

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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
U205	selenium sulfide
U205	selenium sulfide SeS2 (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)

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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
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

(continued)

Table 4-2 (continued)

USEPA Hazardous Waste No.	Substance
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.

Table 4-3

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
D038	Pyridine	110-86-1	0.04	5.0 [2]

(continued)

Table 4-3 (continued)

USEPA HW No.	Constituent	CAS No.	Chronic toxicity reference level	Regulatory Level(mg/L)
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.

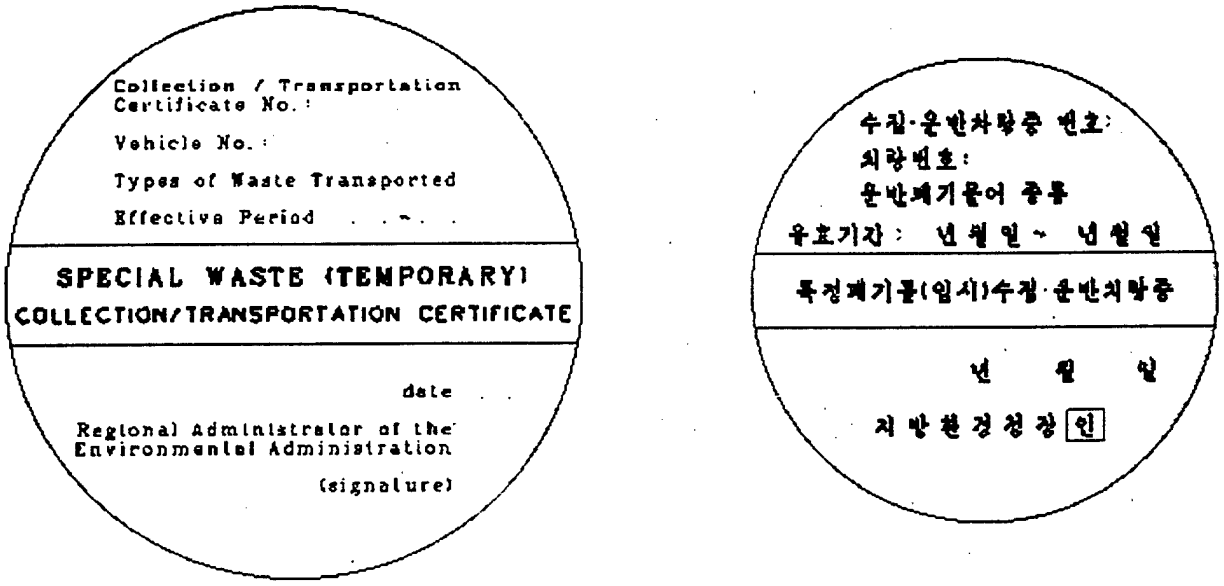
[2] Quantitation limit is greater than the calculated regulatory level. Therefore, the quantitation limit becomes the regulatory level. (Source: Federal Register 55:61, page 11804.)

Table 4-4

Vehicle Identification of Special Waste (Temporary) Collection and Transportation

(FGS-ROK, Chapter 6, Figure 6.1)

This table contains the "vehicle identification of special waste (temporary) collection and transportation" issued by the Regional Administrators of Environmental Administration. It must be attached to the vehicles used for special waste collection and transportation.



-Diameter : 10 cm
-Ground Color : yellow (white for "temporary vehicles")

Figure 6.1

Table 4-5

Potentially Incompatible Hazardous Wastes
(40 CFR 264, Appendix V)

This table contains examples of potentially incompatible wastes, waste components, and materials, along with the harmful consequences that result from mixing materials in one group with materials in another group. The list is intended as a guide to indicate the need for special precautions when managing these potentially incompatible waste materials or components. It is not intended to be exhaustive. Operators must, as the regulations require, adequately analyze their wastes so as to avoid creating uncontrolled substances or reactions of the type listed below, whether listed below or not.

The mixing of a *Group A* material with a *Group B* material may have the potential consequences as noted.

Group 1-A	Group 1-B
Acetylene sludge	Acid sludge
Alkaline caustic liquids	Acid and water
Alkaline cleaner	Battery acid
Alkaline corrosive liquids	Chemical cleaners
Alkaline corrosive battery acid	Electrolyte, acid
Caustic wastewater	Etching acid liquid or solvent
Lime sludge and other corrosive alkalies	Pickling liquor and other corrosive acids
Lime wastewater	Spent acid
Lime and water	Spent mixed acid
Spent caustic	Spent sulfuric acid

Potential Consequences: heat generation, violent reaction.

Group 2-A	Group 2-B
Aluminum	Any waste in Group 1-A or 1-B
Beryllium	
Calcium	
Lithium	
Magnesium	
Potassium	
Sodium	
Zinc powder	
Other reactive metals and metal hydrides	

Potential Consequences: fire or explosion, generation of flammable hydrogen gas.

(continued)

Group 3-A	Group 3-B
Alcohols Water	Any concentrated waste in Groups 1-A or 1-B Calcium Lithium Metal hydrides Potassium SO_2Cl_2, $SOCl_2$, PCl_3, CH_3SiCl_3 Other water-reactive waste

Potential Consequences: fire, explosion, heat generation, generation of flammable or toxic gases.

Group 4-A	Group 4-B
Alcohols Aldehydes Halogenated hydrocarbons Nitrated hydrocarbons Unsaturated hydrocarbons Other reactive organic compounds and solvents	Concentrated Group 1-A, or Group 1-B wastes Group 2-A wastes

Potential Consequences: fire or explosion, violent reaction.

Group 5-A	Group 5-B
Spent cyanide and sulfide solutions	Group 1-B wastes

Potential Consequences: generation of toxic hydrogen cyanide or hydrogen sulfide gas.

Group 6-A	Group 6-B
Chlorates Chlorine Chlorites Chromic acid Hypochlorites Nitrates Nitric acid, fuming Perchlorates Permanganates Peroxides Other strong oxidizers	Acetic acid and other organic acids Concentrated mineral acids Group 2-A wastes Group 4-A wastes Other flammable and combustible wastes

Potential Consequences: fire, explosion, violent reaction.

Table 4-6

Technical Management Checklist for Waste Disposal Facility Contracts

(FGS-ROK Table 6-2)

Facility	Checking Items
Intermediate Disposal Facility	
a. General	• Appropriateness of type and quantity of waste incinerated • Physical conditions for the floor of storage or main disposal facility • Arrangement of temperature recorder and appropriateness of its operation • Appropriate action plan in case of accidents • Drainage of water in pipes of facility or equipment that are likely to freeze • Appropriate operation of facility and equipment in accordance with operation guide • Availability of fire extinguishers
b. Incineration Facility and High Temperature Destruction Facility	• Conditions of fireproof material • Normal operation of combustion burner and extra burner • Normal operation of safety facilities • Normal operation of preventive facilities • Pollutant concentrations in off-gas • Condition of cleanliness in the combustion chamber, etc. • Normal operation of cooling pumps • Air density and fuel ratio • Execution of periodical inspection • Startup temperature and closeout during accidents • Appropriateness of temperature and pressure
c. Shredding/Cutting Facility	• Conditions of shredding and cutting equipment • Method to contain particulate
d. Melting Facility	• Normal operation of temperature control equipment • Normal operation of disposal facility for toxic gas
e. Graduation, Refining, and Reaction Facility	• Erosion or damage of evaporation and graduation tank • Normal operation of temperature control equipment • Normal operation of disposal facility for toxic gas • Execution of periodical cleaning
f. Oil and Water Separation Facility	• Damage of water collection and transportation facility • Erosion or damage of separated oil storage tank • Cleanliness of screen from foreign substances • Normal operation of equipment controlling amount of waste oil • Periodical replacement or washing of filter cloth

(continued)

Table 4-6 (continued)

Facility	Checking Items
g. Coagulation/Sedimentation Facility	• Normal operation of agitation equipment • Appropriate removal of sludge
h. Dewatering Facility	• Normal operation of dewatering equipment • Wastewater discharging from dewatering process • Periodical replacement or washing of filter cloth • Appropriate removal of foreign substances
i. Drying Facility	• Normal operation of drying temperature control equipment • Availability of a cover to prevent inflow of rain • Normal operation of disposal facility for toxic gas
j. Solidification Facility	• Normal operation of mixing equipment • Mixture ratio (cement, water, and stabilizer) • Loss of mixed substances out of the curing facility • Cleaning of mixers
k. Stabilization Facility	• Normal operation of disposal facility for toxic gas
2. Final Disposal Facility	
a. General	• Damage to security fence • Availability of landfill area signs and recording its content • Normal operation of weighing equipment • Subsidence of the ground of landfill areas • Inspection of underground water wells
b. Isolation Type Landfill	• Damage to floor, outside walls, and partitions • Availability of a cover to prevent inflow of rain
c. Management and Sedimentation Type Landfill	• Damage to watertight materials • Damage to leachate collection wells and transportation equipment • Periodical cleaning of leachate collection wells and transportation equipment • Damage to water controlling tank • Normal operation of leachate disposal facility • Quality of discharging water • Normal operation of discharging gas disposal facility
d. Stabilization Landfill Facility	• Safety of embankment
3. Other Facility that the Minister of Environment notifies and recognizes safety to dispose of special waste	• Items notified by USFK ICs and facility managers after consultation with the MOE

INSTALLATION:	COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 5

NATURAL RESOURCES MANAGEMENT

Korea ECAMP

SECTION 5

NATURAL RESOURCES MANAGEMENT

A. Applicability of this Section

This chapter applies to any Air Force (AF) installation with improved, semi-improved, and unimproved grounds. Included are required plans and programs needed to ensure proper protection and management of natural resources such as soil, water, plants, and wildlife.

The regulatory requirements in this section are based on DOD regulations that apply at overseas installations. Management Practices (MPs) are derived from DOD regulations and other documents that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 13 addresses required plans and programs for the protection, enhancement, and management of natural resources and endangered or threatened species. These plans and programs are needed to ensure that military actions are not likely to jeopardize the continued existence of natural resources and any biological species declared endangered or threatened by the Korean government. The Korean government designates protection areas where the preservation of natural ecosystems is specially needed and imposes strict restrictions on collecting, importing, or exporting endangered animals or plants or those wild species that have been specified by the government.

C. U.S. Air Force Documents

- None.

D. Responsibility for Compliance

- Base Civil Engineering (BCE) is responsible for funding, supervising, controlling, and managing installation natural resources.

- The Natural Resources Manager is responsible for preparing management plans, cooperative agreements, budgets, and the annual natural resources report. The natural resources manager also implements and controls all activities that promote natural resources management. On installations without a full-time Natural Resources Manager, these duties would normally be assigned to the environmental coordinator or community planner.

E. Definitions

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, on USFK-controlled installations (FGS-ROK, 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-ROK, Chapter 13, Definitions).

- *Conservation* - wise management and use of natural resources to provide the best public benefits for present and future generations (FGS-ROK, Chapter 13, Definitions).

- *Endangered Species* - any species of flora or fauna designated and declared by the Minister of Environment (MOE) and World Agreement for Endangered Species, 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 and to restrictions on foreign trade according to the Foreign Trade Agreement for Endangered Species (See Table 5-1) (FGS-ROK, Chapter 13, Definitions).

- *Management Plan* - a document describing natural resources, and their quantity and condition, and actions to ensure conservation and good stewardship (FGS-ROK, Chapter 13, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Natural Ecosystem Preservation Area* - areas which fall under one of the following areas designated and declared by the MOE (see Table 5-2) (FGS-ROK, Chapter 13, Definitions):
    1. an area that is worthy of scientific research since it preserves the originality of natural ecosystems or has abundant natural resources
    2. an area that requires preservation for scientific research or natural scenery since its topographic or geological features are unique
    3. an area that is worthy of preservation, where endangered species or Korean native species grow
    4. an area that represents diverse ecosystems or samples of ecosystems
    5. an area that requires special protection of other natural ecosystems.

- *Natural Resource* - all living and inanimate materials supplied by nature that are of aesthetic, ecological, educational, historical, recreational, scientific, or other value (FGS-ROK, 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-ROK, Chapter 13, Definitions).

- *Specified Wild Species* - any species of flora or fauna, listed in Table 5-3 or designated and declared by the MOE, whose continued existence is, or is likely to be, threatened or whose species is worthy of protection for scientific research, and is therefore subject to special protection from destruction or unbalance in a natural ecosystem (FGS-ROK, Chapter 13, Definitions).

NATURAL RESOURCES MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.5-1 through KO.5-4	(1)(2)
Natural Resources	KO.5-5 through KO.5-9	(1)
Endangered or Threatened Species	KO.5-10 through KO.5-12	(1)
Fish and Wildlife	KO.5-13	(1)
Grounds Management	KO.5-14 through KO.5-17	(1)

(a) CONTACT/LOCATION CODE:

(1) Natural Resources Manager (or Environmental Coordinator)
(2) Base Staff Judge Advocate

NATURAL RESOURCES MANAGEMENT

Records To Review

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

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

People To Interview

- Natural Resources Manager (or Environmental Coordinator)
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: NATURAL RESOURCES MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ALL INSTALLATIONS	
KO.5-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.5-2. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (2) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.5-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning natural resources have been issued since the finalization of the manual. (1)(2) Verify that the installation is in compliance with newly issued regulations.
KO.5-4. The Installation Natural Resource Manager should be included in the coordination process for all actions that may affect the installation's natural resources (MP).	Verify that the Natural Resources Manager is included in the coordination process for all actions that may affect the installation's natural resources. (1)

(1) Natural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

COMPLIANCE CATEGORY: NATURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
NATURAL RESOURCES	
KO.5-5. Installations must develop programs for conserving, managing, and protecting natural resources (FGS-ROK, Chapter 13, Criteria 3a).	Verify that the installation considers ROK conservation practices in developing a program for conserving, managing, and protecting natural resources. (1)
KO.5-6. Installations must have management plans for certain resources where these resources exist (FGS-ROK, Chapter 13, Criterion 3b).	Determine whether the installation has any of the following resources: (1) - land (soil and water) - forest - fish and wildlife - outdoor recreation. Verify that the installation has management plans for such resources.
KO.5-7. The installation's land management plan should address certain topics (MP).	Verify that the land management plan reflects a comprehensive effort to educate installation personnel. (1) Verify that the plan includes programs and policies and reduces nonpoint sources of water pollution, including: - fertilizer application - pesticide use - stormwater runoff - waste oil recovery - grounds maintenance - car washing - erosion/sedimentation control.
KO.5-8. Technical instruction should be provided for personnel engaged in the care of the installation (MP).	Verify that the installation provides periodic and comprehensive technical instruction concerning land preparation, soil management, fertilization, pruning, spraying, and other horticulture skills to personnel engaged in the care of the installation. (1)

(1) Natural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

COMPLIANCE CATEGORY: NATURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.5-9. Personnel who manage natural resources must be properly trained (FGS-ROK, Chapter 13, Criterion 3g).	Verify that personnel who manage natural resources are properly trained. (1)
ENDANGERED OR THREATENED SPECIES	
KO.5-10. Installations must manage endangered species (FGS-ROK, Chapter 13, Criteria 3c through 3e).	Verify that the IC maintains a current list of species determined to be threatened or endangered by the host nation. (1) (NOTE: Tables 5-1 and 5-3 together constitute such a list.) Verify that the IC take reasonable steps to protect and enhance known endangered species and their habitat. Verify that ROK officials are normally notified of the discovery of any endangered species or specified wild species not previously known to be present on the installation. Verify that, if it is financially and otherwise practical, surveys for endangered species and specified wild species are conducted. Verify that, if it is financially and otherwise practical, the installation supports ROK-initiated surveys.
KO.5-11. Installations must protect specified wild species (FGS-ROK, Chapter 13, Criterion 3k).	Verify that no specified wild species is captured, collected, transplanted, exported, processed, distributed, or stored. (1) (NOTE: The requirements of this checklist item may be waived in specifically permitted cases.)
KO.5-12. Exporting/ importing of species without specific approval is prohibited (FGS-ROK, Chapter 13, Criterion 3L).	Verify that no species is exported, imported, or carried without approval from the MOE. (1) (NOTE: Dogs and cats do not require such approval.)

(1) Natural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

COMPLIANCE CATEGORY: NATURAL RESOURCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
FISH AND WILDLIFE	
KO.5-13. ICs must emphasize the maintenance and protection of habitat favorable to the local fish and wildlife (FGS-ROK, Chapter 13, Criterion 3h).	Verify that habitats that are favorable to the reproduction and survival of indigenous fish and wildlife are maintained and protected. (1)
GROUNDS MANAGEMENT	
KO.5-14. Installation grounds must be maintained in ways that meet designated mission use and assure harmony with the natural landscape (FGS-ROK, Chapter 13, Criteria 3f).	Verify that installation grounds are maintained in ways that meet designated mission use and assure harmony with the natural landscape. (1)
KO.5-15. Land and vegetative management operations must be consistent with modern conservation and land use principles (FGS-ROK, Chapter 13, Criterion 3i).	Verify that land and vegetative management at the installation is consistent with modern conservation and land use principles. (1)
KO.5-16. A protective vegetative cover must be used to control dust and/or stabilize sites (FGS-ROK, Chapter 13, Criterion 3j).	Verify that the installation uses a protective vegetative cover (or other standard soil erosion/sediment control measures) to control dust and/or stabilize sites. (1)
KO.5-17. The installation should have a mitigation and monitoring plan (MP).	Verify that there is a mitigation and monitoring plan for environmental compliance. (1) Verify that the installation has developed plans to preserve, protect, and acquire t water supplies necessary to support all natural resources projects and programs.

(1) Natural Resources Manager (or Environmental Coordinator) (2) Base Staff Judge Advocate

Table 5-1

Endangered/Threatened Species

(FGS-ROK Table 13-1)

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
Crane, Japanese	*Grus japonensis*	China, Japan, Korea, Russia
Dhole (Asiatic wild dog)	*Cuon alpinus*	Korea, China, India, Southeast Asia
Egret, Chinese	*Egretta eulophotes*	China, Korea
Ibis, Japanese crested	*Nipponia nippon*	Japan, Korea
Stork, oriental white	*Ciconia ciconia boyciana*	Japan, Korea
Woodpecker, Tristam's	*Dryocopus javensis richardsi*	Korea

Table 5-2

Natural Ecosystem Preservation Areas

(FGS-ROK Table 13-3)

1. The Mouth of the Nakdong River Natural Ecosystem Preservation Area a. Location: Pusan City SahaGu, the sea extending over the whole of Shin-pyung, Janglim, and Dadaedong b. Size: 34.208 km^2 [≈21 mi^2] c. Ministry of Environment Notification No. 89-4 (10 March 1989)
2. Jiri Mountain Natural Ecosystem Preservation Area a. Location: JunNam Guryegun, areas over Simwon valley at Sandongmyon and Pia valley at Tojeemyon b. Size: 20.2 km^2 [≈13 mi^2] c. Ministry of Environment Notification No. 89-19 (29 December 1989)
3. Daeam Mountain Natural Ecosystem Preservaiton Area a. Location: Kangwondo Injegun Seohwamyon, Daeam mountain areas b. Size: 1.06 km^2 [≈0.66 mi^2] c. Ministry of Environment Notification No. 89-20 (29 December 1989)
4. Baekun Mountain natural Ecosystem Preservation Area a. Location: JunNam Kangyanggun, Baekun mountain areas over Okryong-myon, Jinsangmyon, and Daapmyon b. Size: 9.74 km^2 [≈6 mi^2] c. Ministry of Environment Notification No. 93-34 (26 April 1993)
5. Daeduk Mountain/Kumdaebong Natural Ecosystem Preservation Area a. Location: Kangwondo Taebak city, Daeduk mountain/Kumdaebong areas b. Size: 4.20 km^2 [≈2.61 mi^2] c. Ministry of Environment Notification No. 93-63 (26 April 1993)

Table 5-3

Specified Wild Species*
(FGS-ROK Table 13-2)

Classification		Scientific Name	Common Name
Amphibia	-14	*Bufo bufo gargarizans* Cantor	Duggeobi
	-7	*Bufo stejnegeri* Schmidt	Mul-duggeobi
	--	*Geoclemys reevesii* Gray	Namsaengi
	-9	*Hyla suweonesis* Kuramoto	Suwon-chong-gaiguri
	-2	*Hynobius leechi* (Boulenger)	Doryongnyong
	-8	*Kaloula borealis* (Barbour)	Maengggongi
	--	*Leiolopisma laterale* (Say)	Domabaem
	-1	*Onychodactylus fischeri* (Boulenger)	Ggori-chirei-doryongnyong
	-4	*Rana amurensis coreana* Okada	Amursan-gaiguri
	-3	*Rana plancyi chosenica* Okada	Gum-gaiguri
	-5	*Rana temporaria dybowski* Gunther	Bukbangsan-gaiguri
Reptilia	-10	*Agkistrodon blomhoffii brevicaudus* Stejneger	Salmosa
	-9	*Agkistrodon saxatilis* Emilianov	Ggachi-salmosa
	-6	*Dinodon rufozonatum rufozonatum* (Cantor)	Neung-gureongi
	-8	*Elaphe rufodorsata* Cantor	Muzachi
	-5	*Elaphe schrenckii* Strauch	Gureongi
	-11	*Eremias argus* Peters	Pyobeom-jangjibaim
	-1	*Geoclemys reevesii* Gray	Namsaengi
	-2	*Leiolopisma laterale* (Say)	Domabaem
	-3	*Natrix vibakari ruthveni* Van Denburgh	Dairyuk-yuhyolmoki
	-7	*Sibynophis collaris* Gray	Bibaribaim
	-12	*Takydromus wolteri* Fischer	Jul-jangjibaim
	-13	*Trionyx maackii* Brant	Jara
	-4	*Zamenis spinalis* (Peters)	Silbaim
Insecta	-20	*Acalolepta fraudatorix* Bates	Udan-hanulso
	-17	*Anoplodera variicornis* Dalman	Alraksuyeomsanggot-hanulso

(continued)

Table 5-3 (continued)

Classification	Scientific Name	Common Name
-4	*Aporia crataegi* Linne	Sangje-nabi
-26	*Chalcophora japonica* Gory	Sonamu-bidan-beolrai
-18	*Chlorophorus diadema* Motschulsky	Beom-hanulso
-25	*Chrysochroa fulgidissima* Schonnerr	Bidan-beolrai
-30	*Cicindela hybrida nitida* Lichtenstein	Chuhong-gil-yapjabi
-23	*Dicranocephalus adamsi* Pascoe	Sasum-pungdaingi
-9	*Dilipa fenestra* Leech	Yurichang-nabi
-14	*Eumenis autonoe* Esper	San-guldduk-nabi
-11	*Fabriciana nerippe* C. & R. Felder	Wang-enjeom-pyobeom-nabi
-3	*Grapium sarpedon* Linne	Chong-ddy-jebi-nabi
-28	*Gymnopleurus mopsus* Pallas	So-ddongguri
-6	*Lampides boeticus* Linne	Mulgyol-bugeon-nabi
-21	*Melolontha frater* Arrow	Kun-pungdaingi
-24	*Metopodentus inclinatus* Motschulsky	Top-sasum-beolrai
-12	*Neptis raddei* Bremer	Eri-sejul-nabi
-13	*Nymphalis antiopa* Linne	Sinbu-nabi
-19	*Palimna liturata* Bates	Alraksuyeom-hanulso
-15	*Parantica sits* (Kollar)	Wang-nabi
-2	*Parnassius bremeri* Bremer	Bulgun-geom-mosi-nabi
-29	*Polyphylla laticollis* Lewis	Suyeom-pungdaingi
-8	*Protantigius superans* Oberthur	Gipunsan-bugeon-nabi
-16	*Psephactus remiger* Harold	Ban-nalgai-hanulso
-10	*Sasakia charonda* Hewitson	Wang-osaek-nabi
-1	*Satarupa nymphalis* Speyer	Daewang-palrang-nabi
-27	*Scarabaeus typhon* (Fincher-Waldheim)	Wang-so-ddongguri
-31	*Scarites sulcatus* Oliver	Kun-chorongbak-meonji-beolrai
-5	*Shijimiaeoides divina* Fixsen	Kun-hong-ddy-geombaki-purungeom-bugeon-nabi
-7	*Spindasis takanonis* Matsumura	Ssang-ggori-bugeon-nabi
-22	*Xylotrupes dichotomus* Linne	Jangsu-pungdaingi

(continued)

Table 5-3 (continued)

Classification	Scientific Name	Common Name
Flora -59	*Aconitum chiisanense* Nakai	Ji-i-ba-ggot
-60	*Aconitum koreanum* R. Raymond	Norang-dol-jjogi
-64	*Aconitum trilobum* I. Yang	Sei-bbul-tugu-ggot
-120	*Adenophora grandiflora* Nakai	Doraji-mosi-dai
-108	*Ajuga spectabilis* nakai	Ja-nancho
-79	*Albizzia coreana* Nakai	Wang-jagui-namu
-16	*Aletris fauriei* Lev.	Yeou-ggori-pul
-106	*Anagallidium dichotomum (L.)* Griseb.	Daesung-ssun-pul
-101	*Androsace cortusaefolia* Nakai	Kungang-bom-maji
-95	*Arctous ruber (Rehder et Wilson)* Nakai	Hong-wol-gyul
-98	*Ardisia crenata* Sims	Baik-ryang-gum
-7	*Arisaema negishii* Makino	Seom-cheon-namseong
-8	*Arisaema takesimense* Nakai	Seom-namseong
-53	*Asarum maculatum* Nakai	Gai-jokdori
-15	*Aspidistra elatior* Bl.	Yop-ran
-85	*Berchemia racemosa var. magna* Makino	Meok-neon-chul
-56	*Brasenia schreberi* J.F. Gmel.	Sun-chai
-31	*Bulbophyllum inconspiccum* Max.	Huk-nancho
-91	*Bupleurum euphorbioides* Nakai	Dungdai-siho
-92	*Bupleurum latissimum* Nakai	Seom-siho
-124	*Cacalia pseudo-taimingasa* Nakai	Eori-byongpung
-46	*Calanthe coreana* Nakai	Seom-saiu-nan
-37	*Calanthe discolor* Lindley	Saiu-nancho
-45	*Calanthe discolor Linl. var. bicolor (Lindl.)* Makino	Kun-saiu-nan
-36	*Calanthe reflexa* Max.	Yeorum-saiu-nan
-38	*Calanthe striata R.* Brown	Kum-saiu-nan
-73	*Cardamine koreana* Nakai	Cham-gochu-naingi
-6	*Carex chordorhiza* Ehrh.	Daian-sacho

(continued)

Table 5-3 (continued)

Classification	Scientific Name	Common Name
-51	*Celtis edulis* Nakai	Noran-paeng-namu
-69	*Corydalis grandicalyx* B. Oh et Y. Kim	Galqui-hyon-hosaek
-70	*Corydalis humilis* B. Oh et Y. Kim	Nanjangi-hyon-hosaek
-71	*Corydalis maculata* B. Oh et Y. Kim	Geom-hyon-hosaek
-39	*Cremastra appendiculata* Makino	Yak-nancho
-3	*Crypsinus hastatus (Thunb.)* Copel.	Ko-rancho
-48	*Cymbidium goeringii* Reichb. fil	Bochun-wha
-49	*Cymbidium nipponicum* Makino	Daehung-nan
-40	*Crpripedium japonicum* Thunberg	Kwangnung-yogang-ggot
-89	*Daphne kiusiana* Miq.	Baik-seohyang
-47	*Dendrobium moniliforme (L.)* Sw.	Seokgok
-61	*Desmodium caudatum* Dc.	Doinjang-pul
-93	*Diapensia obovata (Fr. Schm.)* Nakai	Ammai
-9	*Disporum ovale* Ohwi	Kumgang-aegi-nari
-74	*Drosera peltata var. nipponica (Masam)* Ohwi	Ggun-ggun-i-gui-i-gai
-75	*Drosera rotundifolia* Linne	Ggun-ggun-i-jugeok
-2	*Dryopteris crassirhizoma* Nakai	Kwangjung
-90	*Echinopanax horridum (Non Decne)* Kom.	Ddat-durup-namu
-80	*Echinosophora koreensis* Nakai	Gai-neu-sam
-84	*Empetrum nigrum var. japonicum* K. Koch	Siromi
-66	*Epimedium koreanum* Nakai	Samji-guyeop-cho
-83	*Euphorbia fauriei* Lev. et Vnt.	Dumei-dae-guk
-57	*Euryale ferox* Salisb.	Gasi-yeon-ggot
-102	*Forsythia ovata* Nakai	Manri-wha
-103	*Forsythia saxatilis* Nakai	San-gainari
-43	*Galeola septentrionalis* Reichb. fil	Eurum-nancho
-30	*Gastrodia elata* Blume	Chonma
-105	*Gentiana jamesii* Hemsl.	Biro-yongdam

(continued)

Table 5-3 (continued)

Classification	Scientific Name	Common Name
-104	*Gentiana pseudo-aquatica* Kusene-zoff	Whin-gunul-yongdam
-35	*Goodyera schlechtendaliana* Reichb. fil	Sachol-nan
-41	*Habenaria radiata* Spreng.	Haeorabi-nancho
-119	*Hanabusaya asiatica* Nakai	Kumgang-chorong-ggot
-14	*Hemerocallis micrantha* Nakai	Hamyang-wonchuri
-86	*Hibiscus hamabo* Sieb. et Zucc.	Whangkun
-5	*Hydrocharis dubia (Bl.)* Backer	Jara-pul
-26	*Iris dichotoma* Pallas	Daechong-buchai
-29	*Iris odaesanensis* Y. Lee	Norang-munui-but-ggot
-25	*Iris rossii var. album* Y. Lee	Whin-gaski-but-ggot
-27	*Iris setosa* Pallas	Buchai-but-ggot
-28	*Iris uniflora var. carinata*	Naniang-i-but-ggot
-61	*Isopyrum mandshurica* Komarov	Manju-baram-ggot
-67	*Jeffersonia dubia* Benth.	Ggaing-ggaing-i-pul
-78	*Kirengeshoma koreana* Nakai	Nado-sung-ma
-113	*Lathraea japonica* Miq.	Gai-chong-yong
-44	*Lecanorchis japonica* Bl.	Muyop-ran
-65	*Leontice microrhyncha* S. Moore	Han-gre-ryong-pul
-121	*Leontopodium coreanum* Nakai	Somdari
-122	*Ligularia taquetii* Nakai	Getchui
-18	*Lilium callosum* S. et Z.	Ddang-nari
-11	*Lilium cernum* Komarov	Sol-nari
-12	*Lilium hansonii* Leichtl.	Seom-mal-nari
-17	*Lilium tenuifolium* Fisch.	Kun-sol-nari
-118	*Lonicera okamotoana* Ohwi	Whin-dung-goi-bul
-22	*Lycoris aurea* Herbert	Gaisang-sa-wha
-23	*Lycoris koreana* Nakai	Baikyang-ggot
-62	*Megaleranthis saniculifolia* Ohwi	Modemi-pul
-107	*Menyanthes trifoliata* L.	Jorum-na-mul
-94	*Monotropa hypopithys* L.	Gusang-nan-pul

(continued)

Table 5-3 (continued)

Classification	Scientific Name	Common Name
-32	*Neofinetia falcata (Thunb.)* Hu	Pung-nan
-42	*Orchis cyclochila* Max.	Nado-jebi-nan
-114	*Orobanche coerulescens* Steph.	Cho-jong-yong
-112	*Pedicularis manshurica* Max.	Manju-song-i-pul
-110	*Pedicularis verticillata* Linne	Gurum-song-i-pul
-54	*Phytolacca insularis* Nakai	Seom-jari-gong
-52	*Pilea taquetii* Nakai	Cheju-kun-multong-i
-19	*Polygonatum robustum* Nakai	Wang-dul-gul-rai
-21	*Polygonatum stenophyllum* Max.	Chung-chung-dung-gul-rai
-100	*Primula modesta var. fauriae* Takeda	Seol-aeng-cho
-1	*Psilotum nudum (L.)* Griseb	Sol-ip-nan
-58	*Ranunculus kazusensis* Makino	Maiwha-marum
-96	*Rhododendron brachycarpum var. roseum* Koidz	Hong-manbyong-cho
-97	*Rhododendron mucronulatum for. albforum* T. Lee	Whin-jindalrai
-76	*Rodgersia podophylla* A. Gray	Do-ggai-bi-buchai
-50	*Saururus chinensis* Baill	Sam-baik-cho
-126	*Saussurea polylepis* Nakai	Hongdo-seo-deol-chi
-125	*Saussurea seoulensis* Nakai	Bun-chui
-68	*Schizandra nigra* Max.	Huk-o-mija
-109	*Scopolia japonica* Max.	Michi-kwang-i-pul
-111	*Scrophularia takesimensis* Nakai	Seom-hyon-sam
-123	*Senecio koreanus* Kom.	Kukwha-bang-mang-i
-55	*Silene fasciculata* Nakai	Hanla-jang-gu-chai
-24	*Sisyrinchium angustifolium*	Whin-dungsim-but-ggot
-20	*Smilacina bicolor* Nakai	Jaju-som-dai
-4	*Taxus caespitosa* Nakai	Seol-ak-nun-ju-mok
-63	*Thalictrum coreanum* Lev.	Yeon-ip-gguing-ui-dari
-77	*Tiarella polyphylla* D. Don	Heol-dduk-i-pul
-13	*Tofieldia fauriei* Lev. et Vnt.	Hanla-dol-changpo

(continued)

Table 5-3 (continued)

Classification	Scientific Name	Common Name
-99	*Trientalis europaea L. var. artica (Fischer)* Ladeb.	Gisaing-ggot
-10	*Trillium tschonskii* Max.	Kun-yeon-yong-cho
-116	*Utricularia bifida* L.	Ddang-gui-gai
-117	*Utricularia japonica* Makino	Tongbal
-115	*Utricularia racemosa* Wall.	Isak-gui-gai
-34	*Vexillahium yakusimense* (Yamamoto)	Paik-un-nan
-88	*Viola diamantica* Nakai	Kumang-jebi-ggot
-87	*Viola websteri* Hemsl.	Wang-jebi-ggot
-72	*Wasabia koreana* Nakai	Gochu-naing-i
-82	*Zanthoxylum coreanum* Nakai	Wang-cho-pi

* Ministry of Environment Notification No. 93-3 (18 January 1993)

INSTALLATION:	COMPLIANCE CATEGORY: NATURAL RESOURCES MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 6

OTHER ENVIRONMENTAL ISSUES

Korea ECAMP

SECTION 6

OTHER ENVIRONMENTAL ISSUES

A. Applicability of this Section

This section applies to all U.S. Air Force (USAF) installations overseas. Currently, this section contains major subsections that address environmental impacts, environmental noise, the Installation Restoration Program (IRP), the Pollution Prevention Program, and environmental program management in general.

The regulatory requirements in this section are based on the *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), Department of Defense (DOD) regulations, and Air Force Instructions (AFIs) that apply at overseas installations. Management practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and protect the environment.

Environmental Impacts

This topic of this subsection is the AF's Environmental Impact Analysis Process (EIAP). The subsection addresses FGS-ROK and AF standards the goal of which is to ensure that decision makers are presented with sufficient relevant analysis to understand and evaluate the impact on the environment of the actions they approve and that they receive this information at appropriate times in the decision-making process.

Environmental Noise

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

Installation Restoration Program

This subsection contains standards to ensure that cleanup projects at sites contaminated by AF operations are executed to the appropriate point.

Pollution Prevention

The U.S. Environmental Protection Agency (USEPA) has developed a hierarchy of options regarding environmental management. The highest priority in this hierarchy of management methods is source reduction as a means of preventing pollution. Source reduction includes reuse or closed-loop recycling. The hierarchy then proceeds to recycling, treatment, and disposal as management methods of decreasing priority.

The concept of pollution prevention, as defined by the USEPA, is the maximum feasible reduction at the source of all wastes generated. This reduction is accomplished by the judicious use of resources through source reduction, materials substitution, energy efficiency, reuse of input materials during production, and reduced water consumption. Some of the benefits of pollution prevention are:

1. reducing operating costs (materials, waste management and disposal, production, energy, and facility cleanup)
2. reducing risk of liability
3. enhancing public image
4. protecting the environment and public health.

In Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, 30 November 1993, the AF explicitly makes Pollution Prevention one of the four pillars of its Environmental Quality Program. The AF will eliminate pollution from its activities wherever possible. It will reduce the generation of waste and the procurement of environmentally damaging materials to as near zero as feasible through material substitution, process change, and other techniques. It will prevent at the source, to the greatest extent possible, environmentally harmful discharges to the air, land, surface water, and groundwater. If the generation of waste cannot be prevented at the source, spent material and waste will be reused or recycled whenever possible. What cannot be reused or recycled will be disposed of in an environmentally sound manner. Both waste disposal and releases to the environment are permitted only after all other pollution prevention alternatives have been exhausted.

The regulatory requirements in this subsection are based on the AFIs that address pollution prevention. Management Practices (MPs) are derived from USEPA regulations that are not mandatory overseas but are important to the protection of the environment.

Program Management

This subsection contains standards relevant to weapons ranges, the A-106 Pollution Abatement Plan, certain reporting requirements, the installation's Environmental Protection Committee (EPC), standards addressing the management of environment-related data in the Work Information Management System-Environmental Subsystem (WIMS-ES), and deployments of forces to AF installations overseas.

B. DOD Directives/Instructions

Environmental Impacts

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 17 contains procedures for informing decision makers of environmental considerations when authorizing or approving major DOD actions.

- DOD Directive (DODD) 6050.7, *Environmental Effects Abroad of Major Defense Department Actions*, 31 March 1979, also contains EIAP requirements for overseas installations.

Environmental Noise

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 10, contains criteria for controlling environmental noise on installations.

Installation Restoration Program

- None.

Pollution Prevention

- None.

Program Management

- None.

C. U.S. Air Force Documents

Environmental Impacts

- AFI 32-7061, *Environmental Impact Analysis Process,* 24 January 1995, contains requirements that apply to EIAP overseas.

- HQ USAF/CEV Policy Letter, *MAJCOM EPC Coordination of EIAP Documents*, 26 August 1994, requires documentation indicating prior MAJCOM EPC coordination or approval to accompany EIAP documents sent to them for senior staff approval or signature.

Environmental Noise

- AFI 13-212, Volume 1, *Weapons Ranges*, 28 July 1994, requires that installations with air-to-surface weapons ranges address those ranges in plans required by environmental regulations.

- Air Force Instruction (AFI) 13-201, *Air Force Airspace Management,* 1 August 1994, includes practices to decrease disturbances from flight operations.

Installation Restoration Program

- AFI 32-7006, *Environmental Program in Foreign Countries*, 29 April 1994, contains requirements relevant to the cleanup of overseas sites that have been contaminated in the course of AF actions.

- HQ USAF/CEVR Policy Letter, *Installation Restoration Program Decision Documentation,* 19 January 1988, also contains requirements for recordkeeping related to the IRP.

Pollution Prevention

- AFI 32-7080, *Pollution Prevention Program*, 12 May 1994, outlines the requirements for the AF's Pollution Prevention Program. It provides instruction in the areas of planning, use of ozone depleting chemicals (ODCs), hazardous substance management and minimization, solid waste management, nonpoint source pollution, and air pollutant emissions.

- AF Policy Letter, *Air Force Ban on Purchases of ODCs*, 7 January 1993, governs the purchase, use, and management of controlled ODCs. It outlines the ODCs and equipment that use them that cannot be purchased and it outlines the steps that should be taken to replace ODCs currently in use.

- AF Pollution Prevention Strategy, 24 July 1995, details the goals and strategies promoted by the AF for pollution prevention.

Program Management

- AFI 13-212, Volume I, *Weapons Ranges*, 28 July 1994, environmental requirements for bases that operate air-to-surface weapons ranges.

- AFI 32-7001, *Environmental Budgeting*, 9 May 1994, provides guidance on identifying, developing, and processing requirements to meet environmental standards at AF installations.

- AFI 32-7002, *Environmental Information Management System*, 31 May 1994, provides guidance and procedures to standardize the use of WIMS-ES.

- AFI 32-7005, *Environmental Protection Committees*, 25 February 1994, provides guidance on the make-up and responsibilities of the installation's Environmental Protection Committee (EPC).

- AFI 32-7006, *Environmental Program in Foreign Countries*, 29 April 1994, requires installations to cooperate with host nation regulatory authorities. Further, it requires that copies of host nation regulatory authority inspection reports be forwarded to HQ USAF/CE and that receipt or notification of the imminent receipt of findings involving media attention or off-base impacts be reported to specific authorities. It also imposes on installations requirements for planning prior to receiving deployments.

D. Responsibility for Compliance

Environmental Impacts

- The BCE provides support to the Environmental Planning Function (EPF), including managing and getting the technical analyses necessary to support the EIAP.

- The BES provides technical assistance to the EPF concerning environmental quality standards, effects, and monitoring capabilities relating to the action(s) being assessed.

- The Environmental Protection Committee (EPC) reviews and approves or disapproves environmental documents prepared by the EPF during the EIAP.

- The SJA advises the EPF and EPC of legal issues regarding environmental documents.

- The PAO reviews environmental documents for public affairs sufficiency and advises the EPF on issues to be addressed in environmental impact statements (EISs).

- The Proponent Activity is responsible for providing a complete description of the proposed action and alternatives (DOPAA) and for identifying key decision points and assisting in making sure that the EIAP is properly phased so that the relevant environmental documents are available to the decision maker.

Environmental Noise

- The Airspace Manager, under the Deputy Commander for Operations, is responsible for managing special use airspace (SUA) and military training routes (MTRs).

- The Public Affairs Officer (PAO) is responsible for making all public releases of information about AF activities.

- The Range Management Agency is responsible for activities at an air-to-ground range, including planning for the range.

Installation Restoration Program

- The BCE is normally responsible for IRP execution. However, this responsibility may be assigned to the installation's Environmental Management Office if one has been established.

- The BES is responsible for providing technical support in Remedial Investigation/Feasibility Study (RI/FS), risk analysis, Quality Assurance or Quality Control (QA/QC), worker health and safety, and other areas.

- The Staff Judge Advocate (SJA) is responsible for providing legal and negotiation support.

Pollution Prevention

- The Installation Commander (IC) must establish and maintain an active program to survey the use, generation, and disposal of hazardous and radioactive waste. The commander must identify requirements and execute the programs to comply with AF policy.

- The Deputy Commander for Maintenance (DCM) ensures that nonhazardous/nontoxic materials are used where possible, maintains a list of hazardous materials used in the work area by shop and maintenance related task, ensures that personnel are properly trained in ordering, using, handling, controlling, and storing hazardous materials and wastes. DCM is also responsible for ensuring that hazardous waste is properly labeled and for notifying the appropriate headquarters when a nonhazardous substitute can be used. In addition, he/she works with the civil and bioenvironmental engineers to develop the installation's waste management plan.

- The Base Civil Engineer (BCE) is responsible for the maintenance and operation of incinerators, fuel burners (boilers), and all installed petroleum storage and dispensing systems. The BCE is also responsible for the storage and handling of all hazardous materials and fuels used by civil engineering shops. The BCE or designated Environmental Management Office (EMO) develops installation-specific policy for all aspects of hazardous waste and pollution prevention management for all activities on the installation (including AF and non-AF tenants). The BCE/EMO also manages the pollution prevention program and serves as the Office of Primary Responsibility (OPR) for developing and implementing the pollution prevention plan.

- The Bioenvironmental Engineering Services (BES) provides technical expertise on hazardous waste identification and, along with the Environmental Manager and the Environmental Protection Committee, establishes the baseline inventory of the Industrial Toxic Project (ITP) targeted chemicals (see Table 6-1). The BES identifies pollution prevention opportunities based on workplace surveys and recommends substitute processes. The BES reviews all substitutions to ensure that substituted materials do not introduce new hazards.

- The Supply Officer has primary responsibility to receive, store, and issue all items ordered. He/she serves as the equipment approval authority, administers the supply improvement program, provides

technical guidance and assistance on supply matters to agencies across the installation, and serves as the primary stock fund manager.

- The Environmental Protection Committee (EPC) is comprised of representatives from all activities involved in pollution prevention management. It reviews and coordinates the installation commander's pollution prevention management program. The committee reviews summary data on waste generation and personnel exposure. The EPC helps with establishing the baseline inventory of ITP targeted chemicals. It should also adopt a policy recommending against the procurement of hazardous materials containing any USEPA ITP chemicals.

- The Environmental Manager (EM) is responsible for managing the installation hazardous waste (HW) management program. The EM, along with the BES and the EPC, establishes the baseline inventory of ITP chemical quantities. The EM then tracks the issue of these chemicals and sends the information to the MAJCOM.

- Hazardous Waste Generators manage hazardous waste in their custody. Management includes proper storage, inspection, recordkeeping, labeling of containers, and transfer for disposal.

- The Water and Waste Shop within Base Civil Engineering has responsibility for operations and maintenance of treatment plants, pretreatment facilities, pump stations, oil/water separators, and other associated facilities around the installation.

Program Management

A-106 Pollution Abatement Plan

- The BEC is responsible for managing the A-106 program, including updating the current plan, inputting new projects, and coordinating with the Civil Engineering Programmer to ensure projects are included in the Civil Engineering Contract Reporting System (CECORS) or the Programming Design and Construction (PDC) System.

- The Civil Engineering Programmer (CEP) is responsible for getting projects into the CECORS or the PDC system.

- The EPC is responsible for coordinating and approving the A-106 Plan.

WIMS-ES

- The BCE or the Environmental Manager (EM) will coordinate the input of data into WIMS-ES.

Reporting Requirements and Deployments

- AFI 32-7006 does not designate the parties responsible for actions required by these sections.

E. Definitions

- *Affirmative Procurement* - Federal agencies must establish programs to encourage purchase of products containing recycled materials, in particular, USEPA Guideline Items. Affirmative procurement programs must establish preference for products containing recycled material, must include a pro-

motion plan to place emphasis on buying recycled, and must have procedures for obtaining and verifying estimates and certifications of recycled content (AFI 32-7080, Attachment 1, Section C).

- *Alternatives* - ways of reducing adverse effects of hazardous materials (HM). Alternatives, as applied to HM decision making, include, but are not limited to, such possibilities as substituting less hazardous or nonhazardous material; redesigning a component such that HM is not needed in its manufacture, use, or maintenance; modifying processes or procedures; restricting users; consumptive use; on-demand supply; direct ordering; extending shelf life; regenerating spent material; downgrading and reuse of spent material; use of waste as raw material in other manufacturing and combinations of those factors. Alternatives are to be analyzed in a could cost approach, considering what the lowest amount the decision could cost by overcoming barriers to getting the job done, while ensuring protection of human health and the environment (AFI 32-7080, Attachment 1, Section C).

- *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-ROK, Chapter 10, Definitions).

- *Baseline* - quantified starting points from which progress is measured. For the purposes of this instruction, baselines are quantities of material purchased or generated over a specified period of time (AFI 32-7080, Attachment 1, Section C).

- *Categorical Exclusion (CATEX)* - 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 decisions to apply the exclusion (FGS-ROK, Chapter 17, Definitions).

  (NOTE: Attachment 2 to AFI 32-7061 contains an extensive list of actions that are categorically excluded in the absence of unique circumstances.)

- *Characteristic Waste* - a waste that exhibits any of the characteristics listed in 40 Code of Federal Regulations (CFR) 261, Subpart C (i.e., toxicity, corrosiveness, ignitability, reactivity) (AFI 32-7080, Attachment 1, Section C).

- *Cost Factors* - the expense and cost avoidance associated with hazardous materials that may be reduced to monetary terms, which includes future liability. Cost factors refer to direct and indirect costs attributable to hazardous materials that are encountered in operations such as acquisition, manufacture, supply use, supply, use, storage inventory control, treatment, recycling, emission control, training, work place safety, labeling, hazard assessments, engineering controls, personal protective equipment, medical monitoring, regulatory overhead, spill contingency, disposal, remedial action and liability (AFI 32-7080, Attachment 1, Section C).

- *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-ROK, Chapter 10, Definitions).

- *Decibel* (dB) - the unit of sound pressure is the decibel and is 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. The standard reference pressure for 0 dB is 0.00002 Pascals (FGS-ROK, Chapter 10, Definitions).

- *Description of Proposed Action and Alternatives (DOPAA)* - an AF document that is the framework for assessing the environmental impact of a proposal. It describes the purpose and need for the action, the alternatives to be considered, and the rationale used to arrive at the proposed action (AFI 32-7061, Attachment 1).

- *Domestic Noise/Vibration Control Zone* - an area prescribed by the Mayor or Governor where certain noise standards apply to preserve the living environment for residents and to prevent noise pollution (FGS-ROK, Chapter 10, Definitions).

- *Economic Analysis* - an evaluation of the costs associated with the use of hazardous materials and potential alternatives. An economic analysis is not a specific, step-by-step procedure that can be applied by rote to all cases of analyzing whether to use a hazardous material. Rather, organizations shall be guided by basic principles of economics and informed judgment (AFI 32-7080, Attachment 1, Section C).

- *Environment* - the natural and physical environment, excluding social, economic and other environments (FGS-ROK, Chapter 17, Definitions).

- *Environmental Assessment (EA)* - a concise analysis to assist DOD components in determining whether there is a potential for significant environmental impacts associated with the proposed action and whether an environmental impact statement is required (FGS-ROK, Chapter 17, Definitions).

- *Environmental Consideration Report (ECR)* - a record of environmental conditions based on installation records for base realignment and closure (FGS-ROK, 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-ROK, Chapter 17, Definitions).

- *Environmental Manager* - the Base environmental management function supervisor or designated representative. Synonymous with the term Environmental Coordinator (AFI 32-7080, Attachment 1, Section C).

- *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, organizations. Environmental reviews are prepared either unilaterally by DOD or in conjunct with another U.S. Agency but do not include foreign government participation (FGS-ROK, 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-ROK, Chapter 17, Definitions).

- *Environmentally Preferable* - products or services that are less harmful to human health and the environment to use, reuse, operate and maintain, and dispose of in comparison with competing products or services of equal value (AFI 32-7080, Attachment 1, Section C).

- *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-ROK, Chapter 10, Definitions).

- *Facilities Controlling Noise/Vibration* - those facilities defined in Table 6-2 that remove or reduce noise and/or vibration from facilities generating noise/vibration (FGS-ROK, Chapter 10, Definitions).

- *Facilities Generating Noise/Vibration* - those machines, instruments, facilities, and other sources defined in Table 6-3 that generate noise and vibration (FGS-ROK, Chapter 10, Definitions).

- *Federal Action* - an action that is implemented or funded directly by the United States Government. It does not include actions in which the United States participates in an advisory information gathering, representational, or diplomatic 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-ROK, Chapter 17, Definitions).

- *Finding of No Significant Impact (FONSI)* - a decision document that briefly states why an action will not significantly affect the environment, and that an EIS will not be prepared. The FONSI includes a summary of the EA and notes any related environmental documents. If the EA is attached, the FONSI need not repeat any of the EA discussion, but may incorporate it by reference (FGS-ROK, Chapter 17, Definitions).

- *Foreign Nation* - any geographic area (land, water and airspace) that is under the jurisdiction of one or more foreign governments; any area under military occupation by the U.S. 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-ROK, foreign nation includes contiguous zones and exclusive economic zones established consistent with customary international law (FGS-ROK, Chapter 17, Definitions).

- *Global Commons* - geographic areas that are outside the jurisdiction of any nation, and include the oceans outside territorial limits and Antarctica. Global commons do not include contiguous zones and fisheries zones of foreign nations (DODD 6050.7, para C(4)).

- *Hazardous Material Pharmacy* - single point control of hazardous material (AFI 32-7080, Attachment 1, Section C).

- *Hazardous Materials* - any substances or materials that pose a threat to human health or the environment typically due to their toxic, corrosive, ignitable, explosive, or chemically reactive nature. More specific definitions may be found in various Federal regulations that implement statutes (i.e., *Hazardous Material Transportation Act, Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA)) (AFI 32-7080, Attachment 1, Section C).

- *Hazardous Waste* - any waste by-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed; possess at least one of five characteristics (toxic, corrosive, ignitable, explosive, or chemically reactive) or are listed in 40 CFR 261.3 or applicable state or local waste management regulations (AFI 32-7080, Attachment 1, Section C).

- *Hazardous Waste Characterization* - the identification, description, and quantification of a hazardous waste stream (AFI 32-7080, Attachment 1, Section C).

- *Improvement Order* - an order that may be issued by the Minister of Environment (MOE) when noise and/or vibration limits of facilities generating noise and/or vibration violate the permissible noise/vibration standards prescribed in the Korean Noise/Vibration Control Law. This order may direct the respective business to establish, improve, replace or take any other necessary measures on the generation facilities or the prevention facilities within a period prescribed by the Prime Minister Order (FGS-ROK, Chapter 10, Definitions).

- *Level 1 Projects and Services* - in the context of the A-106 Pollution Abatement Plan (AFI 32-7001, para 3.4.2.1.1):
    1. correct conditions out of compliance with the FGS or the *Overseas Environmental Baseline Guidance Document* (OEBGD) if there are no FGS (see AFI 32-7006)
    2. restore contaminated sites posing imminent and substantial endangerment to human health and safety
    3. restore contaminated sites as needed to sustain current operations.

- *Level 2 Projects and Services* - in the context of the A-106 Pollution Abatement Plan, these address (AFI 32-7001, para 3.4.2.2.1):
    1. conditions that will be out of compliance with future requirements of international agreements such as treaties, Status of Forces Agreements (SOFAs), or bilateral agreements
    2. conditions that will be out of compliance with future FGS requirements.

- *Level 3 Projects and Services* - in the context of the A-106 Pollution Abatement Plan, these projects and services enhance the environment beyond current and future FGS requirements. (AFI 32-7001, para 3.4.2.2)

  (NOTE: Do not use U.S. funds to restore contaminated sites beyond that needed to eliminate imminent and substantial endangerment to human health and safety or sustain current operations (unless required by international agreement).)

- *Life Cycle Economic Analysis* - an evaluation of the costs associated with the use of hazardous materials and potential alternatives over the life of the investment or hazardous material. The analysis is not a specific, step-by-step procedure that can be applied by rote to all cases. Analysis shall be guided by basic principles of economics and informed judgement (AFI 32-7080, Attachment 1, Section C).

- *Life Cycle of Hazardous Material* - the period starting when the use or potential use of hazardous material is first encountered and extending as long as the actual material or its after effects, such as a discarded residual in a landfill, have a bearing on cost. In the case of weapon system acquisition, the life cycle starts when the system is first envisioned. Effects of the use of hazardous material on later operations and maintenance are to be considered. This also holds true for a new use of a hazardous material. Where the hazardous material is already in general use, the life cycle starts when the material is first encountered by any organization that must deal with it (AFI 32-7080, Attachment 1, Section C).

- *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 this protocol (FGS-ROK, Chapter 17, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Media* - the term referring to air, land, water, and groundwater (AFI 32-7080, Attachment 1, Section C).

- *Municipal Solid Waste* (MSW) - trash wastes generated by administrative and domestic activities. MSW does not include hazardous wastes (AFI 32-7080, Attachment 1, Section C).

- *Negative Decision* - a record of decision not to prepare environmental analyses (FGS-ROK, Chapter 17, Definitions).

- *Noise* - unwanted or annoying sound caused by the use of machines, instruments, facilities and other sources (FGS-ROK, Chapter 10, Definitions).

- *Noise/Vibration Control Zone* - an area designated by the Mayor/Governor in which it is deemed necessary to prevent noise and/or vibration from special construction works in order to preserve the living environment of the residents of that area (FGS-ROK, Chapter 10, Definitions).

- *Nonpoint or Nonstationary Source (NPS) Pollution* - a diffuse source of pollution that does not discharge through a single point, such as (AFI 32-7080, Attachment 1, Section C):
    1. for water - runoff from construction activities and agricultural, silvicultural, urban areas, and industrial areas including airfield operating areas
    2. for air - aircraft test stands, vehicles, aerospace ground equipment (AGE), and aircraft operations.

- *Opportunity Assessment* - a systematic procedure to identify and assess ways to prevent pollution by reducing or eliminating wastes (AFI 32-7080, Attachment 1, Section C).

- *Ozone Depleting Chemicals (ODCs)* - chlorofluorocarbons, halons, and other substances that deplete the stratospheric ozone layer as classified by the *Clean Air Act* (CAA) Amendment of 1990 (AFI 32-7080, Attachment 1, Section C).

- *Pollution Prevention* - all the actions necessary, to include use of processes, practices, products or management actions that eliminate or reduce undesirable impacts on human health and the environment. These actions are a hierarchy of source reduction, recycling, treatment, and disposal or means source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other natural resources, and the protection of natural resources (AFI 32-7080, Attachment 1, Section C).

- *Proponent* - any office, unit, or activity that proposes to initiate an action (AFI 32-7061, Attachment 1).

- *Record of Consideration (REC)* - a document that concisely describes the proposed action, identifies the proponent, and explains why further environmental analysis and documentation is not required. A REC documents that *National Environmental Policy Act* (NEPA) requirements have been fulfilled or have been adequately assessed in existing pertinent documents. A REC also documents the use of CATEXs that require such records (FGS-ROK, Chapter 17, Definitions).

- *Recycling* - the use, reclamation and reuse of a material. Use/reuse includes return of the recovered waste to the original process or when the waste is substituted for a raw material in another process. Waste reclamation includes processing of residual waste to recover a useful product and generation of waste material (AFI 32-7080, Attachment 1, Section C).

- *Sound Exposure Level* (SEL) - a measure of single noise events such as ground runup or blast noise. 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-ROK, Chapter 10, Definitions).

- *Soundproof Facilities* - those facilities that remove or reduce noise from sources other than facilities generating noise and/or vibration (FGS-ROK, Chapter 10, Definitions).

- *Source Reduction* - any practice that reduces or eliminates any hazardous material, pollutant, or contaminant entering any waste stream or otherwise residual waste generation at the source, usually within the generation process. The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, feedstock substitutions, improvements in feedstock purity, shipping and packaging modifications, improvements in housekeeping, maintenance, training, and management practices, increases in machinery efficiency, and recycling within a process (AFI 32-7080, Attachment 1, Section C).

- *Toxic Chemicals* - those chemicals listed in Section 313 of the *Emergency Planning and Community Right-to-Know Act* (EPCRA) as of 1 December 1993 (AFI 32-7080, Attachment 1, Section C).

- *Transportation* - trains, automobiles, streetcars, roadways, and railroads. Airplanes and ships are excluded from this definition (FGS-ROK, Chapter 10, Definitions).

- *Vibration-Proofing Facilities* - facilities that remove or reduce vibration from the source other than facilities generating noise and/or vibration (FGS-ROK, Chapter 10, Definitions).

- *Volatile Organic Compound (VOC)* - organic substances that react rapidly with NO_x in the air and in the presence of sunlight to form oxidants or smog (AFI 32-7080, Attachment 1, Section C).

OTHER ENVIRONMENTAL ISSUES

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
Environmental Impacts		
All Installations	KO.6-1 through KO.6-7	(1)(2)(3)(4)(14)
Environmental Consideration Reports	KO.6-8	(1)
Environmental Analyses	KO.6-9 through KO.6-23	(1)
Environmental Noise		
All Installations	KO.6-24 through KO.6-35	(1)(3)(4)(5)(6)
Facilities Generating Noise or Vibration	KO.6-36 through KO.6-38	(1)
Motor Vehicles	KO.6-39	(1)
Aircraft Noise	KO.6-40	(1)(5)
IRP	KO.6-41 through KO.6-45	(1)(3)
Pollution Prevention (P2)		
All Installations	KO.6-46 through KO.6-48	(1)(3)(7)
Opportunity Assessments	KO.6-49	(8)(11)
P2 Management Plan	KO.6-50 and KO.6-51	(8)(10)(11)
ODCs	KO.6-52 through KO.6-61	(1)(2)(7)(8)(9)(11)(12)
Hazardous Substances	KO.6-62 through KO.6-65	(1)(7)(8)(9)(11)
Solid Waste	KO.6-66 through KO.6-69	(1)(7)(8)(9)(11)(12)
Program Management		
All Installations	KO.6-70 through KO.6-72	(1)(3)
Weapons Ranges	KO.6-73 and KO.6-74	(1)(3)(13)
A-106	KO.6-75 and KO.6-76	(1)(3)
Reporting Requirements	KO.6-77 through KO.6-79	(1)
EPC	KO.6-80 through KO.6-82	(1)(11)
WIMS-ES	KO.6-83 and KO.6-84	(1)(3)
Deployments	KO.6-85 and KO.6-86	(1)

(a) CONTACT/LOCATION CODE:

(1) BCE (Environmental Planning)
(2) BES (Bioenvironmental Engineering Services)
(3) Base Staff Judge Advocate
(4) PAO (Public Affairs Officer)
(5) Deputy for Operations (Airspace Manager)
(6) Range Operating Agency
(7) Supply Officer
(8) Environmental Manager

(9) Generating Activities (Including Accumulation Point Managers/Operators)
(10) Water and Waste Shop
(11) EPC (Environmental Protection Committee)
(12) Contracting
(13) Natural Resources Manager (or Environmental Coordinator)
(14) Base Safety Officer

OTHER ENVIRONMENTAL ISSUES

Records To Review

Environmental Impacts
- Documentation related to EIAP
- Documentation of finding of no adverse effect (for construction activities)
- Environmental Impact Statements (EISs)
- Environmental Analyses (EAs)

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

Installation Restoration Program
- Documentation related to IRP

Pollution Prevention
- Inventory records
- Supply/distribution procedures
- Opportunity assessments
- Baseline records
- Pollution Prevention Management Plan
- Records of any waste reduction/pollution prevention programs
- Records of resource recovery practices including the sale of materials for the purpose of recycling
- Equipment maintenance and inspection records
- Records of waste recovery equipment (i.e., solvent distillation equipment)
- Plans and procedures applicable to air pollution control
- Air emission inventories

Program Management
- A-106 Pollution Abatement Plan
- Exercise- or contingency-specific environment plans, if any

Physical Features To Inspect

Environmental Impacts
- None

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

Installation Restoration Program
- None

Pollution Prevention
- Shop activities
- Hazardous materials and wastes storage areas
- Fire fighting equipment
- Vehicle maintenance areas/motor pool
- Supply area
- Waste recovery areas
- Reuse facility
- VOC sources
- Recycling area

Program Management
- None

People To Interview

Environmental Impacts
- BCE (Environmental Planning)
- BES (Bioenvironmental Engineering Services)
- Base Staff Judge Advocate
- PAO (Public Affairs Officer)
- Base Safety Officer

Environmental Noise
- BCE (Environmental Planning)
- Deputy for Operations (Airspace Manager)
- PAO (Public Affairs Officer)
- Range Operating Agency

Installation Restoration Program
- BCE (Environmental Planning)
- BES (Bioenvironmental Engineering Services)

Pollution Prevention
- BCE (Base Civil Engineer)
- Supply Officer
- BES (Bioenvironmental Engineering Services)
- Environmental Manager
- Generation Activities (Including Accumulation Point Managers/Operators)
- Water and Waste Shop
- EPC (Environmental Protection Committee)
- Contracting

Program Management
- BCE (Environmental Planning)
- Natural and Cultural Resources Managers (or Environmental Coordinator)

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ENVIRONMENTAL IMPACTS **All Installations**	
KO.6-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.6-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(3) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 32-7061, *The Environmental Impact Analysis Process,* 24 January 1995 - DODD 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*, 31 March 1979 - HQ USAF/CEV Policy Letter, *MAJCOM EPC Coordination of EIAP Documents*, 26 August 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.6-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether new regulations concerning EIAP have been issued since the finalization of the manual. (1)(3) Verify that the installation is in compliance with newly issued regulations.
KO.6-4. Installations must have an EPF (AFI 32-7061, para 1.3.4).	Determine who at the installation participates in the EPF. (1)(3) (NOTE: The EPF is the interdisciplinary staff responsible for the EIAP.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) SJA (Staff Judge Advocate) (4) PAO (Public Affairs Officer) (5) Deputy for Operations (Airspace Manager) (6) Range Operating Agency (7) Supply Officer (8) Environmental Manager (9) Generating Activities (Including Accumulation Point Managers/Operators) (10) Water and Waste Shop (11) EPC (Environmental Protection Committee) (12) Contracting (13) Natural & Cultural Resources Managers (or Environmental Coordinator) (14) Base Safety Officer

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-4. (continued)	Verify that the EPF: - assists the proponent in preparing a DOPAA - evaluates proposed actions and completes Sections II and III of AF Form 813, *Request for Environmental Impact Analysis* subsequent to submissions by the proponent and makes categorical exclusion (CATEX) determinations - identifies and documents, with technical advice from the bioenvironmental engineer and other staff members, environmental quality standards that relate to the action under evaluation - prepares environmental documents, or obtains technical assistance through the AF channels or contract support, and adopts the documents as official AF papers when completed and approved - ensures the EIAP is conducted on base-level plans, including contingency plans for the training, movement, and operation of AF personnel and equipment - prepares Notices of Intent (NOI) to prepare an EIS with assistance from the proponent and the PAO - prepares AF Form 813 and applicable portions of Certificates of Compliance for each military construction (MILCON) project according to AFI 32-1021. (NOTE: Determining whether an action significantly affects the environment entails procedures set up to review AF Form 332 and project documentation such as DD Form 1391/C.) Verify that the EPF responsible official signs the AF Form 813 certification.
KO.6-5. Any office, unit, or activity at any level that initiates AF actions (the proponent) must perform specific functions in the EIAP process (AFI 32-7061, para 1.3.5).	Verify that the proponent of an action does the following: (1)(3) - notifies the EPF of pending actions and completes Section I of AF Form 813, including a DOPAA for submittal to the EPF - identifies key decision points and coordinates with the EPF on EIAP phasing to ensure that environmental documents are available to the decision maker before the final decision is made and activities associated with the proposal are not implemented until the EIAP is complete - integrates the EIAP into the planning stage of a proposed program or action and, with the EPF, determines as early as possible whether to prepare an EIS - presents the DOPAA to the EPC for review and comment - coordinates with the EPF prior to organizing public or interagency meetings that deal with EIAP elements of a proposed action and involve persons or agencies outside the Air Force - assists the EPF and PAO in preparing a draft NOI when a decision is made to prepare an EIS.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-6. The SJA, PAO, BES, and Safety Office must perform specific functions in the EIAP process (AFI 32-7061, para 1.3.7 through 1.3.10).	Verify that the SJA does the following: (3) - advises the command level proponent EPF and EPC on CATEX determination and the legal sufficiency of environmental documents - advises the EPF during the scoping process of issues that should be addressed in EISs and on procedures for the conduct of public hearings - coordinates with AFLSA/JAJT on the appointment of an independent hearing officer - refers matters causing, or likely to cause substantial public controversy or litigation through channels to AFLSA/JACE. Verify that the PAO: (4) - advises the EPF, the EPC, and proponents on public affairs implications of proposed actions and review environmental documents for public affairs issues - advises the EPF during the scoping process of issues that should be addressed in the EIS - prepares, coordinates, and distributes news releases related to the proposal and associated EIAP documents - notifies the media and purchases advertisements when newspapers will not run the notices free of charge. Verify that, as a representative of Medical Services, the bioenvironmental engineer provides technical assistance to the EPF in the areas of environmental health standards, effects, and monitoring capabilities. (2) Verify that the Safety Office provides technical assistance to the EPF to ensure consideration of safety standards and requirements. (14)
KO.6-7. The EPC must help the commander assess, review, and approve EIAP documents (AFI 32-7061, para 1.3.6).	Verify that the EPC helps the commander assess, review, and approve EIAP documents. (1) (NOTE: The HQ USAF/CEV policy letter of 26 August 1994 requires documentation indicating prior MAJCOM EPC coordination or approval to accompany EIAP documents sent to them for senior staff approval or signature. The policy is directed at, but not limited to, Draft and Final EISs, EAs, Records of Decision, Findings of No Practicable Alternative, and FONSIs.)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Environmental Consideration Reports	
KO.6-8. Installation Commanders must prepare and submit an ECR in association with base closures and reduced operations (FGS-ROK, Chapter 17, Criterion 3d).	Determine whether the installation is scheduled for closure, realignment, and/or reduced operations. (1) Verify that the installation commander: - prepares an ECR according to Table 6-4 that describes environmental conditions based on installation records - treats the ECR as a confidential document - submits the ECR to USFK EPO for review, staff coordination, and ultimate disposition.
Environmental Analyses (EAs)	
KO.6-9. A service components that is responsible for a proposal must complete the appropriate EAs (FGS-ROK, Chapter 17, Criterion 3a).	Determine whether the installation has sponsored proposals that require EAs. (1) Verify that the installation has completed the EA appropriate to each such proposal. (NOTE: See Table 6-5 for a summary of which types of actions require which kinds of analysis.)
KO.6-10. If a proponent determines that no EA is required, the installation must document that decision (FGS-ROK, Chapter 17, Criterion 3c and AFI 32-7061, para 5.2.1).	Verify that, if a proponent determines that no environmental analysis is required, a negative decision is completed. (1) (NOTE: The negative decision should be recorded on AF Form 813 or 332, or on the Certificate of Compliance (DD Form 1391/C).) Verify that the installation forwards decisions not to prepare EAs to the appropriate headquarters and to the Executive Agent.

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COMPLIANCE CATEGORY:
OTHER ENVIRONMENTAL ISSUES
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
Environmental Impact Statements	(NOTE: EISs are required for the following types of actions *only*: - major DOD actions that do significant harm to the environment of the global commons - 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 an international agreement that is binding on the United States.)
KO.6-11. Installations in the process of completing an EIS must meet certain requirements while engaged in that process (DODD 6050.7, Encl. 1, para C(2) through C(6)).	Verify that no action is taken that does significant harm or limits the choice of a reasonable alternative until the completion of the documentation process. (1) (NOTE: In the case of an emergency where the actions are taken that do significant harm to the environment, the DOD component concerned must consult with the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics).) (NOTE: Environmental documents may be combined with other documents to reduce duplication. Both the use of collective statements and tiering is acceptable.) (NOTE: If a current and acceptable environmental document already exists for a particular action, regardless of which federal agency prepared it, DODD 6050.7 does not require the preparation of a new document.)
KO.6-12. EISs must be prepared in two stages (DODD 6050.7, Encl. 1, para D(2)).	Verify that the installation prepares both a draft and a final version of its EISs. (1)
KO.6-13. Draft EISs must be sufficiently complete to permit meaningful analysis and comment (DODD 6050.7, Encl. 1, para D(2)).	Verify that the installation's draft EISs are sufficiently complete to permit meaningful analysis and comment. (1)
KO.6-14. Installations must take into account substantive comments received on draft EISs (DODD 6050.7, Encl. 1, para D(3)).	Verify that final EISs consider, either individually or collectively, substantive comments received on draft EISs. (1)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-15. Installations must use supplements to draft or final EISs under certain circumstances (DODD 6050.7, Encl. 1, para D(4)).	Verify that supplements to draft or final EISs are prepared when: (1) - substantial changes to the proposed action are made relative to the environment of the global commons - significant new information or circumstances (relevant to environmental concerns) bears on the proposed action or its environmental effects on the global commons.
KO.6-16. Draft and final EISs must include certain information (DODD 6050.7, Encl. 1, para D(5) and D(6)).	Verify that EISs contain the following: (1) - a section on consideration of the purpose and need for the proposed action - a section on the environmental effects of the proposed action and reasonable alternatives - a section that provides a succinct description of the environment of the global commons affected by the proposed action and reasonable alternatives - a section that analyzes, in comparative form, the environmental effects on the global commons of the proposed action and reasonable alternatives. Verify that the EIS contains clear statements as to why relevant information is missing, whether that information is unavailable or scientifically uncertain.
Environmental Studies and Environmental Reviews	(NOTE: The decision whether a proposed action is one that would significantly affect the environments (potential for significant harm) covered by this section is taken by the EPF.)

KO.6-17. Specific analyses and documentation procedures must be carried out when an installation performs certain types of major DOD actions that do significant harm to the environment of a foreign nation or to a protected global resource (FGS-ROK, Chapter 17, Criteria 3a and 3b and DODD 6050.7, Encl. 2, para B(1) and C(3)(a)).	Verify that the installation performs appropriate analyses and creates documentation for the following types of major Federal actions: (1)
	- those that significantly affect the environment of a foreign nation that is not involved in the action
	- those that are determined to cause significant harm to the environment because they provide to that nation:
	  - a product or involve a physical project that produces a principal product, 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
	  - a physical project that is prohibited or strictly regulated in the United States by Federal law to protect the environment against radioactive substances
	- those that significantly harm natural or ecological resources of global importance designated for protection by the President or, in case of such a resource protected by international agreement binding on the United States, designated for protection by the Secretary of State.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-17. (continued)	(NOTE: Included in the category of "prohibited or strictly regulated" are the following: asbestos, vinyl chloride, acrylonitrile, isocyanates, polychlorinated biphenyls, mercury, beryllium, arsenic, cadmium, and benzene.) Determine whether any of the actions occurring at the installation have been granted a categorical exclusion by the DOD. Verify that either an environmental study or an environmental review was prepared, as appropriate. (NOTE: The following are exempt from these requirements: - actions that the EPF determines do not significantly affect the environment of a foreign nation that is not participating in the action, or that do not cause significant harm to a designated resource of global importance - actions taken by the President - actions taken by or pursuant to the direction of the President or a cabinet officer in the course of armed conflict - actions taken by or pursuant to the direction of the President or a cabinet officer when the national security or national interest is involved - intelligence activities and arms transfers - votes and other actions in international conferences and organizations - actions involving export licenses, export permits, or export approvals, other than those relating to nuclear activities - actions relating to nuclear activities and nuclear material, except actions providing a nuclear production or utilization facility as defined in the *Atomic Energy Act* of 1954, as amended, or a nuclear waste management facility to a foreign nation - disaster and emergency relief action.) (NOTE: Additional exemptions may be granted on a case-by-case basis.) (NOTE: If a current and acceptable environmental document already exists for a particular action, regardless of which federal agency prepared it, DODD 6050.7 does not require the preparation of a new document.)
KO.6-18. Certain information must be recorded in the event that a decision is made not to prepare an ES (DODD 6050.7, Encl. 2, para D(3)).	Verify that, if a negative decision is made, the file is documented with a record of that decision and the names of the decision makers who participated. (1) (NOTE: The negative decision should be recorded on AF Form 813 or 332, or on the Certificate of Compliance (DD Form 1391/C).)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) SJA (Staff Judge Advocate) (4) PAO (Public Affairs Officer) (5) Deputy for Operations (Airspace Manager) (6) Range Operating Agency (7) Supply Officer (8) Environmental Manager (9) Generating Activities (Including Accumulation Point Managers/Operators) (10) Water and Waste Shop (11) EPC (Environmental Protection Committee) (12) Contracting (13) Natural & Cultural Resources Managers (or Environmental Coordinator) (14) Base Safety Officer

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-19. Installations in the process of completing an environmental study (ES) must meet certain requirements while engaged in that process (DODD 6050.7, Encl. 2, para D(3)).	Verify that no action concerning the proposal is taken that would do significant harm to the environment until the study has been completed and the results considered. (1)
KO.6-20. The content of an ES is subject to certain requirements (DODD 6050.7, Encl. 2, para D(4)).	Verify that the environmental study includes the following: (1) - a general review of the affected environment - the predicted effects of the action on the environment - significant know actions taken by governmental entities with respect to the proposed action to protect or improve the environment - if no actions are being taken to protect or enhance the environment, a statement as to whether the decision not to do so was made by the affected foreign government or international organization.
KO.6-21. Certain information must be recorded in the event that a decision is made not to prepare an environmental review (ER) (DODD 6050.7, Encl. 2, para E(3)).	Verify that, if a decision is made not to prepare an ER, a record is made of that decision and its basis. (1) (NOTE: The negative decision should be recorded on AF Form 813 or 332, or on the Certificate of Compliance (DD Form 1391/C).)
KO.6-22. Installations in the process of completing an ER must meet certain requirements while engaged in that process (DODD 6050.7, Encl. 2, para E(3)).	Verify that no action concerning the proposal is taken that would do significant environmental harm until the review has been completed. (1)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) SJA (Staff Judge Advocate) (4) PAO (Public Affairs Officer) (5) Deputy for Operations (Airspace Manager) (6) Range Operating Agency (7) Supply Officer (8) Environmental Manager (9) Generating Activities (Including Accumulation Point Managers/Operators) (10) Water and Waste Shop (11) EPC (Environmental Protection Committee) (12) Contracting (13) Natural & Cultural Resources Managers (or Environmental Coordinator) (14) Base Safety Officer

COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-23. The content of an ER is subject to certain requirements (DODD 6050.7, Encl. 2, para E(4)).	Verify that the environmental review includes the following, to the extent reasonably practical: (1) - a statement of the proposed action including its timetable, physical features, general operating plan, and other similar broad-gauge descriptive factors - identification of the important issues involved - the aspects of the actions taken or to be taken by the AF that ameliorate or minimize the impact on the environment - the actions known to have been taken or to be planned by the government of any participating and affected foreign nations that will affect environmental considerations.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ENVIRONMENTAL NOISE **All Installations**	
KO.6-24. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(5)
KO.6-25. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that the following documents are maintained and kept current at the installation: (1)(3) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 13-201, *Air Force Airspace Management*, 1 August 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.6-26. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning noise emissions have been issued since the finalization of the manual. (1)(3)(5) Verify that the installation is in compliance with newly issued regulations.
KO.6-27. Installations with significant noise sources must develop and maintain a noise contour map (FGS-ROK, Chapter 10, Criteria 3a through 3c).	Determine whether the installation has significant noise sources. (1)(5) Verify that the installation has developed and maintains a noise contour map limited to the installation. Verify that noise contours for significant noise sources are developed using a computerized program from operational data using the Day-Night Average Sound Level (L_{dn}) noise descriptor system. Verify that noise analysis for airfields is developed using the A-weighted L_{dn}. (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 Laboratories (USACERL).)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-27. (continued)	(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.)
KO.6-28. Installations must maintain records of incompatible buildings and land uses (FGS-ROK, Chapter 10, Criterion 3d).	Verify that the installation maintains records of incompatible buildings and land uses on the installation. (1)(5) (NOTE: Table 6-6 establishes compatible uses and the Noise Level Reduction (NLR) to achieve acceptable indoor noise levels for facilities.)
KO.6-29. Installations must review installation master plans to ensure that existing and future facility siting are consistent with an acceptable noise environment (FGS-ROK, Chapter 10, Criterion 3e).	Verify that the installation master plan has been reviewed to ensure that existing and future facility siting is consistent with an acceptable noise environment. (1)(5)
KO.6-30. The siting and conduct of ground runup must be evaluated for low frequency vibration as well as general audible noise (FGS-FGS-ROK, Chapter 10, Criterion 3f).	Verify that the siting and conduct of ground runup are evaluated for both low frequency vibration and general audible noise. (1)(5)
KO.6-31. Installations must maintain operational data on noise producing activities (FGS-FGS-ROK, Chapter 10, Criterion 3h).	Verify that the installation maintains operational data to facilitate development of noise level contour installation compatible use zone studies. (1)(5)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-32. Installations must have procedures to register and resolve noise complaints (FGS-FGS-ROK, Chapter 10, Criterion 3i, AFI 13-201, para 3.2.7).	Verify that a noise complaint procedure has been instituted. (1)(4)(5)(6) Verify that response to complaints are coordinated with PAO. (NOTE: PAOs are responsible for responding to questions regarding DOD aircraft.)
KO.6-33. Installations must take specific actions with regard to noise mitigation (FGS-FGS-ROK, Chapter 10, Criterion 3g).	Verify that the installation identifies noise sources that create noise impacts. (1)(5)(6) Verify that the installation investigates possible mitigation measures. Verify that, if practical, the installation programs resources to reduce noise impacts.
KO.6-34. Installations must limit noise and vibration levels (FGS-ROK, Chapter 10, Criterion 3j).	Verify that the installation complies with the prescribed noise and vibration levels listed in Table 6-7. (1)(2) Verify that, if noise and/or vibration levels are exceeded, the installation establishes self-monitoring.
KO.6-35. Installations that emit noise in noise restriction areas must comply with the standards for living noise (FGS-ROK, Chapter 10, Criterion 3k).	Determine whether the installation is located in a noise restriction area. (1)(2) Verify that the installation complies with the standards for living noise listed in Table 6-8.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Facilities Generating Noise/Vibration	(NOTE: The requirements of this section do not apply to facilities generating noise/vibration whose borders are at least 200 m [≈656 ft] from residential buildings, shopping malls, schools, hospitals, religious buildings, factories, and tourism sites.) (NOTE: The correction factors for permissible noise standards in Table 6-9 may be applied to the measured noise level before comparing with noise standards, provided that the total correction factors applied do not exceed 50 dB(A).) (NOTE: The correction factors for permissible vibration standards in Table 6-10 may be applied to the measured noise level before comparing with noise standards, provided that the total correction factors applied do not exceed 60 dB(A).)
KO.6-36. Facilities controlling noise/vibration must accompany the building or modification of facilities generating noise/vibration (FGS-ROK, Chapter 10, Criterion 3L(1)).	Verify that a facility controlling noise/vibration is built in conjunction with the building or modification of a facility generating noise/vibration. (1) (NOTE: This requirement does not apply to facilities that generate noise/vibration at levels below the permissible standards listed in Table 6-7.) Verify that the facility controlling noise/vibration is designed and executed by a registered individual or company.
KO.6-37. Factories generating noise/vibration must meet applicable noise/vibration standards (FGS-ROK, Chapter 10, Criterion 3L(2)).	Verify that the factory generating noise/vibration complies with the general noise standards listed in Table 6-7 and applicable correction factors listed in Tables 6-9 and 6-10. (1) (NOTE: The installation of facilities controlling noise/vibration is recommended where any facility generating noise/vibration is installed.)
KO.6-38. Installations operating facilities generating noise/vibration must measure and record the noise and/or vibration (FGS-ROK, Chapter 10, Criterion 3n).	Determine whether the installation operates any facilities generating noise/vibration listed in Table 6-3. (1) Verify that the installation measures the noise and/or vibration annually. Verify that the installation maintains records of annual noise/vibration measurements for 3 yr. (NOTE: Facilities that have a facility controlling noise/vibration are exempt from the self-monitoring process.)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Motor Vehicles	
KO.6-39. USFK-owned, nontactical vehicles and privately owned vehicles must meet applicable noise standards for running automobiles (FGS-ROK, Chapter 10, Criterion 3m).	Verify that such vehicles comply with the noise standards for running automobiles listed in Table 6-11. (1)
Aircraft Noise	
KO.6-40. Installations with MTRs, SUA, and/or supersonic areas or routes must meet requirements with regard to keeping the public informed (AFI 13-201, para 3.2.1 through 3.2.6).	Determine whether the installation has MTRs, SUA, and/or supersonic areas or routes. (1)(5) Verify that an explanatory letter has been developed, outlining the purpose, routes, areas, altitudes, intensity, day and time of use of the areas or routes, and locations of existing operating areas or routes in the vicinity. Verify that the PAO distributes the explanatory letter to community news media and local officials. (NOTE: The information needs to be presented not only to those communities in the immediate vicinity of the facility but also to those communities situated under or near SUAs and/or MTRs.) Verify that copies of the explanatory letter have been sent to airport managers at airports within 20 nautical miles (NM) of MTRs, military operating areas, and restricted areas and within 40 NM of supersonic operations. Verify that news releases are prepared for new areas and routes or major modifications to existing ones. Verify that follow-up news releases are prepared for distribution as necessary through PAO channels to appropriate media outlets explaining the status of the areas and routes being used. Verify that procedures are established for answering community and news media inquiries on changes to operational areas or routes.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
INSTALLATION RESTORATION PROGRAM (IRP)	
KO.6-41. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.6-42. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that the following documents are maintained and kept current at the installation: (1)(3) - AFI 32-7006, *Environmental Program in Foreign Countries,* 29 April 1994 - HQ USAF/CEVR Letter, 19 Jan 88, *Installation Restoration Program (IRP) Decision Documentation.* Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.6-43. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether new regulations or policies concerning the cleanup of contaminated sites have been issued since the finalization of the manual. (1)(3) Verify that the installation is in compliance with newly issued regulations.
KO.6-44. Cleanup projects at sites contaminated by AF operations must be executed to a point established by AF policy (AFI 32-7006, para 2.2 and 2.3).	Determine whether the installation has planned or conducted any cleanup projects. (1) Verify that cleanup projects are executed to the point that contamination no longer poses an imminent and substantial danger to human health and safety. Verify that cleanup projects are executed as needed to sustain current operations. (NOTE: These requirements do not apply if the AF is bound by international agreement to do more.)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-45. Installations or facilities identified for return to the host nation must meet specific requirements with regard to documentation (AFI 32-7006, para 2.3.2).	Determine whether the installation or facility has been identified for return to the host nation. (1) Verify that the installation or facility documents all known environmental contamination and provides the documentation to the host nation. (NOTE: This requirement applies only after appropriate U.S.-host public announcement of the return, and only after Major Command (MAJCOM) has granted clearance to release the documentation.)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
POLLUTION PREVENTION **All Installations**	
KO.6-46. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.6-47. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that the following documents are maintained and kept current at the installation: (1)(3) - AFI 32-7080, *Pollution Prevention Program,* 12 May 1994 - AF Policy Letter, *Air Force Ban on Purchases of ODCs*, 7 January 1993. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.6-48. Installations must meet regulatory and AF requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning pollution prevention have been issued since the finalization of the manual. (1)(7) Verify that the installation is in compliance with newly issued regulations.
Opportunity Assessments	
KO.6-49. Installations must conduct Opportunity Assessments to review waste generating activities and installation waste streams (AFI 32-7080, para 2.2.1).	Verify that an Opportunity Assessment of each waste generating activity is conducted on a recurring basis. (8)(11) Verify that the Opportunity Assessment provides a systematic review of the waste generating activities and installation waste streams. Verify that the assessment examines the total waste generation by type and volume of content and determines the most economical and practical waste minimization option. Verify that consideration is given to cost/benefit analysis when evaluating options.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-49. (continued)	(NOTE: An example of the composition of an assessment team includes the following persons: - raw material supplier - Quality Assurance/Quality Control (QA/QC) Officer - consultant - process engineer - safety engineer - purchasing specialist - line laborer - plant manager.)
Pollution Prevention Management Plan	
KO.6-50. Installations must develop and execute a Pollution Prevention Management Plan (AFI 32-7080, para 2.2).	Verify that the installation has a Pollution Prevention Management Plan. (8)(11) Verify that the plan addresses all of the following issues: - the process required to run a pollution prevention program - the program required to fund pollution prevention projects - the road map to achieve AF pollution prevention goals - the actions required to execute the program. Verify that the plan contains management strategies for the following areas: - ODCs - USEPA 17 industrial toxics - hazardous wastes - municipal solid waste - affirmative procurement of recycled materials - energy conservation - air pollution reduction. Verify that the plan identifies and programs projects needed to achieve stated objectives.
KO.6-51. Installations should include additional strategies for improving the pollution prevention program in the Pollution Prevention Management Plan (MP).	Verify that the plan includes the following information: (8)(10)(11) - plans to crossfeed information to the rest of the AF - plans to brief the base EPC - plans to implement Opportunity Assessments - oil/water separator management strategies - usable measures of success - programming and budgeting strategies.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ODCs	(NOTE: See also Section 1, *Air Emissions Management.*) (NOTE: The only Halon 1211 extinguishers classified as mission critical are the 150 lb flight line extinguishers lsited in TO 00-25-172 to support parked aircraft and those hand-held extinguishers on board large frame aircraft.) (NOTE: As of March 1996 no acceptable replacement for Halon 1211 had been identified.)
KO.6-52. Installations must eliminate dependence on ODCs (AF Policy Letter, 7 January 1993).	Determine whether the installation uses any of the substances listed in Table 6-12. (8)(11)(12) Verify that the installation's dependence on chlorofluorocarbons (CFCs), halons, and other substances that deplete the stratospheric ozone layer is being reduced. Verify that any new system or modification to an existing system does not include the use of ODCs as a solvent. (NOTE: This requirement does not apply if the system or modification is approved by the proper waiver approval authority.)
KO.6-53. Installations should have a refrigerant management plan (MP).	Verify that the installation has a plan for managing the use and disposal of refrigerant. (8)
KO.6-54. Installations must follow specific requirements during the period of transition away from ODC dependence (AF Policy Letter, 7 January 1993 and AFI 32-7080, para 3.1.2).	Verify that, when non-ODC substitutes need long research and development lead times, existing uses are converted to ODCs with lower ozone depletion potential as interim substitutes, (i.e., hydrochlorofluorocarbons (HCFCs)). (1)(2)(7)(8) Verify that inventory reserves are used only to aid a transition from ODCs. (NOTE: This requirement applies after production has been outlawed.) (NOTE: Inventory reserves may not be used as a substitute for changing to non-ozone-depleting practices.) Verify that, if reserves are used to extend the service life of ODC dependent equipment, the installation practices conservation, recovery, and reuse.
KO.6-55. Installations must initiate certain ODC replacement programs (AF Policy Letter, 7 January 1993).	Verify that halon systems on crash/rescue vehicles are disabled and a phased program is in place to replace them with nonhalon fire fighting agents. (1)(8) Verify that a phased replacement program has been initiated to replace halon in the 150 lb [≈68 kg] flightline extinguishers.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-55. (continued)	(NOTE: Halon removed from crash/rescue vehicles, or from existing installation stock, may be used to service flightline extinguishers until the phased replacement program is complete.) Verify that existing halon fire extinguishers for facilities are replaced through attrition. Verify that refrigerators and other domestic equipment are replaced at the end of their economic life with non-ODC equipment. (NOTE: Existing airborne cooling systems and subsystems that require ODC refrigerants are considered mission critical.)
KO.6-56. Installations must follow specific requirements regarding contract writing for the use of ODCs (AF Policy Letter, 7 January 1993).	Verify that contracts awarded after 1 June 1993 do not include a requirement to use ODCs or any requirement that can be met only through the use of ODCs. (8)(11) (NOTE: This requirement does not apply if waived by the waiver approval authority (Air Force Logistics (AF/LG), Air Force Civil Engineering (AF/CE), or Deputy Assistant Secretary of the Air Force (SAF/AQ)).)

KO.6-57. Installations must reduce the atmospheric discharge of ODCs (AF Policy Letter, 7 January 1993).	Verify that the discharge of ODCs is reduced to zero as soon as possible. (8)(11)
	
	Verify that one of the following is being used to reduce discharges:
	
	- modification of operating, training, and testing practices
	- implementation of conservation measures such as:
	  - recovery
	  - recycling
	  - reuse
	  - material substitution.
	
	Verify that existing halon systems that discharge to the atmosphere for other than actual fire situations, such as fuel tank inerting systems, are used only in actual combat or in in-flight emergencies.
	
	Verify that fire warning systems and operational procedures operate so that there are no false alarms or false discharges.
	
	Verify that automatic discharge extinguisher systems in facilities are disabled and placed on manual activation.
	
	Verify that all servicing of aircraft halon systems captures the halon for recycling with no atmospheric discharge, other than *de minimis* amounts.
	
	Verify that leaking systems are repaired quickly.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-58. Installations must eliminate purchases of ODCs (AF Policy Letter, 7 January 1993 and AFI 32-7080, paras 3.1.1 and 3.1.3).	Verify that the substances listed in Table 6-13 are no longer being purchased. (8)(11)(12) Verify that the following are no longer purchased: - new or recycled ODCs, unless a waiver has been granted - halon extinguishers for facilities - total flooding systems - facility air conditioning systems, AGE, and other refrigeration and support equipment that use ODCs - commercial vehicles with ODC air conditioning equipment - ODC solvents and the equipment/systems/products that require these solvents for maintenance or operation. (NOTE: ODC needed to meet the mission critical applications will be obtained by using stocks, or from the Defense Logistic Agency (DLA) Defense Reserve, or purchased from commercial sources if the reserve is not able to fill a request.) Verify that ODC-containing products are not purchased or obtained from the Defense Reserve without an approved waiver. (NOTE: Organizations may apply for waivers prior to the award of any contract which requires the use of Class I ODCs to purchase new or recycled ODCs, or obtain ODCs from the DLA Ozone Depleting Chemical Bank for mission critical applications. Waivers are not required for government use of ODCs currently in stock on Air Force facilities.)
KO.6-59. Installations should follow specific procedures for the processing of reclaimed ODCs (MP).	Verify that processes are in place to ensure that reclaimed and excess ODC halons, refrigerants, and solvents are routed to the DLA Defense Reserve. (2)(7)(9)
KO.6-60. Installations must manage halons in existing systems in a specific manner (AF Policy Letter, 7 January 1993).	Verify that halons are removed from aircraft that are being retired from service. (9) Verify that such halons are redeployed or added to the AF account at the DLA Defense Reserve.
KO.6-61. Installations must maintain equipment and inventories at a certain level (AF Policy Letter, 7 January 1993).	Verify that chillers are well maintained and repaired promptly. (1)(9)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Hazardous Substances (Waste and Material)	
KO.6-62. Installations must develop centralized control procedures for the purchase and use of hazardous materials (AFI 32-7080, para 2.4.1).	Verify that the purchase of hazardous materials is under centralized control. (7)(8) (NOTE: This requirement also applies to ODCs.) Verify that the issuance and distribution of hazardous materials is centrally controlled. Verify that hazardous materials are issued in the smallest quantity necessary to meet the customer's need.
KO.6-63. Installations must reduce the use of USEPA ITP chemicals (AFI 32-7080, para 3.2).	Verify that the installation is working to reduce the use of the chemicals listed in Table 6-1. (1)(7)(8) (NOTE: Due to the high levels of certain USEPA 17 Toxics in jet fuel, and the direct link between fuels and flying hours, the AF's USEPA 17 reduction goals exempt jet fuels.)
KO.6-64. Installations must work to minimize hazardous waste generation (AFI 32-7080, para 3.3 and para 2.4.3).	Verify that hazardous waste from industrial, maintenance, and cleanup operations is minimized to the greatest extent practical and economical. (8)(9)(11) Verify that the installation strives to reduce hazardous waste generation at the source. Verify that alternatives to hazardous materials and processes are used whenever possible. Verify that, when technical orders require the use of many hazardous substances or out-of-date technology, the installation submits an Air Force Technical Order (AFTO) Form 22. (NOTE: This requirement applies only if alternative substances/technology are known to exist.)
KO.6-65. Installations should encourage complete use of hazardous materials (MP).	Verify that a reuse facility of some type is established. (7)(8)(11)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Solid Waste **KO.6-66.** Installations must institute pollution prevention procedures as part of their solid waste management (AFI 32-7080, para 3.4.1 and para 3.4.1.1).	Verify that cost-effective waste reduction and recycling programs have been integrated into the Municipal Solid Waste Management program. (1)(9) Verify that the installation either operates a composting program for yard wastes, or participates in a regional composting program. (NOTE: This requirement does not apply if the program can be shown to be cost prohibitive.) Verify that the installation establishes a single qualified recycling program (QRP) that serves all AF and tenant organizations occupying space on the installation, including leased space. Verify that the installation has a QRP manager. Verify that the Services Squadron, AAFES, and the Commissary coordinate their recycling activities with the QRP manager. Verify that recycling includes the following materials: (8) - high quality copier paper - plastic - metals - glass - used oil - lead acid batteries - cardboard - newspaper - tires. Verify that contracts awarded after 20 October 1993 for government owned, contractor operated (GOCO) facilities include provisions that obligate the contractor to participate with a DOD installation or establish their own qualified recycling program. Verify that where economically feasible and to the extent required by law, existing contracts covering GOCO facilities are modified to incorporate these recycling provisions. Verify that the installation conducts an annual opportunity assessment of the solid waste stream to identify source reduction potential and additional recyclable materials.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-67. Installations must issue a municipal solid waste and recycling report quarterly (AFI 32-7080, para 3.4.2).	Verify that the municipal solid waste and recycling report (RCS, HAF-CEV(Q)9424 is released quarterly to the Air Staff within 45 days after the end of each quarter. (8) (NOTE: This report can be discontinued during emergency conditions.)
KO.6-68. Installations must implement affirmative procurement programs for materials with recycled content (AFI 32-7080, para 3.5).	Verify that each activity reviews and revises specifications for the following designated items to allow procurement of products containing recycled materials: (1)(7)(8)(11)(12) - paper - retread tires - building insulation - cement/concrete containing fly ash - re-refined oils. Verify that all of the following elements are included in the installation's affirmative procurement program: - a preference program - a promotion plan - procedures requiring vendors and contractors to estimate and certify the content of recovered materials in the above designated items that they sell to the installation or use in construction projects on the installation - annual review of the effectiveness of the program.
KO.6-69. Installations must issue an affirmative procurement purchases report quarterly (AFI 32-7080, para 3.5.4).	Verify that the affirmative procurement report (RCS, HAF-CEV(Q)9424 is released quarterly to the Air Staff within 45 days after the end of each quarter. (8) (NOTE: This report can be discontinued during emergency conditions.)

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
PROGRAM MANAGEMENT **All Installations**	
KO.6-70. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.6-71. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that following documents are maintained and kept current at the installation: (1)(3) - AFI 13-212, Volume 1, *Weapons Ranges*, 28 July 1994 - AFI 32-7001, *Environmental Budgeting*, 9 May 1994 - AFI 32-7002, *Environmental Management System*, 31 May 1994 - AFI 32-7005, *Environmental Protection Committees*, 25 February 1994 - AFI 32-7006, *Environmental Program in Foreign Countries*, 29 April 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.6-72. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether new regulations concerning the following program management topics have been issued since the finalization of the manual: (1)(3) - weapons ranges - A-106 - reporting requirements - the EPC - WIMS-ES - deployments. Verify that the installation is in compliance with newly issued regulations.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Weapons Ranges **KO.6-73.** Weapons ranges must be addressed in plans required by environmental regulations (AFI 13-212, Volume 1, para 1.10.2.2).	(NOTE: These requirements apply to air-to-surface weapons ranges only.) Determine whether the installation has air-to-surface weapons ranges. (13) Verify that each weapons range is addressed in the plans required by environmental regulations. (NOTE: Examples of such plans are: - the hazardous materials management plan - the hazardous waste management plan - the Spill Prevention, Control, and Countermeasures (SPCC) Plan - the spill contingency plan.)

KO.6-74. Installations must develop a comprehensive weapons range plan that meets specific requirements (AFI 13-212, Volume 1, para 1.10.1.1).	Verify that the installation has a comprehensive weapons range plan. (13)
	
	Verify that the plan addresses:
	
	- land space
	- airspace
	- range facilities
	- targets
	- instrumentation (including scoring devices)
	- environmental items
	- local community and government use of adjacent land (regional development agreements)
	- legal liability
	- base facilities
	- range budget
	- any proposed expansion, construction, rehabilitation, or other action that may have an impact on the range.
	
	(NOTE: For overseas ranges, Major Commands (MAJCOMs) may alter the requirements of this plan as necessary to comply with host nation requirements.)
	
	Verify that a brief narrative is included in the plan for only those items that are impacted.
	
	Verify that the plan contains a statement that all of the following areas have been considered:
	
	- Range:
	  - equipment
	  - targets
	  - structures
	  - land requirements (waivers and exemptions)
	  - airspace requirements

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-74. (continued)	- maintenance and decontamination - Environmental: - fauna and flora - endangered species - emissions - ambient air quality - noise - water resources - wetlands - coastal zones - mineral resources - soil conservation - timber resources - grazing and croplands - hunting and fishing - outdoor recreation - hazardous wastes - historical sites - archaeological sites - range land use - wilderness - flood plains - Community and Government: - off-range land use - regional development - zoning - intergovernmental agreement(s) - encroachment(s) - Legal: - liabilities - environmental laws - ingrants and outgrants - other agreements - Base Facilities - Range Budget: - past - present - future. Verify that, for new weapons ranges, a plan is developed no later than 1 yr after the range has become operational. Verify that the plan is updated at least every 2 yr.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
A-106 Pollution Abatement	(NOTE: See Table 6-14 for additional guidance on determining A-106 compliance.)
KO.6-75. Installations must submit a 5 yr pollution abatement plan (the A-106 report) that details the actions they plan to take to get into or maintain compliance (AFI 32-7001, para 3.8).	Verify that the installation submits a 5-yr pollution abatement plan (the A-106 report) that details the actions they plan to take to get into or maintain compliance. (1)
KO.6-76. The installation's A-106 Plan should meet specific requirements with regard to content (MP).	Verify that the installation A-106 Pollution Abatement Plan reflects environmental requirements and properly prioritizes each as Operation and Services, Level 1, Level 2, or Level 3. (1) Verify that the A-106 Plan includes all projects involving costs that are necessary to comply with environmental standards. Verify that projects resulting from previous Environmental Compliance Assessment and Management Program (ECAMP) evaluations or regulatory inspections are included in the A-106 Plan. (NOTE: Management action plans from ECAMP will give projects required to get installation back in compliance.) Verify that the A-106 Plan includes funds required for studies, management, and monitoring associated with the definition and development of corrective measures and necessary equipment to assure compliance with standards. Verify that the installation budgets for the environmental requirements are recorded in the installation A-106 Plan. (1) (NOTE: Assessors compare listings in the A-106 with the Project by Contract Management System (PCMS) and PDC listings in Civil Engineering and compare official financial records with obligation/expenditure data reflected in the A-106 system.) Verify that funds have been requested for Level 1 projects in the current fiscal year. Verify that design funds have been requested for those projects that will be Level 1 projects in the subsequent fiscal year.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Reporting Requirements	
KO.6-77. Installations must cooperate with host nation regulatory authorities to achieve and maintain environmental quality (AFI 32-7006, para 6.3.5).	Verify that the installation cooperates with host nation regulatory authorities to achieve and maintain environmental quality. (1)
KO.6-78. Installations must promptly forward copies of host nation regulatory authority inspection reports to HQ USAF/CE (AFI 32-7006, para 6.3.5).	Verify that the installation promptly forwards copies of host nation regulatory authority inspection reports to HQ USAF/CE. (1)
KO.6-79. Installations must immediately report receipt or notification of the imminent receipt of findings involving media attention or off-base impacts to certain authorities (AFI 32-7006, para 6.3.5).	Verify that the installation immediately reports receipt or notification of the imminent receipt of findings involving media attention or off-base impacts to the following: (1) - HQ USAF/CE - MAJCOM Surgeon - AFLSA/JACE - HQ USAF/JAI.
Environmental Protection Committee (EPC)	
KO.6-80. Installations must have an EPC that fulfills specific functions (AFI 32-7005, para 4.3).	Verify that the installation has an EPC. (1) Verify that it meets at least quarterly or at the direction of the chairperson. Verify that the EPC reviews and approves environmental impact analysis on proposed actions and forwards to the decision maker. Verify that the EPC reviews environmental policy, resources, and performance and makes recommendations on required changes.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.6-80. (continued)	Verify that the EPC ensures that appropriate training and manpower exist to meet environmental responsibilities.
KO.6-81. The EPC must consist of certain members (AFI 32-7005, para 3.3).	Verify that the membership of the EPC mirrors the membership of the USAF EPC. (1)(11) (NOTE: The membership of the USAF EPC includes: - the Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment (SAF/MII) and the Assistant Vice Chief of Staff (HQ USAF/CVA) cochair the EPC - Assistant Secretary for Acquisition (SAF/AQ) - Assistant Secretary for Budget (SAF/FM) - The General Counsel (SAF/IG) - The Inspector General (SAF/IG) - Office of Legislative Liaison (SAF/LL) - Office of Public Affairs (SAF/PA) - the Civil Engineer (HQ USAF/CE) is the EPC Executive Secretary - Deputy Chief of Staff (DCS) Logistics (HQ USAF/LG) - Director, Programs and Evaluations (HQ USAF/PE) - DCS Plans and Operations (HQ USAF/XO) - Chief of Safety (HQ USAF/SE) - The Judge Advocate General (HQ USAF/JA) - DCS Personnel (HQ USAF/DP) - Services (HW USAF/MW) - DCS Command, Control, Communications and Computers (HQ USAF/SC) - Surgeon General (HQ USAF/SG) - Chief of Air Force Reserves (HQ USAF/RE) - Director, Air National Guard (NGB/CF) - Director, Air Force Base Conversion Agency (AFBC/DR).) Verify that the membership of the EPC also includes representatives from tenant organizations, including DRMO and the Army/Air Force Exchange Services (AAFES).
KO.6-82. The EPC has particular responsibilities with regard to record-keeping (AFI 32-7005, para 5).	Verify that a record of the EPC meetings is prepared within 30 days of the meeting. (1)(11) Verify that the minutes of EPC meetings and related documents are kept for at least 10 yr.

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
WIMS-ES Management	
KO.6-83. Installations must meet specific requirements with regard to the tracking and reporting of certain data (AFI 32-7006, para 6.1).	Verify that the installation tracks and reports data from the following areas using WIMS-ES: (1) - cleanup - compliance with FGS - ECAMP - EIAP - comprehensive planning - pollution prevention - data on host nation regulatory findings.

KO.6-84. Program management reporting should be done in WIMS-ES (AFI 32-7002, paras 3.1, 4.1, 5.1, 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1, 13.1, 14.1, and 15.1).	Verify that quarterly reports are being added and released. (1)
	Verify that programming records are being added for projects and Operations and Services expenses.
	Verify that the following modules are in use:
	- A-106 Module, for reporting planned environmental expenditures and budgeting for the following programs:
	  - restoration
	  - compliance
	  - conservation
	  - pollution prevention
	- Release Reporting Module, for tracking and reporting releases
	- ECAMP Module, for tracking and reporting ECAMP findings and action plans
	- Underground storage tanks (UST) Module, for tracking and monitoring USTs
	- PCB Module, for inventorying all PCB-containing equipment (excluding sealed PCB items and capacitors containing less than 3 lb [≈1 kg] of dielectric fluid)
	- Inspection and Enforcement Module, for tracking host nation regulatory findings
	- Hazardous Waste Module, for tracking and monitoring hazardous waste data
	- Air Management Module, for tracking and monitoring air pollution sources and permits
	- Water and Wastewater Module, for tracking water- and wastewater-related data
	- Cleanup Module, for tracking and reporting information concerning cleanup of contaminated sites
	- Pollution Prevention Module, for reporting data related to the pollution prevention program, including the following:
	  - solid waste disposal
	  - hazardous material purchases
	  - affirmative procurement of recycled products
	  - justification information for funding requirements

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COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.6-84. (continued)	- Conservation Module, for tracking and reporting of the following:
	  - Base Comprehensive Plan status
	  - Installation compatible use zone (ICUZ) status
	  - EIAP actions
	  - Natural and Cultural Resource data.
	
	(NOTE: The Training Tracking Module may be used to track environmental training received by personnel at all levels.)

Deployments	
KO.6-85. Installations must comply with specific instructions for deployments (AFI 32-7006, para 7.1).	Verify that the installation complies with the provisions of AFI 32-7061 (EIAP) for deployments. (1) (NOTE: See checklist items KO.6-5, KO.6-6, and KO.6-10).
KO.6-86. Installations must develop and comply with an exercise- or contingency-specific environmental plan (AFI 32-7006, para 7.1 and 7.3.2).	Verify that the installation develops and complies with an exercise- or contingency-specific environmental plan. (1) Verify that the plan meets the requirements of Joint Chiefs of Staff (JCS) Publication 4-04. Verify the plan specifies environmental responsibilities and policies. Verify that the plan addresses at least the following concerns: - certification of local water sources by medical field units - solid and liquid waste management - hazardous materials management - protection of flora and fauna - archaeological and historical preservation - spill response.

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Table 6-1

USEPA 17 Industrial Toxic Chemicals

(AFI 32-7080, A2.2)

1. Benzene
2. Cadmium and its compounds
3. Carbon Tetrachloride
4. Chloroform
5. Chromium and its compounds
6. Cyanide and its compounds
7. Lead and compounds
8. Mercury and compounds
9. Methylene Chloride
10. Methyl Ethyl Ketone
11. Methyl Isobutyl Ketone
12. Nickel and its compounds
13. Tetrachloroethylene
14. Toluene
15. 1,1,1 - Trichloroethane
16. Trichloroethylene
17. Xylenes

Table 6-2

Facilities Controlling Noise/Vibration
(FGS-ROK Table 10-8)

1. Facilities Reducing Noise/Vibration

a. Facility reducing noise:
- silencer
- noise proofing cover
- noise proofing window and room
- noise proofing surface
- noise proofing wall
- noise proofing tunnel
- noise proofing forest and hill
- noise absorbing equipment and facility
- other facility that is equivalent to or better than those listed above

b. Facility reducing vibration:
- elastic supporter and vibration suppressor
- vibration preventing furrow
- pipe vibration prevention facility
- other facility that is equivalent to or better than those listed above

2. Soundproof Facilities

- silencer
- noise proofing cover
- noise proofing window and room
- noise proofing surface
- noise proofing wall
- noise proofing tunnel
- noise proofing forest and hill
- noise absorbing equipment and facility
- other facility that is equivalent to or better than those listed above

3. Vibration-proofing Facilities

- elastic supporter and vibration suppressor
- vibration preventing furrow
- pipe vibration prevention facility
- other facility that is equivalent to or better than those listed above

Table 6-3

Facilities Generating Noise/Vibration
(FGS-ROK Table 10-7)

1. Facilities Generating Noise

a. Structure, machine, and equipment using motive power (by horse power [hp]):
- compressor with 10 hp or more
- ventilator with 10 hp or more
- cutter with 10 hp or more
- pressure with 10 hp or more
- crusher with 10 hp or more
- transmitter with 30 hp or more
- lathe with 20 hp or more
- flour maker with 20 hp or more
- saw (at lumber mill) with 20 hp or more
- wood processing facility with 20 hp or more
- printing facility with 20 hp or more
- roller with 30 hp or more
- any facility with more than structure, machine, or equipment listed above will be considered a discharge facility if the total horse power in the same category exceeds 50 hp, even if individual horse power does not reach the criteria listed above
- any facility with more than structure, machine, or equipment listed above will be considered a discharge facility if the total horse power in the same category exceeds the criteria listed above

b. Structure, machine, and equipment using motive power (by number):
- 100 or more industrial sewing machines
- cement brick or cement block manufacturing facility with four pressers or vibrators

2. Facilities Generating Vibration

- press with 20 hp or more (oil-pressure driven is excluded)
- crusher with 30 hp or more
- wood processing facility with 30 hp or more
- casting instrument with 50 hp or more
- cement brick or cement block manufacturing facility with four pressers or vibrators

NOTE: kW may be converted to hp by multiplying by 1.3 and rounding decimal digits.

Table 6-4

Environmental Conditions Report
(FGS-ROK Table 17-2)

A-1. This is a record keeping document. Its sole purpose is to provide a documentary record of environmental conditions at any USFK base that is identified for realignment, base closure and/or reduced operations.
A-2. The ECR should be as simple and concise as possible so that the decision maker can fully understand the existing environmental conditions and probable impacts. Nevertheless, the ECR shall be comprehensive and thorough enough so that the higher echelon can be alerted to problem areas. Adequate information shall be included to fully support the conclusions presented.
A-3. The installation/base commander will prepare an ECR that will describe conditions based on installation records and a walk through of the site. No new or additional surveys will be required. The ECR preparation process should include a site survey of unusual odors; stained soils; stressed vegetation; leachate seeps; properties and structures in which it is known that hazardous substances have been stored, released, or disposed of; and so forth. If an Environmental Compliance Assessment and Management Program has been completed at the base/installation, this should be a component of the ECR. Installation Master Plans; annual Drinking Water Surveillance Program reports; asbestos, underground storage tank, polychlorinated biphenyl, and radon surveys; petroleum, oils, and lubricants, and hazardous material/hazardous waste spill reports; installation restoration program project documents; U.S. Army Pacific Environmental Health Engineering Survey reports; and other environmental review reports should also be considered in preparing the ECR. The ECR should be coordinated with command radiation personnel to get their input on radiation contamination or contamination potential at the base/installation.
A-4. The following format is suggested for the ECR: a. Cover sheet; b. Executive summary; c. Table of contents; d. Affected environment and environmental consequences; e. Conclusions and recommendations; f. Signature (affirming that turnover of the installation will not result in environmental impact significant enough to require additional environmental analysis); and g. Appendix or appendices (if any).

Table 6-5

Environmental Effects Abroad

(FGS-ROK 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.	EIS
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.	ER or ES
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.	ER or ES
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.	ER or ES
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.	EIS, ER, or ES
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.

Table 6-6

Minimum Building Sound Level Requirements and Acceptable Land Uses

(FGS-ROK 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	No	No	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/ 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]	Yes
*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[2]	No[2]	No[2]
*Outdoor - Infrequent Speech Communication	No[2,3]	No[2,3]	Yes	Yes	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.

(continued)

Table 6-6 (continued)

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.

Table 6-7

General Noise Standards
(FGS-ROK Table 10-2)

General Areas		Standards (L_{eq} dB(a))	
		Daytime (0600 - 2200)	**Night** (2200 - 0600)
Area	I	50	40
	II	55	45
	III	65	55
	IV	70	65
Road Side	I, II	65	55
	III	70	60
	IV	75	70

* Not applicable to noise from trains and construction activities

NOTES:

Category I includes:

1. Natural Environmental Preservation Areas, tour/recreation areas, and settlement areas prescribed in the Land Use and Management Law
2. Green Belt prescribed in the Presidential Decree for the Urban Planning Law
3. Exclusive residential areas prescribed in the Presidential Decree for the Urban Planning Law
4. Areas within 50 m [175 ft] from the boundary of a hospital prescribed in the Medical Law
5. Areas within 50 m [175 ft] from the boundary of a school prescribed in the Education Law.

Category II includes:

1. All settlement areas other than residential sectors prescribed in the Land Use and Management Law
2. General and semi-residential areas prescribed in the Presidential Decree for the Urban Planning Law.

Category III includes:

1. Commercial areas prescribed in the Urban Planning Law
2. Semi-industrial areas prescribed in the Presidential Decree for the Urban Planning Law.

Category IV includes:

1. General and exclusive industrial areas prescribed in the Presidential Decree for the Urban Planning Law
2. Industrial areas prescribed in the Land Use and Management Law.

Table 6-8

Restriction Standards for Living Noise

(FGS-ROK Table 10-3)

Area	Type of Noise		Morning (0500 - 0800) Evening (1800 - 2200)	Daytime (0800 - 1800)	Night Time (2200 - 0500)
residential, greenbelt, resort, natural environmental preservation area, area inside 50 m [175 ft] radius from the boundary of a school or hospital	noise from a megaphone or loudspeaker	outdoor provision	70 dB(A) or less	80 dB(A) or less	60 dB(A) or less
		indoor provision	50 dB(A) or less	55 dB(A) or less	45 dB(A) or less
	factory and business		50 dB(A) or less	55 dB(A) or less	45 dB(A) or less
	noise from construction site		65 dB(A) or less	70 dB(A) or less	55 dB(A) or less
commercial, industrial, areas other than residential in colony	noise from a megaphone or loudspeaker	outdoor provision	70 dB(A) or less	80 dB(A) or less	60 dB(A) or less
		indoor provision	60 dB(A) or less	65 dB(A) or less	55 dB(A) or less
	noise from construction site		70 dB(A) or less	75 dB(A) or less	55 dB(A) or less

NOTE:

1. The type of area is classified by the Land Use and Management Law. Urban areas are classified according to the Urban Planning Law.

2. If noise is generated less than 2 h/day at daytime at a construction site, the restriction noise standard may allow an extra 10 dB. If construction site noise is generated between 2 h/day and 4 h/day, the restriction noise standard may allow an extra 5 dB.

3. The megaphone or loudspeaker provided for outdoors should be used less than 2 min at a time and have an interval of 15 min or more.

Table 6-9

Correction Factors for Permissible Noise Standards for Facilities Generating Noise

(FGS-ROK Table 10-4)

Category	Description	Correction Factor
Blast	Sudden outburst of sound	+5
Percentage of noise duration to the period concerned[1]	50 percent or more 25 percent or more, but less than 50 percent 12.5 percent or more, but less than 25 percent Less than 12.5 percent	0 -5 -10 -15
By hour	Daytime: 0600 - 1800 Evening: 1800 - 2400 Night time: 2400 - 0600	0 +5 +10
By area[2]	Urban area - exclusive residential area, green area - general residential area, semi-residential area - commercial area, semi-industrial area - general industrial area, exclusive industrial area	 0 -5 -15 -20
	Forest preservation area, natural environment preservation area, tour/recreation area, residential sector in the village area	+20
	Whole sector in the village area except residential sector, aquatic resources preservation area, cultivation area, development promotion area, reserved area, unspecified area	+20
	Industrial area	-20
	Area within 50 m [175 ft] from the border of general hospitals defined by the Medical Law and schools defined by the Education Law	0

[1] Concerned period is 8 h in daytime, 4 h in the evening, and 2 h in the night time.

[2] Area classification is based on the Land Use and management Law; classification of urban areas is based on the Urban Planning Law.

Table 6-10

Correction Factors for Permissible Vibration Standards for Facilities Generating Vibration

(FGS-ROK Table 10-5)

Category	Description	Correction Factor
Percentage of vibration duration to the period concerned[1]	50 percent or more 25 percent or more, but less than 50 percent Less than 25 percent	0 -5 -10
By hour	Daytime: 0600 - 1800 Evening: 1800 - 2400 Night time: 2400 - 0600	0 +5 +5
By area[2]	Urban area - exclusive residential area, green area - general residential area, semi-residential area - commercial area, semi-industrial area - general industrial area, exclusive industrial area	 0 -5 -10 -15
	Forest preservation area, natural environment preservation area, tour/recreation area, residential sector in the village area	0
	Whole sector in the village area except residential sector, aquatic resources preservation area, cultivation area, development promotion area, reserved area, unspecified area	-5
	Industrial area	-15
	Area within 50 m [175 ft] from the border of general hospitals defined by the Medical Law and schools defined by the Education Law	0

[1] Concerned period is 8 h in daytime, 4 h in the evening, and 2 h in the night time.

[2] Area classification is based on the Land Use and Management Law; classification of urban areas is based on the Urban Planning Law.

Table 6-11

Noise Standards for Running Automobiles

(FGS-ROK Table 10-6)

Type of Vehicle	Muffler Noise (dB(A))		Horn Noise (dB(C))
	2 February 1991 - 31 December 1995	after 1 January 1999	after 2 February 1991
Light Duty Automobile	105 or less	100 or less	115 or less
Passenger Automobile	105 or less	100 or less	
Small Freight Automobile	105 or less	100 or less	
Heavy Duty Automobile	110 or less	105 or less	
Motorcycle	115 or less	110 or less	

Types of Automobiles

1. Light Duty Automobiles:
   - -- automobiles for a very small number of passengers or small amount of freight
   - -- engine size (emission): less than 800 cc.
2. Passenger Automobiles:
   - -- ordinary passenger automobiles
   - -- engine size (emission): 800 cc or larger
   - -- weight: less than 3 tons [≈2.72 metric tons].
3. Small Freight Automobiles:
   - -- ordinary freight automobiles
   - -- engine size (emission): 800 cc or larger
   - -- weight: less than 3 tons [≈2.72 metric tons].
4. Heavy Duty Automobiles:
   - -- automobiles for a very large number of passengers or large amount of freight
   - -- weight: 3 tons [≈2.72 metric tons] or larger.
5. Two Wheel Automobiles:
   - -- automobiles with two wheels for one or two passengers
   - -- engine size (emission): 50 cc or larger
   - -- weight: less than 0.5 ton [≈0.45 metric tons].

NOTES:

1. Passenger automobiles include wagons.
2. Small freight automobiles include jeeps, coaches, and vans.
3. The types of special equipment that are included in the heavy duty automobiles will be specified by the Minister of Environment.
4. Two wheel automobiles include two wheel passenger side cars.

Table 6-12

ODCs Subject to AF Policy Letter, 7 January 1993

(AF Policy Letter, 7 January 1993)

HALONS
Halon 1211, Halon 1301, Halon 1202, and Halon 1011 are used primarily as firefighting agents.
CFCs
CFCs -11, -12, -13, -111, -112, -113, -114, -115, -211, -213, -214, -215, -216, and -217 are used primarily as refrigerants and cleaning solvents.
OTHER CONTROLLED SUBSTANCES
Carbon tetrachloride and methyl chloroform are used primarily as cleaning solvents. Methyl bromide is used as pesticide and fumigant.

Table 6-13

Ozone Depleting Chemicals to which AFI 32-7080 Applies

(AFI 32-7080, A2.1)

Halocarbon Number	Molecular Formula	Name
Section A: Class I Ozone Depleting Chemicals		
CFC-11	CCl_3F	Trichlorofluoromethane
CFC-12	CCl_2F_2	Dichlorodifluoromethane
CFC-113	$C_2Cl_3F_3$	Trichlorotrifluoroethane
CFC-114	$C_2Cl_2F_4$	Dichlorotetrafluoroethane
CFC-115	C_2ClF_5	Chloropentafluoroethane
Halon 1211	CF_2ClBr	Bromochlorodifluoromethane
Halon 1301	CF_3Br	Bromotrifluoromethane
Halon 2402	$C_2F_4Br_2$	Dibromotetrafluoroethane
CFC-13	$CClF_3$	Chlorotrifluoromethane
CFC-111	C_2Cl_5F	Pentachlorofluoroethane
CFC-112	$C_2Cl_4F_2$	Tetrachlorodifluoroethane
CFC-211	$C_3Cl_7F_3$	Heptachlorofluoropropane
CFC-212	$C_3Cl_6F_2$	Hexachlorodifluoropropane
CFC-213	$C_3Cl_5F_3$	Pentachlorotrifluoropropane
CFC-214	$C_3Cl_4F_4$	Tetrachlorotetrafluoropropane
CFC-215	$C_3Cl_3F_5$	Trichloropentafluoropane
CFC-216	$C_3Cl_2F_6$	Dichlorohexafluoropropane
CFC-217	C_3ClF_7	Chloroheptafluoropropane
Carbon Tetrachloride	CCl_4	Tetrachloroethane
Methyl Chloroform	$CHCl_3$	Trichloroethane (all isomers)
Methyl Bromide		
Section B: Class II Ozone Depleting Chemicals		
HCFC-12	$CHCl_2F$	Dichloromethane
HCFC-22	$CHClF_2$	Chlorodifluoromethane
CHFC-121	C_2HCl_4F	Tetrachlorofluoroethane
CHFC-122	$C_2HCl_3F_2$	Trichlorodifluoroethane
CHFC-123	$C_2HCl_2F_3$	Dichlorotrifluoroethane
HCFC-124	C_2HClF_4	Chlorotetrafluoroethane
HCFC-131	$C_2H_2Cl_3F$	Trichlorofluoroethane
HCFC-132	$C_2H_2Cl_2F_2$	Dichlorodifluoroethane

(continued)

Table 6-13 (continued)

Halocarbon Number	Molecular Formula	Name
HCFC-133	$C_2H_2ClF_3$	Chlorotrifluoroethane
HCFC-141	$C_2H_3Cl_2F$	Dichlorofluoroethane
HCFC-142	$C_2H_3ClF_2$	Chlorodifluoroethane

Table 6-14

Guidance for A-106 Compliance

Use the following list of questions to aid in determining whether the A-106 package has been completed correctly.

1. Is **MAJCOM** field correct?
2. Is the **BASE** field filled in?
3. Is the **PROJECT** number correct in accordance with CEV A-106 guidance letter?
4. Does the **MODULE IND** read PREV?
5. Is the **TITLE** one of the standard titles included in the call letter?
6. Is the **Nature of the PROJECT** I, E, or O? If it is E. is it fully justified? If it is O is it an O&S project?
7. Is a **BASE POC** and a **PHONE** listed?
8. Is there an N on screen two?
9. Is the **Pgm FY** correct?
10. Does the PA amount match the PPPN?
11. Is the **CWE** entered in? For an initial entry is it the same as the PA amount?
12. Is the **fund type** entered?
13. Is there an N in **Multiple INST**?
14. **PGM Element** for 3400, 3010, or 3020 money should be 78054. For 3600 money it should be 65854.
15. Is **Assessment** left blank?
16. Is the **progress code** only one of the following: (for an initial entry it should be either 1 or 9)
    1 = project validated and funded
    2 = funds have been obligated
    6 = project canceled
    9 = all O&S
17. Is **ownership type** and **statutory auth** filled in?
18. Does **design/plan** have a year and month that the project will be RTA? Does it make sense (i.e., too late in the FY or already past)?

(continued)

Table 6-14 (continued)

19. Is **pollutant category** entered only for O&S projects?

20. **COMPL level** is left blank for O&S. For all other purposes ensure the validated level is entered as follows:
    Level 1 - ESDP
    Level 2 = ESDF
    Level 3 = ESDL

21. **Narrative Screen,** does the narrative match the PPPN and is it complete?

INSTALLATION:	COMPLIANCE CATEGORY: OTHER ENVIRONMENTAL ISSUES Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 7

PESTICIDE MANAGEMENT

Korea ECAMP

SECTION 7

PESTICIDE MANAGEMENT

A. Applicability of this Section

This section applies to any U.S. Air Force (USAF) installation that uses, stores, or handles pesticides. This section integrates the requirements of Department of Defense Directives (DODDs), DOD Instructions (DODIs), and Air Force Instructions (AFIs) into a single document that normally will apply to any installation that handles pesticides.

Much of the guidance for pest management involves operations and maintenance (O&M) procedures. This section combines O&M guidance and compliance matters. It is used to determine the compliance status of operations, facilities, and equipment used to store and apply pest control chemicals. The section addresses the adequacy of facilities and operating procedures, and personnel qualifications.

The regulatory requirements in this section are based on DODIs, DODDs, and AFIs that apply at overseas installations. Management Practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 11, contains criteria regulating the use, storage, and handling of pesticides, herbicides, and defoliants at DOD installations. It does not address the use of these items by individuals acting in an unofficial capacity in a residence or garden.

- DODI 4150.7, *Department of Defense Pest Management Program*, 22 April 1996, sets forth the policy, responsibilities, and procedures for pest management programs. This instruction establishes the DOD policy of maintaining safe, efficient, and environmentally sound integrated pest management programs to prevent or control pests that may adversely affect health, readiness, or military operations, or damage structures, materiel, or property. The *DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides* establishes the requirement that USAF military and civilian pest managers be certified. DODI 4150.7 requires that a component pest management consultant do an onsite consultant review of each installation's pest management program at least every 36 months. An Environmental Compliance Assessment and Management Program (ECAMP) assessment does not preclude such a visit. DODI 4150.7 applies outside the continental United States consistent with applicable international agreements, Status of Forces Agreements, and the FGS issued for the host nation.

- Technical Information Memoranda (TIM) supplement DODI 4150.7. They provide specific criteria and procedures for the operation of a pest management program, but they contain guidance only and are not regulatory in nature. The following TIM are appropriate to have on hand:
  TIM 13 - *Ultra Low Volume Dispersal of Insecticides by Ground Equipment* (March 1985)
  TIM 14 - *Personal Protective Equipment for Pest Management Personnel* (March 1992)
  TIM 15 - *Pesticide Spill Prevention and Management* (June 1992)
  TIM 16 - *Pesticide Fires: Prevention, Control, and Cleanup* (June 1981)

TIM 18 - *Installation Pest Management Program Guide* (February 1987)
TIM 20 - *Pest Management Operations in Medical Treatment Facilities* (October 1989)
TIM 21 - *Pesticide Disposal Guide for Pest Control Shops* (October 1986)
TIM 24 - *Contingency Pest Management Pocket Guide* (September 1991)
TIM 25 - *Devices for Electrocution of Flying Insects* (August 1988)
TIM 26 - *Lyme Disease - Vector Surveillance and Control* (March 1990)
TIM 27 - *Stored Products Pest Monitoring Techniques* (June 1992)
TIM 29 - *Integrated Pest Management In and Around Buildings* (July 1994).

- Military Handbook 1028-8A, *Design of Pest Management Facilities*, 1 November 1991, includes basic criteria for planning and designing military pest control facilities.

- DOD 4145.19-R-1, *Storage and Materials Handling*, September 1979. Chapter 5, Section 4 of this regulation provides overall guidance for storage and handling of various hazardous commodities at AF installations.

C. U.S. Air Force Documents

- AFI 32-1053, *Pest Management Program*, 18 May 1994, provides guidance for pest management at AF installations. It updates, clarifies, and streamlines previous guidance on the subject and more fully emphasizes environmental impact.

D. Responsibility For Compliance

- Base Civil Engineering (BCE): assures that pest management facilities comply with all applicable USAF and DOD regulations and standards; submits annual reports; and assumes responsibility for the completion of daily records, inspections, requests for additional support, biennial physical examinations, notifications to Public Health (PH), protection of the health and safety of pest management personnel, and required training and certification/recertification of pesticide applicators. The Installation Pest Control Supervisor (i.e., pest management coordinator) within BCE is the principal individual charged with proper pesticide management at AF installations.

- Public Health (PH): determines the type, source, and prevalence of vectors and medical nuisance pests that affect the health and efficiency of personnel; recommends preventive and control measures and monitors the effectiveness of BCE pest management efforts; schedules occupational physical examinations for all BCE and golf course personnel who apply pesticides; provides Hazard Communication training to pest management personnel.

- Bioenvironmental Engineering Services (BES): sets local standards for obtaining and using personal protective equipment (PPE) for pest management personnel and trains all pest management personnel in testing the fit of respiratory protection equipment.

E. Definitions

- *Certified Pesticide Applicators* - personnel who apply restricted-use pesticides or supervise the use of restricted-use pesticides and who have been authorized to do so by successfully completing a training program required by the DOD Pest Management Board, followed by formal certification (FGS-ROK, Chapter 11, Definitions).

- *Direct Supervision* - supervision that includes being at the specific location where pest management work is conducted; providing instruction and control; and maintaining a line-of-sight view of the work performed. Certain circumstances may temporarily remove the line-of-sight view of the application of pesticide from the supervisor such as topographic constraints, vegetation constraints, or building structural constraints. Under these temporary circumstances, the supervisor shall be responsible for the actions of the pesticide applicators (DODI 4150.7, Enclosure 2).

- *Disease Vector* - any animal capable of transmitting the causative agent of a human disease; serving as an intermediate or reservoir host of a pathogenic organism; or producing human discomfort or injury, including (but not limited to) mosquitoes, flies, other insects, ticks, mites, snails, and rodents. It is recognized that certain disease vectors are predominately economic pests that as conditions change may require management or control as a disease vector (DODI 4150.7, Enclosure 2).

- *DOD-Certified Pesticide Applicator* - DOD military or civilian personnel certified in accordance with the *DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides* (DODI 4150.7, Enclosure 2).

- *Hazardous Waste Profile Sheet* - 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-ROK, Chapter 6, Definitions).

- *Installation Pesticide Applicator* - DOD employees or contract personnel whose job responsibilities involve the application of pesticides on DOD installations and property (DODI 4150.7, Enclosure 2).

- *Integrated Pest Management* - the use of all available pest management practices to prevent and suppress pest infestation/population in an environmentally sound manner (FGS-ROK, Chapter 11, Definitions).

  For the purposes of DODI 4150.7, a planned program, incorporating continuous monitoring, education, recordkeeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materiel, or the environment. IPM uses targeted, sustainable (effective, economical, environmentally sound methods, including education, habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and where necessary, the judicious use of least-hazardous pesticides (DODI 4150.7, Enclosure 2).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *On-Site Supervision* - supervision that includes being physically located on the installation, but not necessarily at the specific worksite, during the work performance and being able to be contacted and at the worksite within 30 min (DODI 4150.7, Enclosure 2).

- *Personal Relief* - pest management control efforts made by DOD personnel or their family members at their own expense for control of pests consistent with DOD and component pest management policy (DODI 4150.7, Enclosure 2).

- *Pest* - arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, 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-ROK, Chapter 11, Definitions).

  (NOTE: The term 'pest' is defined by AFI 32-1053, para 1.2.2, as a plant or animal out of place.)

- *Pest Management* - the effective, economical, and environmentally sound prevention or control of animal pests and vectors, undesirable terrestrial and aquatic plants, and plant diseases. It includes such methods as education; inspection (surveys); sanitation and proper waste management (such as use of pressure washing and self-closing compactors); proper storage of food and other pest-susceptible items; exclusion, trapping, and other mechanical or physical means of containing pests (such as using portable vacuum cleaners); pest-preventive building construction and maintenance (caulking); biological control; minimal use of pesticidal chemicals in a manner (such as containerized baits and crack and crevice application) that causes the least harm to the environment (AFI 32-1053, para 1.2.1).

  For DODI 4150.7, the prevention and control of disease vectors and pests that may adversely affect the DOD mission or military operations; the health and well-being of people; or structures, materiel, or property (DODI 4150.7, Enclosure 2).

- *Pest Management Consultant* - professional DOD pest management personnel located at component Headquarters, field operating agencies, major commands, facilities engineering filed divisions or activities, or area support activities who provide technical and management guidance for the conduct of installation pest management operations. Some pest management consultants may be designated by their component as certifying officials (DODI 4150.7, Enclosure 2).

- *Pest Management Coordinator* - the individual officially designated by the Installation Commander (IC) to coordinate and oversee the installation pest management program and installation pest management plan. Pest management coordinators shall be certified as pesticide applicators if their job responsibilities require them to apply or supervise the use of pesticides (DODI 4150.7, Enclosure 2).

  (NOTE: This term is understood to be synonymous with 'installation pest control supervisor,' a term which is used in AFI 32-1053 but not defined there.)

- *Pest Management Personnel* - personnel involved with professional activities that monitor or mitigate pest problems, including personnel that carry out a pest management program, carry out pest control work (which includes selecting, mixing, or applying pesticides), monitor pest populations, 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-ROK, Chapter 11, Definitions).

- *Pest Management Plan* - a long-range, comprehensive installation planning and operational document that establishes the strategy and methods for conducting a safe, effective, and environmentally sound IPM program. Written pest management plans are required as a means of establishing a implementing an installation pest management program (DODI 4150.7, Enclosure 2).

- *Pesticide* - any registered substance or mixture of substances used to destroy pests, control their activity, or prevent them from causing damage (FGS-ROK, Chapter 11, Definitions).

- *Pesticide Applicator* - any individual who applies pesticides or supervises the use of pesticides by others (DODI 4150.7, Enclosure 2). See also *Certified Pesticide Applicator, DOD-Certified Pesticide Applicator, Installation Pesticide Applicator,* and *Uncertified Installation Pesticide Applicator.*

- *Pesticide Handling* - operations involving contact or potential contact with pesticides, including loading, unloading, transferring, storing, mixing and applying pesticides, filling or cleaning pest management equipment, preparing pesticide waste for disposal, and pesticide spill response (FGS-ROK, Chapter 11, Definitions).

- *Pesticide Waste* - materials that are subject to be disposed of in accordance with pesticide disposal restrictions: (FGS-ROK, 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. spilled pesticides and contaminated spill cleanup material
  3. any containers, equipment, or material that are contaminated with pesticides; empty pesticide containers that have been triple rinsed, punched, and crushed are not considered hazardous waste but are normal solid waste.

- *Professional Pest Management Personnel* - DOD military officers commissioned in the Medical Service or Biomedical Sciences Corps or DOD civilian personnel with college degrees in biological or agricultural sciences who are in a current assignment that includes pest management responsibilities exercised regularly. DOD civilian employees also shall meet Office of Personnel Management qualification standards. Based on assignment, some professional pest management personnel are pest management consultants (DODI 4150.7, Enclosure 2).

- *Restricted-Use Pesticide* - (also *Restricted Pesticide*) a pesticide that the USEPA or ROK regulatory agency has determined to have potential for causing unreasonable adverse effects on health and the environment when applied by uncertified pest management personnel (FGS-ROK, Chapter 11, Definitions).

- *Standard Pesticides and Pest Control Equipment* - pesticides and pest control equipment, standardized, purchased, and stocked as items proven best for use at USFK military installations (FGS-ROK, Chapter 11, Definitions).

- *Uncertified Pesticide Applicator* - DOD employees who are not certified under the DOD plan during an apprenticeship period not exceeding two years and who must apply pesticides under the supervision of a DOD-certified applicator (DODI 4150.7, Enclosure 2).

- *Vector* - an arthropod or other organism that transmits a disease agent to another organism (AFI 32-1053, para 1.2.3).

PESTICIDE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.7-1 through KO.7-13	(1)(2)(3)(4)(5)(7)(8)
Pesticide Application	KO.7-14 through KO.7-35	(1)(2)(3)(4)(5)
Documentation and Notification	KO.7-36 through KO.7-39	(3)(4)(5)(6)
Pest Management Facilities	KO.7-40 through KO.7-567	(1)(4)(5)
Storing, Mixing, and Preparation of Pesticides	KO.7-57 through KO.7-69	(1)(2)(4)(5)
Highly and Moderately Toxic Pesticides	KO.7-70 through KO.7-75	(1)(3)(4)(5)(6)
Disposal	KO.7-76 through KO.7-79	(1)(2)(4)(5)

(a) CONTACT/LOCATION CODE:

(1) BCE (Base Civil Engineering)
(2) BES (Bioenvironmental Engineering Services)
(3) BMS (Base Medical Service)/EHO (Environmental Health Office)
(4) Pest Management Shop
(5) Golf Course Maintenance
(6) Base Fire Department
(7) Base Contracting Officer
(8) Base Staff Judge Advocate

PESTICIDE MANAGEMENT

Records To Review

- Records of pesticides purchased by the facility (purchase orders, inventory)
- Pesticide application records
- Description of the facility's pest control program
- Certificates of applicators of restricted-use pesticides
- Facility applicator certification and training program
- Pesticide disposal manifests
- Installation Spill Contingency Plan (ISCP)
- Inventory of stored pesticides
- Copy of notification letter to local emergency officials of pesticides stored onsite
- Pest Management Plan

Physical Features To Inspect

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

People To Interview

- BCE (Base Civil Engineering)
- BES (Bioenvironmental Engineering Services)
- BMS (Base Medical Service)/EHO (Environmental Health Office)
- Pest Management Shop
- Golf Course Maintenance
- Base Fire Department
- Base Contracting Officer
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ALL INSTALLATIONS	
KO.7-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.7-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(8) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - DODD 4150.7, *DOD Pest Management Program*, 22 April 1996 - AFI 32-1053, *Pest Management Program*, 18 May 1994 - TIM 13 - *Ultra Low Volume Dispersal of Insecticides by Ground Equipment* (March 1985) - TIM 14 - *Personal Protective Equipment for Pest Management Personnel* (March 1992) - TIM 15 - *Pesticide Spill Prevention and Management* (June 1992) - TIM 16 - *Pesticide Fires: Prevention, Control, and Cleanup* (June 1981) - TIM 18 - *Installation Pest Management Program Guide* (February 1987) - TIM 20 - *Pest Management Operations in Medical Treatment Facilities* (October 1989) - TIM 21 - *Pesticide Disposal Guide for Pest Control Shops* (October 1986) - TIM 24 - *Contingency Pest Management Pocket Guide* (September 1991) - TIM 25 - *Devices for Electrocution of Flying Insects* (August 1988) - TIM 26 - *Lyme Disease - Vector Surveillance and Control* (March 1990) - TIM 27 - *Stored Products Pest Monitoring Techniques* (June 1992) - TIM 29 - *Integrated Pest Management In and Around Buildings* (July 1994) - Military Handbook 1028-8A, *Design of Pest Management Facilities* (1 Nov 1991). Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.7-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning pesticides have been issued since the finalization of the manual. (1)(2)(8) Verify that the installation is in compliance with newly issued regulations.

(1) BCE (Base Civil Engineering) (2) BES (Bioenvironmental Engineering Services) (3) BMS (Base Medical Service)/EHO (Environmental Health Office) (4) Pest Management Shop (5) Golf Course Maintenance (6) Base Fire Department (7) Base Contracting Officer (8) Base Staff Judge Advocate

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-4. Each installation must have a comprehensive pest management plan (FGS-ROK, Chapter 11, Criterion 3a and DODI 4150.7, E.3.v(1)).	Verify that the installation implements and maintains a written pest management plan. (1)(2)(4)

KO.7-5. Installation pest management plans must meet specific content requirements (FGS-ROK, Chapter 11, Criterion 3a and DODI 4150.7, Encl. 4, para 4b).	Verify that the plan includes the following as a minimum: (1)(2)(4)
	- pest management resources, including:
	  - personnel
	  - equipment
	  - vehicles
	  - materials
	- pest management requirements:
	  - maximum use of integrated pest management procedures for reducing dependence on pesticides
	  - specific pest management requirements
	  - major pest management workload and man-hour requirements
	- self-help pest control programs
	- pest management training requirements
	- pesticide safety and medical surveillance
	- environmental considerations
	- recording and reporting requirements
	- reference library maintenance.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.7-5. (continued)	Verify that the plan is a comprehensive, long-range, narrative document that:
	
	- describes all installation and satellite installation pest management requirements and programs, including those for contracts, natural resources, golf courses, and out leases, and identifies minimum pest management staffing requirements
	- describes all IPM procedures required to monitor and control pests on the installation
	- describes all IPM procedures for surveillance and control of disease vectors
	- identifies all resources, such as work years, facilities, and equipment, required to support the installation pest management program
	- identifies all pesticides (including USEPA registration numbers) approved by the component pest management consultant for use in the installation pest management program
	- describes all health and safety measures that will be taken to protect both pest management personnel and the general public from pesticide exposure and risk
	- describes pest management functions that can be done more economically through commercial contracts and provides, or references, cost comparison analysis
	- describes any pest management operation with special environmental considerations such as those that:
	  - use a restricted-use pesticide
	  - use any pesticide application that may contaminate surface or ground water
	  - include 259 or more contiguous hectares (640 acres) in one pesticide operation
	  - may adversely affect endangered or other protected species and their habitat
	  - involve aerial application of pesticides
	  - involve permits for the use of experimental-use pesticides
	- identifies animal control efforts for feral cats, feral dogs, or wildlife
	- identifies active or potential vector-borne diseases and describe medical department collaboration with host nation agencies for vector surveillance and control matters
	- identifies golf course pest management operations.

KO.7-6. Installations must meet additional requirements with regard to pest management plans (DODI 4150.7, Encl. 4, paras 2, 8d, and 8h, and AFI 32-1053, para 2.4).	Verify that the plan is reviewed and updated annually by qualified personnel. (1)(2)(3)(4) Verify that the pest management coordinator formally coordinates appropriate portions of the plan with the senior medical officer, environmental coordinator, and senior engineering officer and that these individual sign the cover sheet of the plan. Verify that appropriate portions of the plan are reviewed by the Natural Resources Program Manager for consistency with the National Resources Management Plan.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-6. (continued)	Verify that the plan was forwarded to the cognizant component pest management consultant for review, technical approval, and signature on the cover sheet. Verify that the plan has been signed and approved by the IC. Verify that the plan lists all program objectives, arranged in order of priority, according to potential or actual impact on health, morale, structures, materiel, or property. Verify that the plan specifically addresses the surveillance and control of insects and other arthropods in child care and food service facilities. Verify that the plan clearly delineates the responsibilities for surveillance and control of medically important insects and other arthropods. (NOTE: A suggested format for the plan appears in Enclosure 8 of DODI 4150.7.)
KO.7-7. The installation's pest management coordinator must meet specific requirements (DODI 4150.7, Encl. 4, paras 5a and 2a(3)).	Verify that the installation's pest management coordinator has an appropriate position and educational background and has the management skills necessary to implement the installation's pest management plan. (4)(5) Verify that the pest management coordinator is DOD-certified.
KO.7-8. Installations must meet specified measures of merit in the pest management program (DODI 4150.7, Encl. 3).	Verify that the installation meets the following measures of merit: (1)(4)(5)(7) - Measure of Merit 1: by the end of FY97 the installation has a pest management plan that is prepared, reviewed, and updated annually by pest management professionals - Measure of Merit 2: by the end of FY 2000, the amount of pesticides applied annually on DOD installations is reduced by 50 percent from the FY 93 baseline in pounds of active ingredients (NOTE: The goal for this measure of merit must not be obtained by substituting more toxic pesticides that have lower application rates than the pesticide in use.) - Measure of Merit 3: by the end of FY 98, 100 percent of installation pesticide applicators are properly certified. (NOTE: Direct hire employees have a maximum of 2 yr to become certified after initial employment, contract employees need appropriate certification when the contract is let.)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-9. Installations must notify component pest management consultants whenever host nation regulators ask to inspect pest management operations (DODI 4150.7, Encl. 4, para 4c(2)).	Verify that the installation notifies the component pest management consultant whenever host nation regulators ask to inspect pest management operations. (1)(4)(5)
KO.7-10. Installations must not construct buildings that have heating, ventilation, or air-conditioning (HVAC) ducts located below the floor (DODI 4150.7, Encl. 4, para 4c(2)).	Verify that buildings are not constructed with HVAC ducts located in and below the floor. (1) (NOTE: This prohibition is intended to prevent accidental contamination of the ducts with termiticides.) (NOTE: Postconstruction treatment of structures with HVAC ducts is prohibited without a waiver from the component pest management consultant.)
KO.7-11. Self-help programs must be managed in accordance with specific standards (DODI 4150.7, para. E.3.v.(3) and Encl. 4, para 8i(3)).	Verify that self-help programs are established for military housing when cost effective and when IPM monitoring indicates the need for a self-help program. (1)(4) Verify that liquid pesticides are not issued. (NOTE: Self-help pest management materials issued may include cockroach and ant baits and/or traps, mouse traps, glue boards, and general use pesticide aerosols with crack and crevice devices as recommended by the component pest management consultant.) Verify that self-help personnel provide written instructions and appropriate precautions beyond those on pesticide labels to military quarters' and housing occupants. Verify that, if a pesticide is issued to an occupant, records are maintained.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-12. Pest management and disease vector control during military contingency operations, readiness training exercises, and deployments must meet specific standards (DODI 4150.7, Encl. 4, para 9).	Verify that pesticides are applied consistent with the policies and procedures described in DODI 4150.7 during military contingency operations, readiness training exercises, and deployments. (1)(4) Verify that individuals who apply pesticides in these situations are certified in accordance with the *DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides* or are under the direct or on-site supervision of a certified individual. (NOTE: Shipboard independent duty technicians and other military personnel who have received special training for limited site application of preselected pesticides during military operations or deployments are exempt from the certification requirement, but they must be fully trained.)
KO.7-13. Pest management consultants must provide the guidance needed to protect all closing or closed facilities from pests from the beginning of deactivation until property disposal (DODI 4150.7, Encl. 4, para 8j).	Verify that pest management consultants provide the guidance needed to protect all closing or closed facilities from pests from the beginning of deactivation until property disposal. (1)(4)
PESTICIDE APPLICATION	
KO.7-14. Installations must use standard pesticides and pest control equipment only (FGS-ROK, Chapter 11, Criterion 3d).	Verify that the installation uses only standard pesticides and standard pest control equipment that are either: (4)(5) - approved for stocking by the Armed Forces Pest Management Board (AFPMB) - approved in writing by the cognizant USFK pest management authority.
KO.7-15. Certain information must be included on ordering documents in order to make sure that no one buys or issues nonapproved pesticides (AFI 32-1053, para 3.5.3.).	Verify that advice code 2B is used on ordering documents to tell Supply that it may not substitute another product for the requested item. (4)(5)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-16. Installations must follow specific restrictions when ordering pesticides and application equipment (AFI 32-1053, para 3.5.2.).	Verify that standard pesticide application equipment is ordered from Federal supply catalogues. (4)(5) Verify that only pesticides from the Federal listings approved by the AFPMB and the preapproved WIMS Air Force master inventory are used. Verify that the installation has sought and received MAJCOM approval before ordering or using nonstandard, locally purchased pesticides or application equipment.
KO.7-17. Installations must use the least toxic but effective product in their pest management efforts (OEBGD, Chapter 11, Criterion 1).	Verify that, where the use of pesticides is warranted, the installation uses the least toxic but effective product. (4)(5) (NOTE: This requirement was left out of FGS-ROK.)
KO.7-18. Paint containing insecticides is prohibited from use on DOD property (DODI 4150.7, Encl. 4, para 6f).	Verify that neither interior nor exterior paint that contains pesticides is used on the installation. (1)(4)(5) (NOTE: This prohibition also applies to insecticides formulated and labelled for use as paint additives.) (NOTE: Paints containing fungicides as mildew inhibitors may be used when the application directions specify no special restrictions due to the fungicide. Approved marine antifouling compounds or coatings may be applied to protect the surfaces of watercraft.)
KO.7-19. The use of regularly scheduled, periodic pesticide applications and of preventative pesticide treatments is prohibited, (DODI 4150.7, Encl. 4, para 6g).	Verify that the installation does not perform regularly scheduled, periodic pesticide applications. (4)(5) (NOTE: This prohibition does not apply in situations where the installation pest management plan clearly documents that no other technology or approach is available to protect personnel or property of high value.) Verify that preventative pesticide treatments are not used unless the component pest management consultant has given approval based on current surveillance information or records documenting past disease vectors or pest problems that require this approach.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-20. Installations must use recyclable and refillable pesticide containers and closed pesticide mixing and transfer systems as much as possible (AFI 32-1053, para 2.4.11.).	Verify that the installation uses recyclable and refillable pesticide containers and closed pesticide mixing and transfer systems as much as possible. (4)(5)
KO.7-21. Pest management personnel must use all pesticides according to label directions and use equipment according to the manufacturer's instructions (AFI 32-1053, para 3.5.4.).	Verify that pest management personnel use all pesticides according to label directions and use equipment according to the manufacturer's instructions. (4)(5)
KO.7-22. Pesticide applicators must meet certification requirements (FGS-ROK, Chapter 11, Criterion 3b; DODI 4150.7, para E.3.v(4) and Encl. 4, para 5b; and AFI 32-1053, para 2.4.3).	Verify that pest management personnel are certified in accordance with DODD 4150.7-M, the *DOD Plan for Certification of Pesticide Applicators of Restricted-Use Pesticides.* (4)(5) Verify that personnel who are undergoing apprenticeship training, but are not yet certified, apply pesticides only under the direct supervision of a certified pesticide applicator. (NOTE: Uncertified but trained pest management personnel may apply general-use pesticides under the supervision of certified personnel.) (NOTE: After receiving training from pest management personnel, nonpest-management personnel may apply pesticides in the following situations: - adult military housing occupants and facility building managers may apply approved self-help pesticides - military personnel may apply approved arthropod repellents (aerosol, creme, lotion, stick) - military personnel may apply approved aerosol insecticide for quarantine insect extermination on aircraft.) Verify that neither prisoners nor volunteer workers are assigned to apply pesticides. Verify that contractor personnel are certified prior to beginning the job.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-23. DOD-certified pesticide applicators must be recertified every 3 yr (DODI 4150.7, Encl. 4, para 5b(3).	Verify that DOD-certified pesticide applicators are recertified every 3 yr. (1)(4)(5)
KO.7-24. Restricted-use pesticides may be applied only by or under the direct supervision of certified pesticide applicators (FGS-ROK, Chapter 11, Criterion 3k and AFI 32-1053, para 2.4.3.)	Verify that restricted-use pesticides are applied only by or under the direct supervision of certified pesticide applicators. (4)(5) (NOTE: See Table 7-1 for a list of restricted-use pesticides.)
KO.7-25. Medical treatment facilities personnel may neither store nor use pesticides (AFI 32-1053, para 2.6.).	Verify that medical treatment facilities personnel neither store nor use pesticides. (2) (NOTE: This prohibition does not apply to disinfectants or germicides.)
KO.7-26. All pest management personnel must participate in a medical surveillance program (FGS-ROK, Chapter 11, Criterion 3c; AFI 32-1053, para 2.4.9.).	Verify that all pest management personnel are included in a medical surveillance program. (3)(4)(5) Verify that all BCE personnel who apply pesticides receive a baseline physical examination and an interview with PH within 30 days after they arrive. Verify that the program for pest management personnel includes: - baseline physical examination with a cholinesterase test - annual physical - a physical and cholinesterase test at least twice each year for pest management personnel who work with organophosphates or carbamate pesticides.
KO.7-27. All pest management personnel must be provided with PPE (FGS-ROK, Chapter 11, Criterion 3g).	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. (4)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-28. Specific operational practices should be observed in dealing with pesticides (MP).	Verify that health and safety procedures emphasizing good work habits, reduction or elimination of hazards, and use of PPE are followed. (4)(5) Verify that protective clothing and equipment are stored away from chemical areas. Verify that respirator cartridges/canisters are changed at appropriate intervals. Verify that periodic fit testing of respirators is conducted.
KO.7-29. Pest management personnel who mix and apply pesticides must meet specific requirements with regard to PPE and clothing (AFI 32-1053, para 3.4).	Verify that overalls are kept clean at all times. (4)(5) Verify that shop washing machines and dryers are used or that any clothing sent to base laundry services is clearly identified as being contaminated with pesticides.
KO.7-30. Individuals who handle pesticides must wear an approved respiratory device (DOD 4145.19-R-1, para 3-415a(6) and 3-415a(7)).	Verify that all personnel who handle pesticides wear an approved respiratory device that is appropriate for protection against the pesticides they use. (4)(5) Verify that all respirators, gas masks, cartridges, and canisters are Occupational Safety and Health Administration/Mine Safety and Health Administration (OSHA/MSHA) approved for the specific pesticide being handled. (NOTE: Paint respirators do not provide protection from pesticide vapors.)
KO.7-31. Installations must meet specific requirements with regard to their pest control vehicles (AFI 32-1053, para 3.6).	Verify that only pest management personnel use pest control vehicles. (4)(5) Verify that pest management vehicles are painted with a chemical-resistant coating (similar to fire department vehicles) and equipped with plastic bed liners. Verify that vehicles are equipped with locking compartments for safe handling, storage, and transport of pesticides. (NOTE: A telephone maintenance truck will suit the purpose.) Verify that the truck carries emergency phone numbers and a spill cleanup kit. Verify that placards are attached to trailer-mounted sprayers that identify the pesticide that is being applied. Verify that all pesticide dispersal equipment is kept in the BCE pest management section. (NOTE: Equipment at base golf courses that have certified pesticide applicators is exempt from this requirement.)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-31. (continued)	Verify that vehicles (prime movers) used for fogging, misting, dusting, or ultra-low volume (ULV) application are equipped with air-conditioning.
KO.7-32. Equipment used for pesticide applications should be dedicated to the pest management operation (MP).	Verify that such vehicles and dispersal equipment are used solely in support of pest management activities. (4)(5)
KO.7-33. Insecticides and termiticides must not be injected into the soil to control subterranean termites in any military buildings with subslab or in-slab heating, ventilation, or air-conditioning ducts (AFI 32-1053, para 2.4.11.).	Determine whether pesticide applications are undertaken to control subterranean termites. (1)(4) Verify that no subterranean termite control is undertaken for the types of buildings listed. (NOTE: This prohibition does not apply if such systems are made inoperable and duct registers are blocked to prevent air flow.)
KO.7-34. Installations must ensure the prevention of damage to wildlife from pesticide applications (DOD 4145.19-R-1, para 3-417).	Verify that basic precautions are observed that prevent drift of pesticides to the following: (1)(2)(4)(5) - wooded areas occupied by wildlife - land area not intended for treatment - fish-bearing waters. Verify that the installation guards against runoff or washoff by rain from treated areas to fish-bearing waters.
KO.7-35. Public safety should be ensured when applying or using pesticides (MP).	Verify that hazardous exposure to the general public has been eliminated by: (4)(5) - posting appropriate signs for treatment area - scheduling low use periods or restricted usage for a number of days - following water use restrictions and reentry times according to the pesticide labels.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
DOCUMENTATION AND NOTIFICATION	
KO.7-36. Copies of material safety data sheets (MSDSs) for all pesticides must be available at the storage and holding facility (FGS-ROK, Chapter 11, Criterion 3o).	Verify that MSDSs are available at the storage and holding facility for the pesticides used at the installation. (4)(5) (NOTE: Approved Korean pesticide labels are considered to be equivalent to MSDSs.)

KO.7-37. Records must be maintained and summary reports written for pest management activities (AFI 32-1053, para 2.4.13 and DODI 4150.7, para E.3.h.).	Verify that Work Information Management System (WIMS) pesticide software is used to track pesticide inventories and pesticide applicator certifications. (4)(5)
	
	Verify that daily pesticide use is recorded on the WIMS pesticide software.
	
	(NOTE: DD Forms 1532 and 1532-1 may be used if WIMS is not on-line.)
	
	Verify that historical data are kept on pesticide application in accordance with Air Force Manual (AFM) 37-139, *Record Disposition--Standards* (formerly Air Force Regulation (AFR) 4-20, volume 2).
	
	Verify that Quarterly Reports are sent no later than 15 days after the close of quarter to the MAJCOM.
	
	Verify that the Quarterly Reports include the following:
	
	- pesticide inventory data
	- pesticide applicator certification data
	- pesticide application data (equivalent of Report Control Symbol (RCS) DD-P&L[A&AR]1080) for all pest management operations on AF real property:
	  - pest management shop
	  - self-help pest control
	  - roads and grounds
	  - golf course
	  - contractors
	  - forestry
	  - lessee and land permit holders.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-38. Installations must meet additional record keeping requirements (DODI 4150.7, para E.3.v(7) and Encl. 4, para 10).	Verify that records of all pest management operations performed on the installation are properly maintained and reported to the component pest management consultant. (4)(5) Verify that the records: - account for all shop operations and provide a historical record of pest management operations and pesticide applications for each building, structures, or outdoor site - include information on kinds, amounts, uses, dates, places of application, and applicators' names and certification numbers - include all pesticide application performed on the installation, including work done on golf courses by nonappropriated fund activities, by contract services, and as a part of leases and land management and forestry programs as well as the work performed by the installation pest management shop. Verify that applications performed during military operations, excluding arthropod skin and clothing repellant, are recorded. Verify that DD Form 1532, Pest Management Report, or an equivalent computer product, is produced monthly using the DD Form 1532-1 information. Verify that these records are archived after 2 yr for permanent retention. (NOTE: Pesticides applied by installation personnel for their own relief are excluded from the record keeping requirements.)
KO.7-39. Notification must be made and/or approval received for certain application activities (AFI 32-1053, para 2.4.10 and 2.4.12.).	Verify that PH is notified prior to any pesticide applications in food preparation or consumption facilities, medical facilities, or child development centers. (3)(4)(6) Verify that PH and the fire department are notified prior to any fumigation activities. Verify that the Installation Pest Control Supervisor (i.e., pest management coordinator) coordinates all fumigations with installation medical, fire, security police, and safety personnel. Verify that no internal combustion or electrical power-driven spraying machines for aerosol or mist sprays are used inside buildings without approval from BES and the installation Fire Chief.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
PEST MANAGEMENT FACILITIES	
KO.7-40. Pesticide management facilities and service vehicles must be provided with spill kits (MIL-HDBK 1028-A, para 3.5.2.2, implementing FGS-ROK, Chapter 11, Criteria 3f and 3i).	Verify that pesticide management facilities and service vehicles are provided with spill kits. (4)(5)
KO.7-41. Installations must include certain features in pest management facilities (MIL-HDBK 1028-A, paras 3.1.3, 3.1.4.3, and 3.4.8, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that pest management facilities include at least the following: (1)(4) - 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.
KO.7-42. Pest management facilities must have security fencing and gates (MIL-HDBK 1028-A, para 3.4.6, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that a climb-resistant chain link fence prevents unauthorized entry. (1)(4) (NOTE: The fence may be omitted if other security measures, such as bars or heavy-gauge wire mesh over the windows, are taken.) Verify that the fence is at least 7 ft (2.13 m) high, without top rail. Verify that the fence fabric is twisted and barbed at the top and bottom. Verify that security gates to the fence are kept locked.
KO.7-43. Holding tanks are prohibited in new construction (MIL-HDBK 1028-A, para 3.5.2.3, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that the facility has no drainage to holding tanks. (4)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-44. Pest management facilities must be located in accordance with specific criteria (MIL-HDBK 1028-A, para 3.4.1 and 3.4.2, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that pest management facilities are located away from congested areas. (1)(4) Verify that new construction results in isolated, single-purpose structures. 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. Verify that the facility is located downhill from the above sensitive areas. (NOTE: Diking must be provided if space is limited.) Verify that the facility is not located uphill from potable water sources or continuously occupied structures. (NOTE: Facilities should not be located over aquifers (subsurface potable water supplies), unless the aquifer is adequately protected through containment measures.) Verify that the facility is located at least 100 ft (30.4 m) from other structures.
KO.7-45. Pest management facilities must meet specific standards with regard to accessibility, grading, and parking (MIL-HDBK 1028-A, para 3.4.3 through 3.4.5, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that vehicles carrying supplies or pulling trailer-mounted dispersal equipment have access to the facility. (1)(4) Verify that the facility is accessible to vehicles and pedestrians on at least two sides. Verify that runoff from fire-fighting is prevented from reaching ponds, lakes, streams, or rivers. (NOTE: Diking, if provided, is recommended for large pest management facilities only.) Verify that there is adequate space to park all pesticide dispersal equipment inside the pest management area, under cover. Verify that the part of the compound used for travel and vehicle parking is covered with gravel or paved. Verify that employee parking, if provided, is located outside the security fence or perimeter.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-46. The arrangement of spaces in pest management facilities must meet specific requirements (MIL-HDBK 1028-A, para 3.1.3 and 3.1.4.3, implementing FGS-ROK, Chapter 11, Criterion 3f).	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. (1)(4) Verify that there is no direct access between the office and the pesticide storage and mixing areas. Verify that doorways are arranged so that no pesticide need be carried through clean areas. Verify that the mixing room is located adjacent to the storage area and the equipment storage area (if indoors). Verify that the mixing room is accessible through the corridor to the shower and locker rooms and the exterior.
KO.7-47. Installations must meet specific requirements with regard to the foundations, floor slabs, and floor finishes in pest management facilities (MIL-HDBK 1028-A, para 3.1.5.1, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that there are no floor drains in the interior pesticide areas. (1)(4) Verify that, in areas where pesticides are handled or stored, floors slope (3/100) from sills to the center. Verify that, if the floor does not slope, a 4 in. (102 mm) concrete curb is provided in the pesticide areas. 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. Verify that exterior ramps slope downward from exterior flat (flushed) door sills. (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.) Verify that no utility, heating, or ventilation ducting is located in or below slabs. Verify that pesticide concentrates and finished (formulated) materials are prevented from entering the sanitary or storm sewer systems. Verify that concrete floors are finished with a nonabsorbent nonskid finish. (NOTE: Change rooms and office floors may be tiled.) Verify that the floors in both the storage and mixing areas are covered with nonskid epoxy sealant or are otherwise made impermeable.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-48. Installations must meet specific requirements with regard to the exterior walls of pesticide management facilities (MIL-HDBK 1028-A, para 3.1.5.2, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that exterior walls are constructed of metal, concrete, or masonry. (1)(4) Verify that the interior surfaces of exterior walls are constructed of metal, coated concrete, or masonry. Verify that no porous surface finishes are used.
KO.7-49. Installations must meet specific requirements with regard to the doors and windows in pesticide management facilities (MIL-HDBK 1028-A, para 3.1.5.3, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that exterior doors are self-locking and self-closing with weather stripping. (1)(4) Verify that doors have locks that prevent unauthorized entry. Verify that flat (flush) sills are provided for all doors between the mixing and storage areas. Verify that the facility has a 9 x 9 ft (2.74 x 2.74 m) overhead garage door with weather stripping. (NOTE: Higher doors may be necessary to accommodate high-mast equipment.) Verify that, if the garage is separate from the pesticide mixing and storage areas, a flat (flush) sill is provided for the garage doorway. 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. Verify that there is a slope away from the exterior of the door to prevent rain water from entering the facility. Verify that the pest management facility has nonporous framed windows that are double glazed, where appropriate, with a thermal barrier feature. Verify that, if the facility is not surrounded by a climb-resistant chain link fence and security gates, it has interior security mesh windows. (NOTE: It is permissible to have no windows as an alternative.) Verify that drop ceilings are not used in pesticide areas.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-50. A fire extinguisher must be provided by the door between the storage and mixing areas (MIL-HDBK 1028-A, para 3.7.1, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that a fire extinguisher is located by the door between the storage and mixing areas. (4)
KO.7-51. Drains from pesticide mixing areas must not be connected to septic systems, sanitary sewers, or stormwater systems (MIL-HDBK 1028-A, para 3.5.2.5, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that no pesticide mixing area is connected to septic systems, sanitary sewers, or stormwater systems. (1)(4)
KO.7-52. Pesticide management areas must have backflow prevention devices (MIL-HDBK 1028-A, para 3.5.2.10 and 3.5.2.11, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that reduced pressure backflow prevention devices are installed on plumbing that provides a source of water for filling pesticide dispersal equipment tanks. (1)(4) Verify that permanent hose bibs (overhead filling pipes) have a discharge hose and an approved backflow prevention device. (NOTE: The requirement as to hose bibs applies to outdoor washdown areas of medium and large facilities.)
KO.7-53. Mixing and storage areas must have a ventilation system separate from that in the rest of the facility (MIL-HDBK 1028-A, para 3.5.4.2, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that mixing and storage areas have a ventilation system separate from that in the rest of the facility. (1)(4) Verify that the system is provided with a roof-mounted, centrifugal fan system selected for a minimum of six air changes per hour. Verify that fans discharge vertically. Verify that replacement air is heated to 55 °F (13 °C). Verify that the ventilation system has a control switch with a light to indicate ON the entrance to the pesticide handling areas.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-53. (continued)	Verify that the control switch has a sign that reads as follows: VENTILATION SYSTEM SHOULD OPERATE CONTINUOUSLY DO NOT ENTER UNLESS VENTILATION SYSTEM HAS OPERATED FOR AT LEAST 10 MINUTES.
KO.7-54. Mixing sinks must have slotted hood, local exhaust systems (MIL-HDBK 1028-A, para 3.5.4.2, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that the mixing sink has a slotted hood, local exhaust system. (4)
KO.7-55. Outdoor hardstands and parking aprons for vehicles must meet specific standards (MIL-HDBK 1028-A, para 3.4.8, implementing FGS-ROK, Chapter 11, Criterion 3f).	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)). (1)(4) Verify that the hardstand pad slopes (3/100) to a sump fitted with a removable grate cover suitable for the anticipated vehicular traffic load. 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. 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. Verify that, if an industrial sewer is available, a 3 in. (75 mm) sump drain is provided. Verify that, if a connection to an industrial sewer exists, the sump has a ball valve in the sump drain to control discharge. Verify that the valve is located adjacent to the sump in a pit with a grate cover. Verify that the ball valve is normally closed and manually opened. Verify that, if no industrial sewer is available, a small section of removable grate is provided to accommodate a hose for recovering sump contents. Verify that the hardstand area has an elevated hose bib (fill pipe) of 1.5 to 2 in. (38 to 51 mm) diameter. (NOTE: This requirement applies if application equipment with tanks 50 gal (189.9 L) or larger will be used at the facility.)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-55. (continued)	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. (NOTE: This requirement does not apply if devices inside the facility are accessible within 10 s from the outdoor mixing site.) (NOTE: The hardstand area may be provided with a canopy roof to protect parked vehicles and equipment and to minimize the accumulation of water.)
KO.7-56. Pesticide management facilities must meet specific requirements with regard to signs (MIL-HDBK 1028-A, para 3.8, implementing FGS-ROK, Chapter 11, Criteria 3f and 3i).	Verify that identification signs are provided in appropriate rooms and buildings and on fences. (1)(4)(5) (NOTE: Signs such as DANGER, POISON, PESTICIDE STORAGE AREA are suggested.) Verify that a NO SMOKING sign is located in pesticide areas. Verify that warning signs are provided on the exterior of the building at each entrance. Verify that building identification information is visible from 100 ft (30.48 m). Verify that a sign is installed over the sink that reads as follows: DO NOT DISCHARGE PESTICIDES INTO THE SINK. Verify that a sign is posted at the entrance(s) to toilets that reads: WASH HANDS BEFORE USING TOILET. Verify that the hardstand has a sign that reads as follows: CLOSE DRAIN WHILE HANDLING PESTICIDES ON HARDSTAND. Verify that a sign is provided near the hardstand's pit valve stating: RECOVER PESTICIDE SPILLS USE VALVE TO DRAIN WASHWATER AND RAIN. Verify that, if a flammable liquid storage cabinet is present, a sign is provided that reads as follows: FLAMMABLE PESTICIDES.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-56. (continued)	Verify that a list of the types of materials stored is posted on the outside of the storage area. (NOTE: Copies of this list should be given to the installation on-scene hazardous waste coordinator and to the fire department.) Verify that the list includes chemical names and formulations rather than generic brand names. 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.
STORAGE, MIXING, AND PREPARATION OF PESTICIDES	
KO.7-57. Stored pesticides must be addressed in the installation spill contingency plan and spill prevention control and countermeasures plan (FGS-ROK, Chapter 11, Criterion 3e).	Verify that these plans address procedures and techniques used to contain and cleanup a pesticide spill. (1)(2) (NOTE: See Section 8, *POL Management*.)
KO.7-58. Labels on pesticides must bear the appropriate instructions and warnings concerning the pesticide (FGS-ROK, Chapter 11, Criterion 3h).	Verify that the pesticides are properly labeled in both English and Hangul. (4)(5) Verify that labels bear: - the appropriate use instructions - a precautionary message based on the toxicity category of the pesticide - environmental hazards - storage and disposal requirements. (NOTE: Examples of precautionary messages include DANGER, WARNING, or CAUTION.)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-59. Pesticide storage areas must be regularly inspected and secured to prevent unauthorized access (FGS-ROK, Chapter 11, Criterion 3j and MIL-HDBK 1028-A, para 3.1.4.1.1, implementing FGS-ROK, Chapter 11, Criteria 3f and 3i).	Verify that storage areas are inspected monthly and secured to prevent unauthorized access. (4)(5)
KO.7-60. Pesticide storage areas must have a readily visible, current inventory of all items in storage (FGS-ROK, Chapter 11, Criterion 3j).	Verify that the inventory includes all items in storage and items awaiting disposal. (1)(2)(4)(5)
KO.7-61. Herbicides and insecticides must be stored separately in order to avoid cross contamination or adverse reactions (FGS-ROK, Chapter 11, Criterion 3j).	Verify that herbicides and insecticides are stored separately in order to maintain sufficiently safe segregation. (4)(5) Verify that the storage facility uses 4 ft [≈122 cm] aisles to separate herbicides and insecticides.
KO.7-62. Indoor storage areas for pesticides must meet specific requirements (MIL-HDBK 1028-A, para 3.1.4.1.2, implementing FGS-ROK, Chapter 11, Criterion 3i).	Verify that pesticides are stored in an area sealed or separated from clean areas, with direct access to the exterior. (1)(4)(5) Verify that pesticides are stored in such a way that: - they are off the floor, with all labels visible - they are stored no more than 8-ft (2.44-m) high. Verify that lanes are present to provide effective access and inspection. 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).

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-62. (continued)	Verify that pesticides are stored separated from the following areas: - mixing areas - shower and locker room - offices - any area where personnel work for prolonged periods. Verify that no pesticide concentrates are stored in a room containing a floor drain of any type. Verify that storage and mixing areas have containment provided either by curbing or sloped floors.
KO.7-63. Certain chemicals must be stored outside of occupied buildings (MIL-HDBK 1028-A, para 3.1.4.1.4, implementing FGS-ROK, Chapter 11, Criterion 3i).	Verify that all liquid fumigants are stored outside of occupied buildings in hazardous chemical lockers. (4) Verify that toxic or flammable pesticides are stored on the ground floor of unoccupied buildings.
KO.7-64. Outdoor storage areas for pesticides must meet specific requirements (MIL-HDBK 1028-A, para 3.1.4.1.4, implementing FGS-ROK, Chapter 11, Criteria 3f and 3i).	Verify that outdoor storage areas for pesticides are: (4) - secured and under cover - protected from radiant heating, freezing temperatures, and moisture.
KO.7-65. Motor vehicles may not be stored in the same areas as pesticides (MIL-HDBK 1028-A, para 3.1.4.1.3, implementing FGS-ROK, Chapter 11, Criterion 3i).	Verify that no motor vehicles are stored in the same area as pesticides. (4)(5) (NOTE: Wherever possible, vehicles are to be located outside or in a separate building from the pesticide storage or handling area.) Verify that, where 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.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-66. Mixing rooms must meet specific requirements (MIL-HDBK 1028-A, para 3.1.4.2, implementing FGS-ROK, Chapter 11, Criterion 3f).	Verify that mixing rooms have electricity and hot and cold water. (4) Verify that mixing rooms have metal or plastic shelves to hold pesticides off the floor. (NOTE: Plastic is preferred for the pallets, and steel stands are recommended for keeping drums off the floor.) Verify that no wooden pallets are in use. Verify that the work area contains a pesticide-resistant sink equipped with the following: - 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.
KO.7-67. Installations should store pesticides, pesticide containers, and pesticide residues in accordance with specific restrictions (MP).	Verify that pesticides, pesticide containers, and/or pesticide residues are stored such that: (4)(5) - labeling is consistent - there is no open dumping of pesticides or pesticide containers - there is no open burning, except when allowed by regulation - there is no water dumping or ocean dumping.
KO.7-68. Installations must store contingency pesticides under the same controlled temperature, security, and other conditions as daily use pesticides (AFI 32-1023, para 2.4.6.).	Verify that the installation stores contingency pesticides under the same controlled temperature, security, and other conditions as daily use pesticides. (1)(4)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-69. Installations must rotate contingency pesticide stocks back to pest management shop inventories and replace them with fresh chemicals annually (AFI 32-1023, para 2.4.6.).	Verify that the installation rotates contingency pesticide stocks back to pest management shop inventories and replaces them with fresh chemicals annually. (1)(4)
HIGHLY AND MODERATELY TOXIC PESTICIDES	
KO.7-70. Installations should consider installing an environmental monitoring system in the vicinity of pesticide storage facilities under certain conditions (MP).	Verify that the installation has considered providing monitoring systems when appropriate. (1)(4)(5) (NOTE: Monitoring systems are particularly appropriate when there is no spill management system and when the facility handles large quantities of pesticides and is located near a sensitive area.)
KO.7-71. Storage facilities for pesticides and excess pesticides that are classed as highly toxic or moderately toxic and that must be labeled DANGER, POISON, WARNING, or with the skull and crossbones should meet specific requirements (MP).	Verify that the site location, where possible, is in an area where flooding is unlikely and where hydrogeologic conditions prevent contamination of any water system by runoff or percolation. (1)(4)(5) (NOTE: The following may be considered: - proximity to surface water and to sanitary wastewater or stormwater systems - location relative to floodplains, depth of groundwater, and general soil types and typical permeabilities.) Verify that storage is in a dry, separate room, building, or covered area where fire protection is provided. Verify that: - pesticide containers are stored with the labels plainly visible - all containers are in good condition - the lids and bungs on metal or rigid plastic containers are tight - the pesticides are segregated, and if practicable, stored under a sign containing the name of the formulation - rigid containers are stored upright and all containers are stored off of the ground. Verify that containers are regularly inspected for corrosion and leaks and that absorbent material is available for spill cleanup.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-71. (continued)	Verify that excess pesticides and containers are segregated.
KO.7-72. Personnel in storage/usage facilities for pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol, should follow specific practices and procedures to ensure safety (MP).	Verify that no food consumption, drinking, smoking, or tobacco use is undertaken in any area where pesticides are present. (4)(5) Verify that the following practices are part of pest management operations: - people handling pesticides keep hands away from mouths and eyes and wear rubber gloves during all pesticide handling - people handling pesticides wash hands immediately upon completion of working with pesticides and always prior to eating, smoking, or using toilet facilities - inspections are made once a month to determine if any pesticide containers are leaking - pesticide containers are inspected for leakage prior to handling.
KO.7-73. Installations must post signs and safety procedures in pesticide storage facilities and equipment that contain or use pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol (MP).	Verify that signs reading DANGER, POISON, and PESTICIDE STORAGE are posted on or near entries to storage facilities. (4)(5) Verify that safety precautions and accident prevention measures are posted. Verify that an inventory of pesticides is displayed outside of the storage facility, identifying all chemicals in storage. Verify that mobile equipment used for pesticide applications is labeled: CONTAMINATED WITH PESTICIDES.
KO.7-74. Installations must notify the local fire department, hospitals, public health officials, and police department in writing that pesticides are being stored (MP).	Verify that notification has been submitted and includes a statement of the hazards that pesticides may present during a fire. (3)(6) Verify that a floor plan of the storage facility, indicating the location of the different pesticide classifications, has been submitted to the fire department. Verify that the fire chief has the home telephone numbers of the person(s) responsible for the pesticide storage facility. (NOTE: These requirements apply where large quantities of pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol are being stored, or where other conditions warrant.)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-75. Certain precautions should be taken in the event of a fire at a pesticide storage area where pesticides are classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol (MP).	Verify, by interviewing the fire chief, that the following precautions are taken: (6) - fire fighting personnel wear supplied air suits and rubberized clothing - personnel avoid breathing or otherwise contacting toxic smoke and fumes - personnel wash completely as soon as possible after encountering smoke and fumes - water used in fire fighting is contained within the storage site drainage system - individuals who might be threatened by the fumes/smoke are evacuated - firemen take cholinesterase tests after fighting fires involving organophosphate or N-alkyl carbamate pesticides.
DISPOSAL	
KO.7-76. Installation pest management programs must be conducted so as to ensure that pesticides do not become hazardous wastes (DODI 4150.7, Encl. 4, para 6c and FGS-ROK, Chapter 11, Criterion 3L).	Verify that the installation's pest management program is conducted so as to ensure that pesticides do not become hazardous wastes. (1)(4)(5) Verify that excess USEPA registered pesticides are either: - returned to the DLA Materials Return Program - transferred to a DOD installation able to use the materials - transferred to the servicing DRMO. (NOTE: The component pest management consultant can, if requested, provide assistance in identifying installations were usable pesticides could be used.) (NOTE: When the USEPA publishes a proposed pesticide regulatory action involving pesticide label suspension or cancellation that affects DOD, installations are required to comply with administrative procedures developed between the DLA and AFPMB.) Verify that unserviceable excess pesticides are turned in to the local Defense Reutilization and Marketing Office (DRMO) for disposal.
KO.7-77. If waste pesticides are generated, the installation must dispose of them in accordance with specific standards (FGS-ROK, Chapter 11, Criteria 3m and 3n; and AFI 32-1053, para 3.5.5).	Verify that pesticide wastes are tested to determine whether they are hazardous waste. (1)(2)(4)(5) Verify that pesticide wastes generated from pesticide spills or improper mixes are considered as hazardous waste and disposed of in accordance with the provisions of Section 4, *Hazardous Waste Management.* Verify that, if the pesticide waste is not a hazardous waste, it is disposed of in accordance with the label instructions.

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.7-78. Installations must properly dispose of any clothing that is heavily contaminated with pesticides (AFI 32-1053, para 3.4.2.).	Verify that the installation properly disposes of any clothing that is heavily contaminated with pesticides. (4)(5)
KO.7-79. No concentrated pesticides may be discarded to the sanitary sewer or storm drain (MIL-HDBK 1028-A, para 3.5.2.1, implementing FGS-ROK, Chapter 11, Criteria 3f and 3i).	Verify that no concentrated pesticides are discarded to the sanitary sewer or storm drain. (1)(4)(5)

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Table 7-1

Restricted-Use Pesticides

(40 CFR 152.175)

The following uses of pesticide products containing the active ingredients specified below have been classified for restricted use and are limited to use by or under the direct supervision of a certified applicator.

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Acrolein	As sole active ingredient. No mixtures registered.	All uses	Restricted	Inhalation hazard to humans. Residue effects on avian species and aquatic organisms.
Aldicarb	As sole active ingredient. No mixtures registered.	Ornamental uses (indoor and outdoor). Agricultural crop uses.	*do Under further evaluation.	Other hazards-accident history.
Aluminum phosphide	As sole active ingredient. No mixtures registered.	do	do	Inhalation hazard to humans.
Azinphos methyl	All liquids with a concentration greater than 13.5 percent. All other formulations.	do do	do Under further evaluation.	do
Carbofuran	All concrete suspensions and wettable powders 40 percent and greater. All granular formulations. All granular and fertilizer formulations.	do Rice All uses except rice.	do Under evaluation. do	Acute inhalation toxicity.
Chloropicrin	All formulations greater than 2 percent. All formulations. All formulations 2 percent and less.	All uses. Rodent control. Outdoor uses (other than rodent control).	Restricted Restricted Unclassified	Acute inhalation toxicity. Hazard to nontarget organisms.

*do means same as above (previous row).

(continued)

Table 7-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Clonitralid	All wettable powders 70 percent and greater. All granulars and wettable powders. Pressurized sprays 0.55 percent and less.	All uses. Molluscide uses. Hospital antiseptics.	do do Unclassified	Acute inhalation toxicity. Effects on aquatic organisms.
Dicrotophos	All liquid formulations 8 percent and greater.	All uses.	Restricted	Acute dermal toxicity; residue effects on avian species (except for tree injections).
Disulfoton	All emulsifiable concentrates 65 percent and greater, all emulsifiable concentrates and concentrate solutions 21 percent and greater with fensulfothion 43 percent and greater, all emulsifiable concentrates 32 percent and greater in combination with 32 percent fensulfothion and greater. Nonaqueous solution 95 percent and greater. Granular formulations 10 percent and greater.	do Commercial seed treatment. Indoor uses (greenhouse).	Restricted Restricted do	do Acute inhalation toxicity. Acute dermal toxicity. Acute inhalation toxicity.
Ethoprop	Emulsifiable concentrates 40 percent and greater. All granular and fertilizer formulations.	do do	do Under evaluation.	Acute dermal toxicity.
Ethyl parathion	All granular and dust formulations greater than 2 percent fertilizer formulations, wettable powders, emulsifiable concentrates, concentrated suspensions, concentrated solutions.	do	Restricted	Inhalation hazard to humans. Acute dermal toxicity. Residue effects or mammalian, aquatic, avian species.

*do means same as above (previous row).

(continued)

Table 7-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Ethyl parathion (continued)	Smoke fumigants.	do	do	Inhalation hazard to humans.
	Dust and granular formulations 2 percent and below.	do	do	Other hazards-accident history.
Fenamiphos	Emulsifiable concentrates 35 percent and greater.	do	do	Acute dermal toxicity.
Fonofos	Emulsifiable concentrates 44 percent and greater.	All uses.	do	Acute dermal toxicity.
	Emulsifiable concentrates 12.6 percent and less with pebulate 50.3 percent and less.	Tobacco	Unclassified	
Methamidophos	Liquid formulations 40 percent and greater.	All uses.	Restricted	Acute dermal toxicity; residue effects on avian species.
	Dust formulations 2.5 percent and greater.	All uses.	Restricted	Residual effects on avian species.
Methidathion	All formulations.	All uses except stock safflower and sunflower.	Restricted	Residue effects on avian species.
	All formulations.	Nursery stock, safflower, and sunflower.	Unclassified	Residue effects on avian species.

*do means same as above (previous row).

(continued)

Table 7-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Methomyl	As sole active ingredient in 1 percent to 2.5 baits (except 1 percent fly bait).	Nondomestic outdoor agricultural crops, ornamental and turf. All other registered uses.	Restricted	Residue effects on mammalian species.
	All concentrated solution formulations.	do	do	Other hazards accident history.
	90 percent wettable powder formulations (not in water soluble bags).	do	do	do
	90 percent wettable powder formulation in water soluble bags.	do	Unclassified	
	All granular formulations.	do	do	
	25 percent wettable powder formulations.	do	do	
	In 1.24 percent to 2.5 percent dusts as sole active ingredient and in mixtures with fungicides and chlorinated hydrocarbon, inorganic phosphate and biological insecticides.	do	do	
Methyl bromide	All formulations in containers greater than 1.5 lb.	All uses.	Restricted	Other hazards accident history.
	Containers with not more than 1.5 lb of methyl bromide with 0.25 percent to chloropicrin as an indicator.	Single applications (nondomestic use) for soil treatment in closed systems.	Unclassified	
	Containers with not more than 1.5 lb having no indicator.	All uses.	Restricted	do

*do means same as above (previous row).

(continued)

Table 7-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Methyl parathion	All dust and granular formulations less than 5 percent.	do	do	Other hazards-accident history. All foliar applications restricted based on residue effects on mammalian and avian species.
	Microencapsulated. All dust and granular formulations 5 percent and greater and all wettable powders and liquids.	do	do	Residue effects on avian species. Hazard to bees. Acute dermal toxicity. Residue effects on mammalian and avian species.
Nicotine (alkaloid)	Liquid and dry formulations 14 percent and above.	Indoor (greenhouse).	Restricted	Acute inhalation toxicity.
	All formulations.	Applications to cranberries.	Restricted	Effects on aquatic organisms.
	Liquid and dry formulations 1.5 percent and less.	All uses (domestic and nondomestic).	Unclassified	
Paraquat (dichloride) and paraquat bis(methylsulfate)	All formulations and concentrations except those listed below.	All uses.	Restricted	Other hazards. Use and accident history, human toxicological data.
	Pressurized spray formulations containing 0.44 percent Paraquat bis(methylsulfate) and 15 percent petroleum distillates as active ingredients.	Spot weed and grass control.	do	
	Liquid fertilizers containing concentrations of 0.025 percent paraquat dichloride and 0.03 percent atrazine; 0.03 percent paraquat dichloride and 0.37 percent atrazine, 0.04 percent paraquat dichloride and 0.49 percent atrazine.	All uses.	Unclassified	

*do means same as above (previous row).

(continued)

Table 7-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Phorate	Liquid formulations 65 percent and greater.	do	Restricted	Acute dermal toxicity. Residue effects on avian species (applies to foliar applications only). Residue effects on mammalian species (applies to foliar application only).
	All granular formulations.	Rice	Restricted	Effects on aquatic organisms.
Phosphamidon	Liquid formulations 75 percent and greater.	do	do	Acute dermal toxicity. Residue effects on mammalian species. Residue effects on avian species.
	Dust formulations 1.5 percent and greater.	do	do	Residue effects on mammalian species.
Picloram	All formulations and concentrations except tordon 101R.	do	do	Hazard to nontarget organisms (specifically nontarget plants both crop and noncrop).
	Tordon 101 R forestry herbicide containing 5.4 percent picloram and 20.9 percent 2, 4-D.	Control of unwanted trees by cut surface treatment.	Unclassified	
Sodium cyanide[3]	All capsules and ball formulations.	All uses.	Restricted	Inhalation hazard to humans.
Sodium fluoroacetate	All solutions and dry baits.	do	do	Acute oral toxicity. Hazard to nontarget organisms. Use and accident history.

*do means same as above (previous row).

(continued)

Table 7-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification[1]	Criteria Influencing Restriction
Strychnine	All dry baits pellets and powder formulations greater than 0.5 percent.	do	do	Acute oral toxicity. Hazard to nontarget avian species. Use and accident history.
	All dry baits pellets and powder formulations.	All uses calling for burrow builders.	do	Hazard to nontarget organisms.
	All dry baits, and pellets, and powder formulations 0.5 percent and below.	All uses except subsoil.	do	do
	do	All subsoil uses.	Unclassified	do
Sulfotepp	Sprays and smoke generators.	All uses.	Restricted	Inhalation hazard to humans.
Zinc Phosphide	All formulations 2 percent and less.	All domestic uses and nondomestic uses in and around buildings.	Unclassified	
	All dry formulations 60 percent and greater.	All uses.	Restricted	Acute inhalation toxicity.
	All bait formulations.	Nondomestic outdoor uses (other than around buildings).	Restricted	Hazard to nontarget organisms.
	All dry formulations 10 percent and greater.	Domestic uses.	Restricted	Acute oral toxicity.

*do means same as above (previous row).

NOTES:

[1] Under evaluation means no classification decision has been made and the use/formulation in question is still under active review within the USEPA.

[2] Percentages given are the total of dioxathion plus related compounds.

[3] NOTE: M-44 sodium cyanide capsules may only be used by certified applicators who have also taken the required additional training.

The provisions in this amended table were effective as of 8 August 1995.

INSTALLATION:	COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 8

PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT

Korea ECAMP

SECTION 8

PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT

A. Applicability of this Section

This section applies to U.S. Air Force (USAF) installations that store, transport, dispose of, or use petroleum, oil, and lubricant (POL), including petroleum-based fuels. The section presents review action items that respond to regulations, procedures, and organizational mechanisms designed to prevent or limit the accidental release of POL materials to surface water, groundwater, or soils. Procedures to control volatile organic compounds (VOCs) from POL sources are addressed in Section 1, *Air Emissions Management.*

This section covers management of pipeline delivery systems, truck fill stands, immediate operating storage areas, and fueling/defueling flightline operations. POL materials addressed include jet fuel (JP-4, fuel oil, JP-8), aviation gasoline (AVGAS), motor gasoline (MOGAS), diesel fuel, and lubricating oils. Waste petroleum-based solvents (including PD-680) are addressed in Section 4, *Hazardous Waste Management.*

The regulatory requirements in this section are based on Department of Defense (DOD) regulations, Air Force Regulations (AFRs), and Air Force Instructions (AFIs) that apply at overseas installations. Management Practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force (AF) employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 9, outlines the criteria for the control and abatement of pollution from the storage, transfer, and distribution of petroleum products. Chapter 18 contains criteria for a spill plan and a contingency plan.

C. U.S. Air Force Documents

- AFI 13-212, Volume 1, *Weapons Ranges*, 28 July 1994, includes a number of provisions relevant to the handling of used POL generated at air-to-surface weapons ranges.

- AFI 23-201, *Fuels Management*, 28 July 1994, provides managers at all AF activities with policy and procedures for fuels operations.

- AFI 23-502, *Recoverable and Unusable Liquid Petroleum Products*, 6 April 1994, sets goals, assigns responsibilities, and provides guidance for recovering usable and disposing of unusable liquid petroleum products. The Instruction applies to lubricating oils, aviation fuel, distillates, and gasoline.

- Air Force Manual (AFM) 85-16, *Maintenance of Petroleum Systems*, governs the maintenance of permanently installed storage and dispensing systems for petroleum and unconventional fuels.

- AFTO 42B-1-23, *Management of Recoverable and Waste Liquid Petroleum Products*, provides guidelines for collecting, segregating, and processing reclaimed, recoverable, and waste petroleum products.

D. Responsibility for Compliance

- The Base Environmental Protection Committee (EPC) is usually responsible for drafting and reviewing the Spill Prevention, Control, and Countermeasures (SPCC) Plan prior to its promulgation by the Base Commander and for the annual review and update of the SPCC Plan. Often, the EPC delegates the specific preparation of the plan to the Base Civil Engineer (BCE) for implementation by the Base Environmental Coordinator (BEC).

- The Installation Response Team (IRT) responds to spills, when requested by an Installation On-Scene Commander (IOSC), and performs spill containment, recovery, cleanup, disposal, and restoration activities as directed by the IOSC. The IRT is a multidisciplinary team often including the following: BCE, BEC, Bioenvironmental Engineering Services (BES), Fire Chief, Security Police Chief, Public Affairs Officer, Base Fuels Officer, Safety Chief, and Staff Judge Advocate (SJA).

- The Base Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible for making periodic fire safety inspections of flammable/combustible storage and handling areas, hazardous waste storage areas, and accumulation points on the installation.

- The Safety Manager is responsible for conducting workplace safety evaluations and inspections of the handling and storage of hazardous materials and waste. The Safety Manager will provide the appropriate manager with a report of his or her findings and recommended corrective actions. The Safety Manager is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.

- The Base Fuels Management Officer (BFMO) is responsible for the safe and efficient receipt, storage, handling, issuing, and accounting of all petroleum products and for all general operations and inspections.

- The Base Civil Engineer (BCE) is responsible for the maintenance of all installed petroleum storage and dispensing systems. This responsibility often is discharged by the Liquid Fuels Maintenance (LFM) shop. The BCE also is responsible for the calibration of permanently installed meters.

- The Base Environmental Coordinator (BEC) monitors all POL activities that may affect the environment and usually is responsible for the coordination of the EPC review and updates of the spill plan. The BEC often coordinates notification of reportable spills on behalf of the IOSC.

- The Bioenvironmental Engineering Services (BES) takes samples to determine the chemical nature, pollutant concentration, and extent of each reportable-quantity spill as required for response actions and documentation.

E. Definitions

- *Discharge* - any release into the environment including but not limited to any spilling, leaking, pumping, pouring, emitting, emptying, or dumping (FGS-ROK, Chapter 9, Definitions).

- *Generating Activity* - a base agency (host, tenant, or contractor) that generates recoverable or unusable petroleum products (AFI 23-502, Attachment 1, Section B).

- *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. A listing of these substances and corresponding reportable quantity is contained in Table 4-1, Chart A.4. The term does not include (FGS-ROK, 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 Waste Fuel* - a waste petroleum product mixed with a hazardous waste or exhibiting a characteristic of hazardous waste, in which there is an intent to discard (AFI 23-502, Attachment 1, Section B).

- *Installation On-Scene Coordinator (IOSC)* - the official who directs control and cleanup efforts at the scene of a POL or hazardous substance spill due to USFK activities on or near the installation. This official is designated by the Installation Commander (IC) (FGS-ROK, Chapter 18, Definitions).

- *Installation Response Team (IRT)* - a team performing emergency functions as defined and directed by the IOSC (FGS-ROK, Chapter 18, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Off-Installation Spill* - an uncontained release to the land or water where USFK lacks jurisdiction (FGS-ROK, Chapter 18, Definitions).

- *Off-Specification Product* - product which has one or more off-specification characteristics (e.g., color, vapor pressure, flashpoint, etc.). Off-specification products can be blended as regraded products. Off-specification products are not identified as hazardous waste fuel (AFI 23-502, Attachment 1, Section B).

- *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-ROK, Chapter 18, Definitions).

- *On-Installation Spill* - an uncontained release to the land or water under USFK control (FGS-ROK, Chapter 18, Definitions).

- *On-Specification Product* - product of suitable quality for return to the base inventory. AFTO 42B-1-23, Table 3-1, *Management of Recoverable and Waste Liquid Petroleum Products*, sets the criteria for a suitable quality. Do not consider as off-specification if solids and water that can be removed by rotation through on-hand separators are present (AFI 23-502, Attachment 1, Section B).

- *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-ROK, Chapter 9, Definitions).

- *POL* - oil of any kind, including but not limited to, petroleum, oils, lubricants (including synthetic oils), fuel, oil sludges, oil refuse, and oil mixed with other wastes. Refined petroleum, oils and lubricants include synthetic oils, oil sludges, and oily wastes (FGS-ROK, 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 (q.v.) (FGS-ROK, Chapter 9, Definitions).

- *Recoverable Products* - products that still have useful physical or chemical properties; see *Off-Specification Product* and *On-Specification Product* (AFI 23-502, Attachment 1, Section B).

- *Recyclable Products* - products determined to be surplus to AF needs that are burned for energy recovery (e.g., JP-4 contaminated with hydraulic fuel and used lubricating oil are recyclable products when burned for energy recovery as a fuel) (AFI 23-502, Attachment 1, Section B).

- *Reportable Quantity (RQ)* - for POL, a released quantity of 110 gal [≈416 L] or more (FGS-ROK, Chapter 18, Definitions).

  (NOTE: RQs for other substances are listed in the RQ column, Table 4-1, Chart A.4.)

- *Significant Spill* - an uncontained release to the land or water in excess of any of the following quantities (FGS-ROK, 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 reportable quantity listed therein
  2. for POL or liquid or semi-liquid hazardous material, hazardous waste or hazardous substance, in excess of 415 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).

- *Unusable Petroleum Product* - product that is no longer suitable for any use on an installation due to excessive contamination or quality degradation (AFI 23-502, Attachment 1, Section B).

- *U.S. Industry Standards* - those standards adopted by independent professional organizations, including, but not limited to (FGS-ROK, Chapter 9, Definitions):
  1. American Society for Testing and Materials (ASTM)
  2. American National Standards Institute (ANSI)
  3. American Petroleum Institute (API)
  4. National Association of Corrosion Engineers (NACE)
  5. National Fire Protection Association (NFPA)
  6. Underwriters Laboratories (UL).

- *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-ROK, 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 processed from used oil by processing, blending, or other treatment (FGS-ROK, Chapter 6, Definitions).

PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.8-1 through KO.8-6	(1)(2)(3)(4)(11)
POL Management	KO.8-7 through KO.8-13	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)
Pipelines	KO.8-14 through KO.8-19	(1)(3)(4)(7)
Discharges/Spills	KO.8-20 and KO.8-23	(1)(2)(3)(4)(5)(6)
Used POL/Waste POL	KO.8-24 through KO.8-29	(1)(2)(3)(5)(8)(10)

(a) CONTACT/LOCATION CODE:

(1) BEC (Base Environmental Coordinator)
(2) BCE (Base Civil Engineer)
(3) BFMO (Base Fuels Management Office)
(4) LFM (Liquid Fuels Maintenance)
(5) BES (Bioenvironmental Engineering Services)
(6) Base Fire Department
(7) Power Production
(8) AAFES (Army/Air Force Exchange Service) Service Station Manager
(9) Generating Activities
(10) Vehicle Maintenance Shop
(11) Base Staff Judge Advocate

PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT

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

Physical Features To Inspect

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

People To Interview

- BEC (Base Environmental Coordinator)
- BCE (Base Civil Engineer)
- BFMO (Base Fuels Management Office)
- LFM (Liquid Fuels Maintenance)
- BES (Bioenvironmental Engineering Services)
- Base Fire Department
- Power Production
- AAFES (Army/Air Force Exchange Service) Service Station Manager
- Generating Activities
- Vehicle Maintenance Shop
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ALL INSTALLATIONS	
KO.8-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.8-2. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 13-212, Volume I, *Weapons Ranges*, 28 July 1994 - AFI 23-201, *Fuels Management,* 28 July 1994 - AFI 23-502, *Recoverable and Unusable Liquid Petroleum Products*, 6 April 1994 - AFM 85-16, *Maintenance of Petroleum Systems.* Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the base Environmental Protection Committee.
KO.8-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning POL management have been issued since the finalization of the manual. (1)(2)(11) Verify that the installation is in compliance with newly issued regulations.
KO.8-4. Installations must have in place a program for the management of recoverable and unusable liquid petroleum products (AFI 23-502, para 6.2 through 8.7).	(NOTE: This requirement applies to lubricating oils, aviation fuel, distillates, and gasoline.) Verify that the installation has a comprehensive program to manage the segregation and collection, reuse, or recycling of recoverable petroleum products and the disposition of unusable petroleum products. (1)(3)(4) (NOTE: Documentation may be in the form of a plan or a base operating instruction.)

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BFMO (Base Fuels Management Office) (4) LFM (Liquid Fuels Maintenance) (5) BES (Bioenvironmental Engineering Services) (6) Base Fire Department (7) Power Production (8) AAFES (Army/ Air Force Exchange Service) Service Station Manager (9) Generating Activities (10) Vehicle Maintenance Shop (11) Base Staff Judge Advocate

COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.8-4. (continued)	Verify that the program includes: - specific responsibilities and criteria for the collection, storing, returning to inventory, reusing, recycling, and disposing of all unusable petroleum products and hazardous waste fuels generated at the base - identification of generating activities by organization - a list of all recoverable and unusable products and hazardous waste fuels generated by an organization, including source, approximate quantity, and condition - specific responsibilities of base organizations - the methods and facilities available to the base to collect, store, return to inventory, reuse, recycle, and dispose of products - accounting procedures for recoverable and unusable petroleum products and procedures to credit organizations using the guidelines in AFMAN 23-110, *USAF Supply Manual* - specific base and organizational procedures for the entry, exit, and control of unusable petroleum product vehicles - stress on sound conservation and property management of unusable products - where feasible, specification of positive product control by designating pick up locations, verifying pick up quantities, and whenever possible, using a single entry and exit. (NOTE: The priorities for disposition of products are: - return on-specification fuel to the base inventory or use as the original grade - return off-specification fuel to the base inventory and blend into the original or different grade making a regraded product - recycle products on base by reusing in secondary applications such as a heating fuel - categorize any remaining products as surplus, send them as recyclable products to DRMO, credit DRMO sales to the base RRR account - contract with a service company to remove nonrecylable waste from the base.) Verify that the BCE has developed procedures at the base level for the disposal of petroleum products. Verify that generating activities have obtained enough containers to properly segregate and store recoverable and unusable products and hazardous waste fuel by product type. (NOTE: Once the generating activity decides to discard the fuel rather than reuse, recover, or recycle it, the fuel is to be managed as hazardous waste.) Verify that the generating activity submits data on the quantity and identity of recoverable and unusable petroleum products, as required, to the designated installation environmental component of the program.

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BFMO (Base Fuels Management Office) (4) LFM (Liquid Fuels Maintenance) (5) BES (Bioenvironmental Engineering Services) (6) Base Fire Department (7) Power Production (8) AAFES (Army/Air Force Exchange Service) Service Station Manager (9) Generating Activities (10) Vehicle Maintenance Shop (11) Base Staff Judge Advocate

COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.8-5. BFMO must appoint a Fuels Environmental Coordinator (AFI 23-201, para 1.5).	Verify that BFMO has appointed a Fuels Environmental Coordinator. (3) Verify that the Fuels Environmental Coordinator carries out the following functions: - follows host nation laws on environmental protection and the policies contained in AFPDs and AFIs - consults with agencies (such as the EPC, Base Environmental Manager, BCE, BES, and SJA).
KO.8-6. BFMO must obtain and maintain certain equipment (AFI 23-201, para 1.14.1).	Verify that BFMO obtains and maintains a vehicle washrack equipped with an oil-water separator and located within or near the refueling unit parking area. (3) Verify that BFMO obtains and maintains a liquid degreasing machine capable of cleaning engines on mobile fueling equipment. Verify that the discharge from the degreaser drains into an oil-water separator.

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:

POL MANAGEMENT
 	
KO.8-7. All USFK installations must prepare, implement, and maintain plans that provide for the prevention, control, and reporting of all spills of POL and hazardous substances (FGS-ROK, Chapter 9, Criterion 3a and Chapter 18, Criteria 3a through 3e).
	Verify that the installation has, maintains, and implements a Spill Plan. (1)(2)(5)(6)
	
	Verify that the prevention portion of the spill plan includes, at a minimum:
	
	- name, title, responsibilities, duties, and telephone number of the designated person responsible for coordinating the response to POL and hazardous substances
	- general information on the installation, including:
	  - name
	  - type or function
	  - location and address
	  - charts of drainage patterns
	  - drains
	  - catch basins
	  - oil water separators
	  - wash rocks
	  - sewer lines
	  - designated water protection areas
	  - maps showing locations of facilities
	  - critical water resources
	  - land uses
	  - possible migration pathways
	- inventory list of all storage, handling, and transfer facilities that could possibly produce a significant spill of POL or hazardous substances; for each listing include:
	  - prediction of direction and rate of flow
	  - total quantity of POL or hazardous substance that might be spilled as a result of major failure
	- inventory of all POL and hazardous substances 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:
	  - operations to preclude spills of POL or hazardous substances
	  - inspections
	  - recordkeeping requirements.

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BFMO (Base Fuels Management Office) (4) LFM (Liquid Fuels Maintenance) (5) BES (Bioenvironmental Engineering Services) (6) Base Fire Department (7) Power Production (8) AAFES (Army/ Air Force Exchange Service) Service Station Manager (9) Generating Activities (10) Vehicle Maintenance Shop (11) Base Staff Judge Advocate

COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.8-7. (continued)	Verify that the control section of the plan contains:
	
	- specification of the responsibilities, duties, procedures, and resources to be used to contain and cleanup spills
	- description of immediate response actions, posted at all storage, handling, and disposal facilities
	- responsibilities, composition, and training requirements of the IRT
	- procedures for IRT alert and responses to include:
	  - access to a reliable communications system for timely notification of a POL or hazardous substance spill
	  - public affairs involvement
	- current roster of persons and alternates who must be notified of a spill, including:
	  - 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
	- procedure for notifying appropriate local authorities in the event of hazard to human health and the environment outside the installation
	- assignment of responsibilities for making notifications to emergency services providers
	- surveillance procedures for early detection of POL and hazardous substance spills
	- prioritized list of critical water resources to be protected, including on-installation wells
	- other resources available through prearranged agreements, including mutual aid agreements with ROK Fire Departments to cleanup or reclaim a large spill
	- cleanup methods, including procedures and techniques used to identify, contain, disperse, reclaim, and remove POL and hazardous substances
	- disposal procedures for contaminated POL, absorbent, or product
	- procedures to be accomplished prior to resumption of operations
	- description of general safety and fire prevention precautions for spill cleanup actions
	- public affairs section
	- an annual exercise of installation spill response actions
	- provisions for necessary training to ensure the effectiveness of personnel and equipment.

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.8-7. (continued)	Verify that, if the installation stores hazardous material and wastes in addition to POL, the contingency plan contains the following:
	
	- names and office telephone numbers of all individuals qualified to act as an emergency coordinator
	- arrangements with local hospitals, police and fire departments, contractors and emergency response teams
	- means to contact emergency services (i.e, phone numbers) on a 24-h basis
	- list of all emergency equipment at the facility and list and location of decontamination equipment, including the location and a physical description of each item on the list and a brief outline of its capabilities
	- an evacuation plan for personnel (where there is a possibility that evacuation would be needed) that includes:
	  - a description of the signal(s) used to begin evacuation
	  - evacuation routes
	  - alternate evacuation routes (where the primary route could be blocked by releases of hazardous waste or fires)
	  - a designated meeting place.
	
	Verify that, if the installation stores hazardous material and wastes in addition to POL, the contingency plan is updated at least annually or when there are significant changes to operations.
	
	Verify that the reporting section of the plan addresses the following:
	
	- recordkeeping when emergency procedures are implemented
	- a written report from the IOSC to appropriate USFK agencies in the following circumstances:
	  - when the spill cannot be contained inside a USFK installation and cannot be contained within any required berm or secondary containment
	  - when the spill exceeds 415 L (110 gal) of POL
	  - when a water resource has been polluted, or
	  - when the IOSC has determined that the spill is significant
	- notification of appropriate authorities (see checklist items KO.8-22 and KO.8-23).
	
	Verify that the contingency plan addresses each POL storage and distribution facility specifically.
	
	Verify that the plan is certified by a competent authority.
	
	Verify that the spill plan is updated at least once every 5 yr.
	
	Verify that, if the installation stores hazardous waste, the spill plan is updated every year.

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.8-8. Installations must provide for an annual exercise of installation spill response actions (FGS-ROK, Chapter 18, Criterion 3c(15)).	Verify that the installation provides for an annual exercise of installation spill response actions. Verify that the exercise is conducted at one of the following sites: - fuel dispensing station - POL storage area - heating oil transfer site - aboveground tank without secondary containment.

KO.8-9. Installations must post descriptions of immediate response actions at all storage, handling, and disposal facilities (FGS-ROK, Chapter 18, Criterion 3c(2)).	Verify that the installation has posted descriptions of immediate response actions at all storage, handling, and disposal facilities.
	
	Verify that the description is in a one-page, bilingual format that states:
	
	- immediately take action:
	  - evaluate health/safety risk
	  - extinguish flames
	  - attempt to stop the spill
	- immediately call help:
	  - call the Fire Department
	  - provide your name, telephone number, location, the incident, risk, and actions
	- continue spill response:
	  - secure site
	  - apply absorbents and/or containment
	  - remove spill material and/or waste.

KO.8-10. All fuels elements must be evaluated at least once each quarter (AFI 23-201, para 8.7).	Verify that the Quality Control and Inspection (QC&I) Supervisor evaluates each fuels element at least quarterly. (3) (NOTE: The QC&I function does not evaluate itself.) (NOTE: Locations that only have a ground fuels account are inspected semi-annually.) Verify that QC&I personnel or the Quality Assurance Evaluator (QAE) perform at least five no-notice spot checks each week. Verify that QC&I personnel or the QAE spot check all shifts. Verify that spot checks are conducted during exercises and contingencies. (NOTE: Installations with fewer than 20 full-time fuels personnel may conduct as few as two spot checks per week.)

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.8-11. Facilities and equipment for storing, handling, or using oils should be designed to prevent or minimize spills to the environment and should be periodically tested and inspected (MP).	Verify that one of the following preventive systems, or an equivalent, is used: (1)(4)(5) - absorbent material - sand bags/temporary curbing devices - dikes, berms, or retaining walls sufficiently impervious to contain spilled oil - culverting gutters or other drainage system - weirs, booms, or other barriers - spill diversion ponds - retention ponds. Verify that each oil storage area: - has adequate supplies of appropriate materials that are readily accessible - has equipment that is in good condition.
KO.8-12. The materials and equipment needed to manage a spill should be readily available (MP).	Verify that materials and equipment needed to manage a spill as specified in the plan are readily available, including, for example: (1)(2)(3)(4)(5)(6)(7)(8)(9)(10) - respiratory protection - absorbents - ear/eye protection - spill kits - protective clothing - neutralizers.
KO.8-13. Secondary containment must be provided for all loading and unloading facilities (AFI 23-201, para A11.1).	Verify that all loading and unloading facilities have secondary containment that is impermeable to petroleum products. (3)
PIPELINES	
KO.8-14. Air Force operated offsite pipelines should be inspected at least once per week by air patrol, and once a year by line walker or vehicle patrol (MP).	Verify that records confirm that inspections were performed. (1)(3)(4) Verify that any detected leaks were reported and leaking pipes repaired or replaced. (NOTE: This MP is based on guidance found in AFM 85-16, Chapter 8.)

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.8-15. All Air Force operated above and underground fuel piping systems at transfer operations, pumping and in-plant processing operations should be managed according to specific parameters (MP).	Verify that pressure tests have been conducted once a year. (3)(4)(7) (NOTE: Check under remarks Section of AF Form 172 if the testing pressure was maintained during the 2 h period.) Verify that confirmed leaks have been reported and leaking pipes repaired or replaced. Verify that pipelines are walked at least twice a year and that any suspicious circumstances lead to immediate investigation to include pressure testing of the line and excavation if soil conditions permit. (NOTE: This MP is based on guidance outlined in AFM 85-16, Chapter 8.)
KO.8-16. All underground aviation fuel transfer pipelines should be subject to a hydrostatic pressure test on a 5-yr recurring basis (MP).	Verify that hydrostatic pressure tests were conducted as required by reviewing attachments to AF Form 172 and interviewing LFM personnel. (4). Verify that detected leaks were corrected through repair or replacement by inspecting test results. Verify that 150 percent of normal pressure was maintained during the 4-h test period by reviewing the Remarks section of AF Form 172. (NOTE: This MP is based on guidance outlined in AFM 85-16, Chapter 8.)
KO.8-17. Buried fuel piping should have a protective wrapping and coating and should be cathodically protected if soil conditions warrant (MP).	Verify that buried fuel piping is properly protected from corrosion. (3)(4)(7) Verify that the voltage is greater than -0.85 V, but not more than -3.0 V (monthly), for impressed current systems. Verify that the voltage is greater than -0.85 V, but not more than -3.0 V (biannually), for sacrificial anode systems. Verify that leak detection and failure are reported.
KO.8-18. All pipeline facilities with a construction start date after 1 October 1994 must be designed and constructed to meet recognized U.S. industry standards (FGS-ROK, Chapter 9, Criterion 3e).	Verify that all pipeline facilities with a construction start date after 1 October 1994 are designed and constructed to meet recognized U.S. industry standards. (3)(4)(7)

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.8-19. All pipeline facilities carrying POL must be tested and maintained in accordance with recognized U.S. industry standards (FGS-ROK, Chapter 9, Criterion 3d).	Verify that all pipeline facilities carrying POL are tested and maintained in accordance with recognized U.S. industry standards. (3)(4)(7) Verify that each pipeline operator handling POL prepares and follows a procedural manual for operations, maintenance, and emergencies. Verify that each new pipeline system and each system in which pipe has been replaced or relocated is hydrostatically tested, in accordance with recognized U.S. industry standards, and is without leakage.
DISCHARGES/SPILLS	(NOTE: The organization responsible for causing a spill will be responsible for reimbursement of costs associated with spill response and associated cleanup.)
KO.8-20. Installations must not discharge POL in any form into or upon the waters or shoreline of the ROK or any POL that may affect natural resources of the ROK (FGS-ROK, Chapter 9, Criterion 3b(5)).	Verify that the installation does not discharge POL in any form into or upon the waters or adjoining shoreline, or any POL that may affect the natural resources of the ROK. Verify that the installation spill plan provides for the prevention, control, and reporting of all POL discharges.
KO.8-21. Installations must take specific actions in the event of POL spills (FGS-ROK, Chapter 9, Criterion 3f).	Verify that the installation follows the guidance in the Spill Plan. (1) Verify that, when there is a spill, the immediate response involves: - eliminating any sources of ignition - stopping the leak at the source - controlling the migration of the spill - calling for help - preventing personal injury. Verify that follow-up steps include: - 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.

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COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.8-22. Installations must make specific notifications in the event of POL or hazardous substance spills (FGS-ROK, Chapter 18, Criteria 3e(2), 3e(4), and 3e(5)(b) and 3e(5)(d)).	Verify that spills of RQs of POL or hazardous substance are reported to the IOSC immediately. (1)(2)(3)(4)(5)(6) Verify that immediate action is taken to eliminate the source and contain the spill. Verify that the IOSC immediately notifies: - the appropriate Military Department and/or Defense Agency - the USFK Assistant Chief of Staff, Engineer. Verify that the reporting criteria for the spill report are in accordance with USFK Regulation 703-1. Verify that, when a POL or hazardous substance spill occurs outside the installation or inside the installation and cannot be contained within its boundaries, or threatens a ROK drinking water resource, the following are notified: - the facility/base engineer - the USFK PAO or Command Center (CC)-Seoul (after working hours) - the appropriate ROK authorities.
KO.8-23. Installations must take specific actions in the event of POL or hazardous substance spills that occur inside a USFK installation and cannot be contained within its boundaries, threaten a ROK drinking water resource, or occur off-post (FGS-ROK, Chapter 18, Criteria 3e(5) and 3e(6)).	Verify that the unit that caused the spill takes immediate action to contain the damage and cleanup within the limits of their capabilities. Verify that the facility/base engineering work force serves as the primary responder. Verify that the PAO and the Chief, Public Information, CC-SEOUL assist the installation commander in informing local government officials of the incident. Verify that the USFK response to off-post spills/damages is limited to notification actions, spill control, collection of standing product, and fire prevention. (NOTE: Under the provisions of Article XXIII of the US-ROK Status of Forces Agreement (SOFA), claims by local national individuals or organizations for damages arising from off-installation spills will be handled through established claims procedures.)

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
USED POL / WASTE POL	
KO.8-24. BFMO has specific responsibilities with regard to the management of waste fuel (AFI 23-201, para A11.2).	Verify that BFMO: (3) - designates interim storage and final disposition locations and procedures for off-specification bulk products and product-water mixtures under fuels management control - does not use installed hydrants, storage sumps, or slop tanks to collect or store waste fuels - obtains written MAJCOM approval to use stock listed vehicles and trailers for the collection and transport of waste fuels or oils - clearly marks and completely isolates the tanks and equipment used for waste products from active product storage and equipment to prevent contamination - ensures that there is direct supervision when waste materials are delivered to waste product tankage in the fuels area by the generating activity.

KO.8-25. Installations that burn used oil may do so in certain devices only (FGS-ROK, Chapter 6, Criterion 3i(1)).	Verify that used oil fuel is burned in the following devices only: (1)(2)(5)
	- industrial furnaces
	- industrial boilers located on 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, heated or cooled air, or other gases or fluids
	- used-oil-fired space heaters if the following conditions are met:
	  - the heat burns only used oil that the installation generates
	  - the heater is designed to have a maximum capacity of not more than 0.5 MBtu/h [0.147 MW]
	  - the combustion gases from the heater are properly vented to the ambient air.

KO.8-26. Neither used oil nor used oil contaminated with any hazardous waste may be used for dust suppression or road treatment (FGS-ROK, Chapter 6, Criterion 3i(2)).	Verify that the installation does not use used oil for dust suppression or road treatment. (1)

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COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.8-27. Installations that use lubricant as recycled fuel must meet specific requirements (FGS-ROK, Chapter 6, Criterion 3i(3)).	Verify that the installation meets the requirements for refining waste oil facilities, equipment, and technical ability listed in Table 8-1.
KO.8-28. Accumulation points must be set up for used petroleum products generated as part of the operation and maintenance of air-to-surface weapons ranges (AFI 13-212, para 1.10.2.1).	Determine whether the installation operates air-to-surface weapons ranges that generate used petroleum products. (1)(3)(5) Verify that accumulation points have been set up for such weapons ranges. Verify that arrangements have been made for periodic transport of such products to a storage facility.
KO.8-29. Installations that generate used oil and market it directly to a burner should meet specific standards (MP).	Verify that the installation prepares and sends the receiving facility an invoice detailing the following for off-specification used oil: (1)(2)(5)(8)(10) - an invoice number - the names and addresses of the shipping and receiving facilities - the quantity of off-specification oil to be delivered - the dates of shipment or delivery. Verify that copies of the invoices are kept for 3 yr. Verify that, for used oil that is not off-specification, copies of the waste analyses are kept for 3 yr. Verify that the installation has a signed notice from the burner that the oil will be burned only in approved furnaces and/or boilers.

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Table 8-1

Requirements for Refining Waste Oil Facilities, Equipment, and Technical Ability

(FGS-ROK Table 6-1)

Refining Facility Equipment	Technical Ability
a. Refining facility that disposes of 20 kg/day [≈45 lb/day] or more waste oil, appropriate to the following criteria:	1 or more waste disposal, air disposal, water environmental, or chemical engineers (Grade I)
1. Remaining carbon: 8 percent or less by the weight ratio	
2. Water and Sediment: 1 percent or less by the volume ratio	
3. Ash content: 1.5 percent or less by the weight ratio	
4. Sulfur content: 1 percent or less by the weight ratio	
5. Cadmium and its compounds: 2 ppm or less by the weight ratio	
6. Lead and its compounds: 100 ppm or less by the weight ratio	
7. Chromium and its compounds: 10 ppm or less by the weight ratio	
8. Arsenic and its compounds: 5 ppm or less by the weight ratio	
b. Storage facility whose size can store waste oil and refined oil for 30 days or more.	

INSTALLATION:	COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANT MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 9

SOLID WASTE MANAGEMENT

Korea ECAMP

SECTION 9

SOLID WASTE MANAGEMENT

A. Applicability of this Section

This section addresses the collection, storage, and disposal of solid waste on Air Force (AF) installations. Solid waste is considered to be nonhazardous trash, rubbish, garbage, bulky wastes, liquids, or sludges generated by any AF installation operations and activities. This section also addresses the management of medical/pathological waste. The handling and disposal of asbestos waste materials are addressed in Section 11, *Toxic Substances Management.*

Recycling and resource recovery activities are also included in this section because this form of solid waste management is required by Department of Defense (DOD) and U.S. Air Force (USAF) directives.

The regulatory requirements in this section are based on DOD regulations and Air Force Policy that apply at overseas installations. Management Practices (MPs) are nonregulatory but are important to follow to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 7, includes criteria concerning the identification, classification, collection, transportation, storage, treatment, and safe disposal of solid waste. Chapter 8 addresses the management of medical waste.

- DOD Directive (DODD) 4165.60, *Solid Waste Management*, 1 October 1976, provides guidance and direction to all DOD facilities relative to solid waste collection, disposal, material recovery, and recycling in agreement with the *Solid Waste Disposal Act* (SWDA).

C. U.S. Air Force Documents

- No additional documents.

D. Responsibility for Compliance

- Base Civil Engineering (BCE) is responsible for site location, licensing, construction, and operation of onbase landfills and for the storage and transportation of solid wastes to either onbase or offbase disposal activities.

- Bioenvironmental Engineering Services (BES) is responsible for reviewing and coordinating asbestos disposal plans and operations.

E. Definitions

- *Animal Waste* - contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including that produced in veterinary facilities), production of biologicals, or testing of pharmaceuticals. Carcasses of road kill, euthanized animals, animals dying of natural causes, and waste produced by general veterinary practices are not considered animal waste (FGS-ROK, Chapter 8, Definitions).

- *Blood and Blood Products* - any of the following (FGS-ROK, Chapter 8, Definitions):
  1. free flowing liquid or semi-liquid human blood, plasma, serum, and other blood derivatives that are waste
  2. items such as gauze or bandages that are saturated or dripping with human blood, including those items produced in dental procedures such as saliva soaked gauze or cotton rolls
  3. items caked with dried blood and capable of releasing the blood during normal handling procedures.

- *Bottom Ash* - the solid material that remains on a hearth or falls off the grate after thermal processing is complete (DODD 4165.60, para V(A)).

- *Bulk 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 waste collection, processing, or treatment methods (FGS-ROK, Chapter 7, Definitions).

- *Carry-out Collection* - collection of solid waste from a storage area proximate to the dwelling unit(s) or establishment where generated (FGS-ROK, Chapter 7, Definitions).

- *Cell* - compacted solid wastes that are enclosed by natural soil or cover material in a land disposal site (FGS-ROK, Chapter 7, Definitions).

- *Centers for Disease Control (CDC) Risk Group IV Waste* - (also *isolation waste*) biological waste and discarded materials contaminated with blood, excretion exudates, or secretions from humans who are isolated to protect others from highly communicable diseases, or isolated animals known to be infected with highly communicable diseases caused by agents designated in Table 9-1. This category includes pox viruses and arboviruses (FGS-ROK, Chapter 8, Definitions).

- *Class A Compost* - compost that contains average contaminant levels no greater than the following levels (FGS-ROK, Chapter 7, Criterion 3p(1)):

Contaminant	Allowable Average Concentration, mg/kg
Polychlorinated biphenyls (PCBs)	1
Cadmium	10
Chromium	1000
Copper	500
Lead	500
Mercury	5

Contaminant	Allowable Average Concentration, mg/kg
Nickel	100
Zinc	1000

- *Class B Compost* - compost that fails to meet the standards for Class A Compost (FGS-ROK, Chapter 7, Criterion 3p(2)).

- *Closed Landfill* - a sanitary landfill where all cells have been completely utilized and the disposal of solid waste has ended, and which the owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements (FGS-ROK, 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-ROK, Chapter 7, Definitions).

- *Collection Frequency* - the number of times collection is provided in a given period of time (FGS-ROK, Chapter 7, Definitions).

- *Commercial Solid Waste* - all types of solid wastes generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes (FGS-ROK, Chapter 7, Definitions).

- *Compactor Collection Vehicle* - a vehicle with an enclosed body, containing mechanical devices, that conveys solid waste into the main compartment of the body and compresses it into a smaller volume of greater density (FGS-ROK, Chapter 7, Definitions).

- *Composting* - the controlled biological decomposition of organic solid waste under aerobic conditions (FGS-ROK, Chapter 7, Definitions).

- *Construction and Demolition Waste* - the waste building materials, packaging, and rubble resulting from construction, alteration, remodeling, repair, and demolition operations on pavements, houses, buildings, and other structures (FGS-ROK, Chapter 7, Definitions).

- *Cover Material* - that is material used to cover compacted solid wastes in a land disposal site (FGS-ROK, Chapter 7, Definitions).

- *Cultures, Stocks, and Vaccines* - cultures and stocks of infectious agents and associated biologicals, including: cultures from medical/pathological and water/wastewater laboratories, discarded live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate, and mix cultures (FGS-ROK, Chapter 8, Definitions).

- *Curb Collection* - collection of solid waste placed adjacent to a street (FGS-ROK, Chapter 7, Definitions).

- *Daily Cover* - cover material that is spread and compacted on the top and side slopes of compacted solid wastes at least at the end of each operating day in order to control vectors, fire, moisture, and erosion and to assure an aesthetic appearance (40 CFR 241.101 as adopted by DODD 4165.60, para V(A)).

  (NOTE: In addition to the above definition, 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-ROK, Chapter 7, Definitions).)

- *Disposal* - the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater (FGS-ROK, Chapter 7, Definitions).

- *Existing Landfill* - a sanitary landfill that is in existence, operation, or both. An existing landfill may be divided into cells for operation, planning, and management purposes (FGS-ROK, Chapter 7, Definitions).

- *Failed or Failing Landfill* - a sanitary landfill from which the ground- or surface water is being polluted and consequently causing noncompliance with pollution control standards or regulations, or both (FGS-ROK, Chapter 7, Definitions).

- *Final Cover* - cover materials that serve the same function as daily cover but, in addition, may be permanently exposed on the surface (FGS-ROK, Chapter 7, Definitions).

- *Fly Ash* - suspended particles, charred paper, dust, soot, and other partially oxidized matter carried in the products of combustion (40 CFR 240.101 as adopted by DODD 4165.60, para V(A)).

- *Food Waste* - the organic residues generated by the handling, storage, sale, preparation, cooking, and serving of foods, commonly called garbage (FGS-ROK, Chapter 7, Definitions).

- *Generation* - the act or process of producing solid waste (FGS-ROK, Chapter 7, Definitions).

- *Government-Furnished Materials* - materials furnished to government contractors pursuant to the execution of government contracts as defined in the Federal Acquisition Regulations 17.345(b) (FGS-ROK, Chapter 7, Definitions).

- *Groundwater* - water present in the unsaturated zone of an aquifer (40 CFR 241.101 as adopted by DODD 4165.60, para V(A)).

- *High-grade Paper* - letterhead, dry copy paper, miscellaneous business forms, stationery, typing paper, tablet sheets, and computer printout paper and cards commonly sold as white ledger, computer printout, and tab card grade by the wastepaper industry. High-grade paper is included in the commercial solid waste category (FGS-ROK, Chapter 7, Definitions).

- *Household Hazardous Waste* - wastes resulting from products purchased by the general public for household use that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may pose a substantial known or potential hazard to human health or the environ-

ment when improperly treated, disposed of, or otherwise managed (FGS-ROK, Chapter 7, Definitions).

- *Industrial Solid Waste* - solid waste generated by industrial processes and manufacturing (FGS-ROK, Chapter 7, Definitions).

- *Institutional Solid Waste* - solid waste generated by educational, health care, correctional, and other institutional facilities (FGS-ROK, Chapter 7, Definitions).

- *Integrated Solid Waste Management (ISWM)* - ISWM is designed to minimize the initial input to the waste stream through source reduction, reduce the volume of the waste stream requiring treatment or disposal through re-use and recycling, and finally disposal or treatment of solid waste through the effective combination of incineration, composting, and landfill disposal (FGS-ROK, Chapter 7, Definitions).

- *Intermediate Cover* - cover material that serves the same function as daily cover but must resist erosion for a longer period of time because it is applied in areas where additional cells are not to be constructed for extended periods of time (40 CFR 241.101 as adopted by DODD 4165.60, para V(A)).

- *Land Application Unit* - an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment or disposal (FGS-ROK, Chapter 7, 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-ROK, Chapter 6, Definitions).

- *Large Volume Waste Generator* - anyone who produces more than 300 kg/day of refuse. This facility is responsible for its own refuse (FGS-ROK, Chapter 7, Definitions).

- *Leachate* - liquid that has percolated through solid waste and has extracted dissolved or suspended materials from it (FGS-ROK, Chapter 7, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Medical Waste Generator* - any water/wastewater laboratory, medical, dental, or veterinary activity that generates regulated medical waste (RMW) (FGS-ROK, Chapter 8, Definitions).

- *Medical Waste Treatment* - any method, technique, or process designed to render RMW noninfectious (FGS-ROK, Chapter 8, Definitions).

- *Municipal Solid Waste (MSW)* - normally, residential and commercial solid waste generated within a community, not including yard waste (FGS-ROK, Chapter 7, Definitions).

- *Municipal Solid Waste Management Facility (MSWMF)* - any of the following facilities are considered MSWMF (FGS-ROK, Chapter 7, Definitions):
    1. a landfill: a discrete area of land or an excavation, on or off the installation, that receives household waste and that is not a land application unit, surface impoundment, injection well,

or waste pile. A landfill unit also may receive other types of wastes, such as commercial solid waste and industrial waste
2. an incineration facility
3. a compaction facility, a shredding facility, or transfer facility of MSW in order to facilitate transportation
4. a facility the main function of which is to recycle MSW by classifying or treating the waste so that it may be used as compost, animal feed, fuel, etc.

- *New Landfill* - a sanitary landfill that is not designed as a part of the initial plan of an existing landfill or is newly created without an existing landfill contiguous to it. Any natural or man-made boundaries, for example, surface waters, roads, railroads, adjoining the existing landfill, will not preclude the status of contiguity (FGS-ROK, Chapter 7, Definitions).

- *Nonregulated Medical Waste* - solid material intended for disposal that is produced as the direct result of patient diagnosis, treatment, or therapy. Typically such waste is generated in patient sleeping rooms, treatment or therapy rooms, isolation rooms (except where the patient is isolated for a CDC Risk Group IV Waste, rooms used for diagnostic procedures, doctors' offices, and nursing units. Examples of items included in this category are soiled dressings, bandages, disposable catheters, swabs, used disposable drapes, gowns, masks and gloves, empty used specimen containers and blood tinged gauze, sponges, or chux. This waste requires no further treatment and will be disposed of as general waste (FGS-ROK, Chapter 8, Definitions).

- *Office Waste* - solid waste generated in buildings or rooms in which the affairs of business, professional persons, or branches of government, are carried on. Excluded is waste generated in cafeterias, snack bars, or other food preparation and sales areas, and medical waste (FGS-ROK, Chapter 7, Definitions).

- *Open Burning* - burning of solid wastes in the open, such as in an open dump (FGS-ROK, Chapter 7, Definitions).

- *Open Dump* - a land disposal site at which solid wastes are disposed of in a manner that does not protect the environment, are susceptible to open burning, and are exposed to the elements, vectors, and scavengers (FGS-ROK, Chapter 7, Definitions).

- *Pathological Waste* - human pathological wastes, including tissues, organs, body parts, extracted human teeth not returned to patients, and body fluids that are removed during surgery, autopsy, or other medical procedures, and specimens of body fluids (FGS-ROK, Chapter 8, Definitions).

- *Qualifying Recycling Programs (QRPs)* - organized operations that require concerted efforts to divert or recover scrap or waste from waste streams; or identify, segregate, and maintain the integrity of the recyclable materials to maintain or enhance the marketability of the materials (FGS-ROK, Chapter 7, Definitions).

- *Recoverable Resources* - materials that have useful physical or chemical properties after serving their original purposes. Recoverable resources can be reused or recycled for the same or for other purposes (FGS-ROK, Chapter 7, Definitions).

- *Recyclable Materials* - includes materials diverted from the solid waste stream and the beneficial use of such materials. Recycling is further defined as the result of a series of activities by which materials that would become or otherwise remain waste are diverted from the solid waste stream by

collection, separation, and processing and are used as raw materials in the manufacture of goods sold or distributed in commerce or the reuse of such materials as substitutes for goods made of virgin materials. Examples of recyclable materials include (but are not limited to): paper, food waste, plastic, glass, all cardboard and other packaging materials, newspapers, and empty food and beverage containers. Recyclable materials also include scrap (including ferrous and nonferrous scrap) and firing range expended brass and mixed metals gleaned from firing range cleanup that do not require demilitarization. Items requiring demilitarization or mutilation prior to sale are not recyclable materials. For the purposes of FGS-ROK, the following materials are not recyclable materials and will not be sold through a QRP: precious metals; government furnished materials; hazardous waste (including household hazardous waste); machine parts; electrical components; unopened containers of unused oil, solvents, or paints; and repairable items that have not progressed through the disposal cycle (FGS-ROK, Chapter 7, Definitions).

- *Recycling* - the series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products other than fuel for producing heat or power by combustion (FGS-ROK, Chapter 7, Definitions).

- *Regulated Medical Waste (RMW)* - waste that is potentially capable of causing disease in humans and may pose a risk to both individuals or community health if not handled or treated properly. Consists of the following classes of waste: cultures, stocks and vaccines; pathological waste; blood and blood products; all used and unused sharps; animal waste; and CDC Risk Group IV Waste. Liquid human blood, plasma and other derivatives whether dried, dripping, or free flowing are considered in this category (FGS-ROK, Chapter 8, Definitions).

- *Residential Solid Waste* - the wastes generated by the normal activities of households, including, but not limited to, food wastes, rubbish, ashes, and bulky wastes (FGS-ROK, Chapter 7, Definitions).

- *Resource Recovery* - the process of obtaining materials or energy from solid waste or used petroleum, oil, and lubricant (POL) product (FGS-ROK, Chapter 7, Definitions).

- *Resource Recovery Facility* - any physical plant that processes residential, commercial, or institutional solid waste, biologically, chemically, or physically, and recovers useful products, such as shredded fuel, combustible oil or gas, steam, metal, glass, etc., for resale or reuse (DOD Directive 4165.60, Enclosure 2, J and FGS-ROK, Chapter 7, Definitions).

- *Reuse* - the use of a product more than once in its same form for the same purpose; e.g., a soft-drink bottle is reused when it is returned to the bottling company for refilling (FGS-ROK, Chapter 7, Definitions).

- *Rubbish* - a general term for solid waste, excluding food wastes and ashes, taken from residences, commercial establishments, and institutions (FGS-ROK, 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-ROK, Chapter 7, Definitions).

- *Satellite Vehicle* - a small collection vehicle that transfers its load into a larger vehicle operating in conjunction with it (FGS-ROK, Chapter 7, Definitions).

- *Scavenging* - the uncontrolled and unauthorized removal of materials at any point in the solid waste management system (FGS-ROK, Chapter 7, Definitions).

- *Service Solid Waste Management Manual* - Air Force Regulation (AFR) 91-8 [replaced by Air Force Instruction (AFI) 32-7042] (FGS-ROK, Chapter 7, Definitions).

- *Site Footprints* - original dimensions of the sanitary landfill (existing or closed) (FGS-ROK, Chapter 7, Definitions).

- *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-ROK, Chapter 7, Definitions).

- *Solid Waste* - garbage, refuse, sludge, and other discarded materials, including solid, semisolid, liquid, and contained gaseous materials resulting from institutional, industrial, commercial, mining, agricultural, or community operations and activities. Solid wastes are either discarded or accumulated, stored, or treated prior to being discarded. Infectious wastes are not included in this category for purposes related to recycling. A material is discarded if it is abandoned (and not used, reused, reclaimed, or recycled) by being disposed of, burned, or not treated. 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-ROK, Chapter 7, Definitions).

- *Solid Waste Storage Container* - a receptacle used for the temporary storage of solid waste while awaiting collection (FGS-ROK, Chapter 7, Definitions).

- *Source Reduction* - source reduction programs can reduce the volume of the solid waste stream. Reducing the amount of material that reaches the installation and will require disposal is an effective and efficient means to reduce solid waste volume. Consideration should be given to how items are packaged when choosing products. The minimum packaging that will ensure safe arrival and meet installation storage and handling needs should be selected (FGS-ROK, Chapter 7, Definitions).

- *Source Separation* - the separation of materials at their point of generation by the waste generator (FGS-ROK, Chapter 7, Definitions).

- *Stationary Compactor* - a powered machine that is designed to compact solid waste or recyclable materials, and which remains stationary when in operation (FGS-ROK, Chapter 7, Definitions).

- *Storage* - the interim containment of solid waste after generation and prior to collection for ultimate recovery or disposal (FGS-ROK, Chapter 7, Definitions).

- *Street Wastes* - material picked up by manual or mechanical sweepings of alleys, streets, and sidewalks, wastes from public waste receptacles, and material removed from catch basins (FGS-ROK, Chapter 7, Definitions).

- *Thermal Processing* - processing of waste material by means of heat (40 CFR 240.101 as adopted by DODD 4165.60, para V(A)).

- *Transfer Station* - a site at which solid wastes are concentrated for transport to a processing facility or land disposal site. A transfer station may be fixed or mobile (FGS-ROK, Chapter 7, Definitions).

- *Treatment* - any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any solid waste (FGS-ROK, Chapters 6 and 7, Definitions).

- *Used and Unused Sharps* - sharps that have been used in animal or human patient care or treatment in medical, research, or support laboratories, including hypodermic needles, syringes (with or without the attached needle), pasteur pipettes, scalpel blades, blood collection tubes and vials, test tubes, needles attached to tubing, and culture dishes (regardless of the presence of infectious agents). Other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips, are also included in this category (FGS-ROK, Chapter 8, Definitions).

- *Vector* - a carrier, usually an arthropod, that is capable of transmitting a pathogen from one organism to another (FGS-ROK, Chapter 7, Definitions).

- *Working Face* - that portion of the land disposal site where solid wastes are discharged and are spread and compacted prior to the placement of cover material (40 CFR 241.101 as adopted by DODD 4165.60, para V(A)).

- *Yard Waste* - grass and shrubbery clippings, tree limbs, leaves, and similar organic materials commonly generated in residential yard maintenance (also known as green waste) (FGS-ROK, Chapter 7, Definitions).

SOLID WASTE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.9-1 through KO.9-6	(1)(2)(4)
Recycling	KO.9-7 through KO.9-11	(1)(2)(3)
Solid Waste Storage and Collection	KO.9-12 through KO.9-23	(1)(2)(3)
Land Disposal Sites		
Specific Wastes	KO.9-24 through KO.9-27	(1)(2)(3)
Operations	KO.9-28 through KO.9-42	(1)(2)(3)
Closure and Post-Closure	KO.9-43 through KO.9-46	(1)(2)(3)
New Landfills	KO.9-47 through KO.9-49	(1)(2)(3)
Thermal Processing Facilities	KO.9-50 through KO.9-63	(1)(2)(3)
Resource Recovery Facilities	KO.9-64 and KO.9-65	(1)(2)(3)
Composting Facilities	KO.9-66 and KO.9-67	(1)(2)(3)
Open Dumping	KO.9-68	(1)(2)
Large Volume Waste Generators		
Collection/Transportation	KO.9-69 and KO.9-70	(1)(2)
Disposal	KO.9-71 through KO.9-75	(1)(2)
Medical Waste		
General	KO.9-76	(1)(3)
Generation	KO.9-77 through KO.9-81	(1)(3)
Transport	KO.9-82	(1)(3)
Storage	KO.9-83 through KO.9-85	(1)(3)
Treatment and Disposal	KO.9-86 through KO.9-93	(1)(3)
Spills	KO.9-94 and KO.9-95	(1)(3)
Training	KO.9-96 and KO.9-97	(1)(3)

(a) CONTACT/LOCATION CODE:

(1) BEC (Base Environmental Coordinator)
(2) BCE (Base Civil Engineer)
(3) BES (Bioenvironmental Engineering Services)
(4) Base Staff Judge Advocate

SOLID WASTE MANAGEMENT

Records To Review

- Record of current nonhazardous solid waste management practices
- Documentation of locations (map) and descriptions of all nonhazardous waste treatment, storage, and disposal facilities (TSDFs)
- Records of operational history of all active and inactive TSDFs
- 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

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

Sources To Interview

- BEC (Base Environmental Coordinator)
- BCE (Base Civil Engineer)
- BES (Bioenvironmental Engineering Services)
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ALL INSTALLATIONS	(NOTE: Installations have the right to cooperate with ROK officials, consistent with Article VI of the US-ROK Status of Forces Agreement (SOFA), in the use of trash and garbage removal services that are owned, controlled, or regulated by the government of the ROK or local administrative subdivisions thereof.)
KO.9-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.9-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(2)(4) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - DODD 4165.60, *Solid Waste Management--Collection, Disposal, Resource Recovery, and Recycling Program,* 4 October 1976. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee (EPC).
KO.9-3. Installations must meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as the basis of the finding).	Determine whether any new regulations concerning solid waste management have been issued since the finalization of the manual. (1)(2)(4) Verify that the installation is in compliance with newly issued regulations.
KO.9-4. Installations must develop and implement a solid waste management strategy (FGS-ROK, Chapter 7, Criterion 3c).	Verify that the installation has developed and implemented a strategy for reducing solid waste disposal. (1)(2) (NOTE: This strategy could include recycling, composting, and waste minimization efforts.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-5. Buildings and all other facilities that are constructed, modified, or leased after the effective date of the FGS-ROK must provide for storage areas that can be easily cleaned and maintained and that allow for safe and efficient collection of solid waste (FGS-ROK, Chapter 7, Criterion 3f).	Verify that buildings and facilities in the design phase will have appropriate solid waste storage areas. (1)(2)
KO.9-6. Installations must not use open burning as the regular method of solid waste disposal (FGS-ROK, Chapter 7, Criterion 3n).	Verify that open burning is not the installation's regular method of solid waste disposal. (1)(2) Verify that, if burning is the disposal method of choice, the installation uses incinerators that meet applicable air quality standards. (NOTE: For air quality standards, see Section 1, *Air Emissions Management.*)
RECYCLING	
KO.9-7. AF installations must institute recycling programs, where cost effective, and must reduce the volume of solid waste materials at the source (FGS-ROK, Chapter 7, Criterion 3i; DODD 4165.60, para V(A), V(C), and V(D)).	Verify that a solid waste reduction/resource recovery program exists. (1)(3) Verify that efforts are made to reduce the volume of solid waste materials at the source.
KO.9-8. Reusable and marketable materials should be collected at regular intervals (MP).	Verify that reusable or marketable materials are collected at regular intervals. (1)(3)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-9. Installations with office facilities of over 100 office workers must recover high-grade paper (DODD 4165.60, para V(L)).	Determine whether the installation has over 100 office workers. (1)(3) Verify that high-grade paper is separated at the source of generation. Verify that high-grade paper is separately collected. Verify that high-grade paper is sold for recycling.
KO.9-10. Installations where more than 500 families reside must recycle newspapers (DODD 4165.60, para V(J)).	Determine whether the installation has more than 500 families residing on it. (1)(3) Verify that used newspapers are separated at the source of generation. Verify that used newspapers are separately collected. Verify that used newspapers are sold for recycling.
KO.9-11. Installations that generate 10,160 kg (10 tons) or more of waste corrugated containers per month must sell this material for recycling (DODD 4165.60, para V(K)).	Determine whether the installation generates 10,160 kg (10 tons) or more of waste corrugated containers per month. (1)(2)(3) Verify that waste corrugated containers are collected separately. Verify that waste corrugated containers are sold for recycling. (NOTE: Alternatively, waste corrugated containers may be used as an energy resource.)
SOLID WASTE STORAGE AND COLLECTION	
KO.9-12. Installations must treat, store, and dispose of USFK solid wastes in facilities that meet specific criteria (FGS-ROK, Chapter 7, Criterion 3a).	Verify that the installation treats, stores, and disposes of USFK solid wastes in facilities that meet the criteria of FGS-ROK, Chapter 7, to the maximum extent practical. (1)(2)(3)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-13. Installations must use solid waste storage containers that meet specific design standards (FGS-ROK, Chapter 7, Criterion 3g).	Verify that storage containers are leakproof, waterproof, and vermin-proof, including sides, seams, and bottoms. (2)(3) Verify that storage containers are durable enough to withstand anticipated usage without rusting, cracking, or deforming in a manner that would impair serviceability. Verify that storage containers have functional lids.
KO.9-14. Installations must store containers in accordance with specific requirements (FGS-ROK, Chapter 7, Criterion 3h).	Verify that containers are stored on a firm, level, well-drained surface that is large enough to accommodate all of the containers. (2)(3) Verify that the storage area is clean and free of spills.
KO.9-15. Installations must store all solid wastes and materials separated for recycling according to specific guidelines (FGS-ROK, Chapter 7, Criterion 3d and DODD 4165.60, para V(A)).	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. (1)(2)(3) Verify that such materials are contained or bundled to prevent spillage. Verify that all solid waste containing food wastes is stored in covered or closed containers that are nonabsorbent, leakproof, durable, easily cleaned, and designed for safe handling. Verify that solid waste containers are of an adequate size and number to contain all waste generated between collections. Verify that reusable containers are capable of being serviced without the collector coming into contact with the waste.
KO.9-16. Installation personnel should be periodically informed about materials that may not be put in solid waste receptacles (MP).	Verify that a program exists at the installation to keep personnel informed about proper waste disposal practices. (1)(2)(3)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-17. All installations must operate their collection systems in such a way as to protect the health and safety of personnel associated with the operation (DODD 4165.60, para V(A)).	Verify that the collection system is operated safely. (1)(2)(3)
KO.9-18. Installations must maintain collection equipment according to certain standards if such equipment is considered to be operating in interstate or foreign commerce (DODD 4165.60, para V(A)).	Verify that all such vehicles used for the collection and transportation of solid waste meet all applicable standards established by the Federal Government, including: (1)(2)(3) - Motor Carrier Safety Standards (49 CFR 390 through 396) - Noise Emission Standards for Motor Carriers Engaged in Interstate Commerce (40 CFR 202) - Federal Motor Vehicle Safety Standards (49 CFR 500 through 580) (Federally owned collection equipment only).
KO.9-19. All collection equipment must meet specific standards (DODD 4165.60, para V(A)).	Verify that all vehicles used for collection and transportation of solid wastes or materials separated for recycling are enclosed and have suitable covers to prevent spillage. (2)(3) Verify that equipment used in the compaction, collection, and transportation of solid waste or materials separated for recycling is constructed, operated, and maintained adequately. Verify that the following types of equipment meet the standards established by the American National Standards Institute: - rear-loading compaction equipment - side-loading compaction equipment - front-loading compaction equipment - tilt-frame equipment - hoist-type equipment - satellite vehicles - special collection compaction equipment - stationary compaction equipment.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-20. All installations must collect solid wastes or materials separated for recycling according to a certain schedule (DODD 4165.60, para V(A)).	Verify that solid wastes that contain food wastes are collected at a minimum of once a week. (1)(2)(3) Verify that bulky wastes are collected at a minimum of once every 3 mo. Verify that all wastes are collected with sufficient frequency to inhibit the propagation or attraction of vectors and the creation of nuisances.
KO.9-21. Installations must collect solid waste in a safe and efficient manner (DODD 4165.60, para V(A)).	Verify that solid wastes or materials separated for recycling are collected in a safe, efficient manner. (2)(3) Verify that the operator of the collection vehicle immediately cleans up any spillage caused by his or her operations.
KO.9-22. Installations should inspect receptacles for industrial shop waste quarterly to verify that hazardous wastes are not being deposited in them (MP).	Verify that receptacles are inspected quarterly. (2)(3) Verify that corrective actions are taken where indicated.
KO.9-23. Installations must meet specific requirements with regard to the management of bulky wastes (FGS-ROK, Chapter 7, Criterion 3e).	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. (1)(2)(3) Verify that bulky wastes are screened for the presence of hazardous constituents and ozone depleting substances. Verify that readily detachable or removable hazardous waste is segregated and disposed of properly. (NOTE: See Section 4, *Hazardous Waste Management.*)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
LAND DISPOSAL SITES	(NOTE: The requirements of this section of the manual apply only to those installations that operate a MSWMF.)
Specific Wastes	
KO.9-24. Bulky wastes must be disposed of in a specific fashion (DODD 4165.60, para V(A)).	Verify that automobile bodies, furniture, and appliances are either salvaged or crushed and pushed onto the working face near the bottom of the cell. (1)(2)(3) Verify that demolition and construction debris, tree stumps, and large timbers are pushed onto the working face near the bottom of the cell.
KO.9-25. Water treatment plant sludges must be covered with soil or MSW (DODD 4165.60, para V(A)).	Verify that water treatment plant sludges are covered with soil or MSW. (1)(2)(3)
KO.9-26. Incinerator and air pollution control residues must be disposed of in a specific fashion (DODD 4165.60, para V(A)).	Verify that incinerator and air pollution control residues are incorporated into the face and covered as necessary to prevent them from becoming airborne. (1)(3)
KO.9-27. Installations must develop procedures for dealing with yard waste and construction debris (FGS-ROK, Chapter 7, Criterion 3L(6)).	Verify that the installation has developed procedures for dealing with yard waste and construction debris that keep it out of MSWMF units to the maximum extent possible (e.g., composting, recycling). (1)(3)
Operations	
KO.9-28. Installations must investigate options for composting MSW (FGS-ROK, Chapter 7, Criterion 3L(4)).	Verify that the installation has investigated options for composting MSW as an alternative to landfilling or treatment prior to landfilling. (1)(2)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-29. Installations must implement programs to detect and prevent the disposal of certain wastes in their MSWMFs (FGS-ROK, Chapter 7, Criteria 3L(3) and 3L(13)).	Verify that the installation has a program that effectively prevents the disposal in the MSWMF of hazardous waste, infectious waste, PCB waste, and other waste determined to be unsuitable for the specific landfill. (1)(2)(3) Verify that the installation prohibits the disposal of bulk or noncontainerized liquids in the MSWMF, if possible.
KO.9-30. Installations that operate land disposal sites must provide a list of excluded materials to regular users and develop criteria for unacceptable materials (FGS-ROK, Chapter 7, Criterion 3L(2) and DODD 4165.60, para V(A)).	Verify that a list of excluded materials is displayed prominently at the entrance to the site. (1)(2) Verify that a list of excluded materials is given to all regular users of the site. Verify that the installation has established criteria for unacceptable wastes based on site-specific factors. (NOTE: Examples of site-specific factors are: - hydrology - chemical and biological characteristics of the waste - available alternative disposal methods - environmental and health effects - safety of personnel.)
KO.9-31. Installations must use certain standard sanitary landfill techniques as part of their operations (FGS-ROK, Chapter 7, Criterion 3L(1) and DODD 4165.60, para V(A)).	Verify that standard techniques of spreading and compacting solid wastes are used. (1)(2)(3) Verify that, on any operating day, MSW handling equipment is capable of: - spreading solid waste in layers no more than 0.6 m (2 ft) thick while confining it to the smallest practicable area - compacting the spread solid wastes to the smallest practicable volume. Verify that daily cover is placed over disposed solid waste at the end of each operating day, regardless of weather.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-32. Specific requirements as to cover material must be met at land disposal sites (DODD 4165.60, para V(A)).	Verify that cover material is applied as necessary to: (1)(2)(3) - minimize fire hazards - minimize infiltration of precipitation - minimize odors - minimize blowing litter - control gas venting - control vectors - discourage scavenging - provide a pleasing appearance. Verify that intermediate cover is applied on areas where additional cells are not to be constructed for extended periods of time. Verify that final cover is applied on each area as it is completed or if the area is to remain idle for over 1 yr.
KO.9-33. Land disposal sites that accept special wastes must have approval of the responsible agency (DODD 4165.60, para V(A)).	Determine whether the land disposal site accepts special wastes. (1)(2) Verify that the land disposal site has agency approval to accept special wastes.
KO.9-34. Installations must operate land disposal sites in such a way as to protect water quality (FGS-ROK, Chapter 7, Criterion 3L(11) and DODD 4165.60, para V(A)).	Verify that surface watercourses and runoff are diverted from the land disposal site. (1)(2) Verify that the land disposal site is constructed and graded to promote rapid surface water runoff without excessive erosion. Verify that the site is regraded as necessary to avoid ponding of precipitation and to maintain the integrity of cover material. Verify that siltation or retention basins or other approved methods of retarding runoff are used where necessary to avoid stream siltation or flooding problems. Verify that leachate collection and treatment systems are used where necessary to protect groundwater and surface water resources. Verify that MSW and leachate are not in contact with groundwater or surface water. Verify that aquifers will not be contaminated.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-35. Installations must operate land disposal sites in such a way as to protect air quality (FGS-ROK, Chapter 7, Criterion 3L(5) and DODD 4165.60, para V(A)).	Verify that there is no open burning of MSW. (1)(2)(3) (NOTE: Infrequent burning of agricultural wastes, silvicultural wastes, land-clearing debris, diseased trees, or debris from emergency cleanup operations is allowed.) Verify that dust control measures are initiated as necessary.
KO.9-36. Installations must control decomposition gases at land disposal sites (FGS-ROK, Chapter 7, Criterion 3L(9) and DODD 4165.60, para V(A)).	Verify that decomposition gases are not allowed to migrate laterally from the land disposal site. (1)(2)(3) Verify that decomposition gases do not pose an explosion or toxicity hazard. Verify that methane generated by the MSWMF unit does not exceed 25 percent of the lower explosive limit for methane in facility structures. (NOTE: The lower explosive limit for methane is 5.0 percent by volume.)
KO.9-37. Installations must control vectors at land disposal sites (FGS-ROK, Chapter 7, Criterion 3L(8) and DODD 4165.60, para V(A)).	Verify that conditions at the land disposal site are unfavorable for the harboring, feeding, and breeding of disease vectors. (1)(2)(3) Verify that vector control contingency programs are implemented when necessary to prevent or rectify vector problems.
KO.9-38. Land disposal sites must be designed and operated in an aesthetically acceptable manner (FGS-ROK, Chapter 7, Criterion 3L(10) and DODD 4165.60, para V(A)).	Verify that blowing litter is controlled through portable litter fences or other devices. (1)(2)(3) Verify that wastes that are easily moved by wind are covered as necessary to prevent their becoming airborne. Verify that onsite vegetation is cleared only as necessary. Verify that natural windbreaks are maintained Verify that buffer strips and/or berms are used to screen the site from nearby residences and major roadways. Verify that salvage material is removed from the site frequently.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-39. Installations must control public access to landfill facilities (FGS-ROK, Chapter 7, Criterion 3L(12)).	Verify that public access to landfill facilities is controlled. (1)(2)(3)
KO.9-40. Land disposal sites must be designed, constructed, and operated in such a way as to protect the health and safety of personnel (FGS-ROK, Chapter 7, Criterion 3L(7) and DODD 4165.60, para V(A)).	Verify that a safety manual is available to personnel. (1)(2)(3) Verify that personal safety devices are provided to facility personnel. Verify that equipment is provided with safety devices. Verify that there are provisions to extinguish fires. Verify that communications equipment is available on site. Verify that scavenging is prohibited. Verify that traffic signs or markers are provided to promote an orderly traffic pattern to and from the discharge area.
KO.9-41. Operators of land disposal sites must maintain records of their operations (FGS-ROK, Chapter 7, Criterion 3L(14)).	Verify that records on the operations of the landfill are maintained. (1)(2)(3)
KO.9-42. The records kept by operators of land disposal sites must contain certain information (DODD 4165.60, para V(A)).	Verify that records include at least: (1)(2)(3) - major operational problems, complaints, or difficulties - results of leachate sampling and analyses - results of gas sampling and analyses - results of groundwater and surface water quality sampling and analyses upstream and downstream from the site - vector control efforts - dust and litter control efforts - quantitative measurements of the solid wastes handled - description of solid waste materials received.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Closure and Postclosure	
KO.9-43. Installations should survey for and be aware of old disposal sites (MP).	Verify that the installation has conducted a survey for old disposal sites. (1)(2)
KO.9-44. Installations must take specific actions in the course of closure and postclosure operations (FGS-ROK, Chapter 7, Criteria 3m(1) through 3m(3)).	Verify that a final cover is installed that is designed to minimize infiltration and erosion. (1)(2)(3) 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 0.00005 cm/s, whichever is less. Verify that the erosion layer is a minimum of 21 cm (8 in.) of earth material that can sustain native plant growth.
KO.9-45. Installations must prepare a written closure plan that meets specific requirements (FGS-ROK, Chapter 7, Criterion 3m(4)).	Verify that the installation has a written closure plan. (1)(2)(3) Verify that the closure plan is kept as part of the installation's permanent records. Verify that the closure plan includes the following, at a minimum: - 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
KO.9-46. Installations should, upon closure of a site, record a detailed description with the area's land recording authority (MP).	Verify that, upon closure of a site, a detailed description is recorded with the area's land recording authority. (1)(2)(3)
New Landfills	
KO.9-47. Installations must not initiate new or expand existing waste landfill units (FGS-ROK, Chapter 7, Criterion 3j).	Verify that the installation does not initiate a new or expanded waste landfill unit. (1)(2)(3)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-48. The design and operation of new MSWMF units must incorporate certain broad factors (FGS-ROK, Chapter 7, Criterion 3k and DODD 4165.60, para V(A)).	Verify that the following broad factors are taken into account in the design and operation of the new MSWMF: (1)(2)(3) - location restrictions in regard to airport safety (i.e., bird hazards), floodplains, wetlands, aquifers, seismic zones, and unstable 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. Verify that the following have been evaluated: - the onsite soil characteristics - climatic conditions - socioeconomic factors.
KO.9-49. Plans for the design, construction, and operation of new sites or modifications to existing sites must be prepared or approved by a professional engineer (DODD 4165.60, para V(A)).	Verify that a professional engineer has prepared or approved plans. (1)(2)
THERMAL PROCESSING FACILITIES	
KO.9-50. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must provide special areas for certain wastes while they await processing (DODD 4165.60, para V(A)).	Verify that storage areas for bulky wastes, digested and dewatered sludges from wastewater treatment facilities, raw sewage sludges, and septic tank pumpings are clearly marked. (1)(2)(3) (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-51. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must train personnel in any unusual handling requirements for accepting certain wastes (DODD 4165.60, para V(A)).	Verify that personnel are thoroughly trained to handle bulky wastes, digested and dewatered sludges from wastewater treatment facilities, raw sewage sludges, and septic tank pumpings. (1)(2)(3) (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-52. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must inform regular users about materials that are excluded (DODD 4165.60, para V(A)).	Verify that regular users are given a list of excluded materials. (1)(2)(3) Verify that a list of excluded materials is posted prominently at the facility. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-53. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must have certain procedures and precautions to deal with unacceptable wastes that are delivered to or left at the facility (DODD 4165.60, para V(A)).	Verify that there is an operating plan that specifies procedures and precautions to be taken if unacceptable wastes are delivered to or left at the facility. (1)(2)(3) Verify that operating personnel are thoroughly trained in such procedures. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-54. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must meet certain site selection criteria (DODD 4165.60, para V(A)).	Verify that the facility is located in an area zoned for industrial use and has adequate utilities to serve it. (1)(2)(3) Verify that the site is accessible by permanent roads leading from the public road system. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-55. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must have plans for the design of new facilities or modification of existing facilities prepared or approved by a professional engineer (DODD 4165.60, para V(A)).	Verify that a professional engineer prepares or approves plans for the design of new facilities or modification of existing facilities. (1)(2)(3) (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-56. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must operate in a manner that protects water quality (DODD 4165.60, para V(A)).	Verify that all waters discharged from the facility are treated to meet the most stringent of applicable water quality standards. (1)(2)(3) Verify that, when monitoring instrumentation indicates excessive discharge contamination, appropriate adjustments are made to lower the concentrations to acceptable levels. Verify that, in the event of an accidental spill, the local regulatory agency is notified immediately. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-57. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must operate in a manner that protects air quality (DODD 4165.60, para V(A)).	Verify that emissions do not exceed applicable, existing emission standards. (1)(2)(3) Verify that all emissions, including dust from vents, are controlled. Verify that, when monitoring equipment indicates excessive emissions, appropriate adjustments are made to lower the emissions to acceptable levels. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-58. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must control vectors (DODD 4165.60, para V(A)).	Verify that a housekeeping schedule is established and maintained. (1)(2)(3) Verify that solid waste and residue do not accumulate at the facility for more than 1 week. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-59. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must operate in an aesthetically acceptable manner (DODD 4165.60, para V(A)).	Verify that a routine housekeeping and litter removal schedule is established and implemented. (1)(2)(3) Verify that solid wastes that cannot be processed by the facility are removed on a weekly basis. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-60. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must dispose of residue and other solid waste products resulting from the thermal process in an environmentally acceptable manner (DODD 4165.60, para V(A)).	Verify that the furnace operator records, in a log, the estimated percentage of unburned combustibles. (1)(2)(3) Verify that, if residue or fly ash is collected in a wet condition, it is drained of free moisture. Verify that residue and fly ash are transported by means that prevent the loads from shifting, falling, or blowing from the container. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-61. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must be designed, operated, and maintained in a manner to protect the health and safety of personnel (DODD 4165.60, para V(A)).	Verify that procedures are developed for operation in emergency situations. (1)(2)(3) Verify that approved respirators or self-contained breathing apparatus are available at convenient locations. Verify that training in first aid practices and emergency procedures are given to all personnel. Verify that personal safety devices are provided to all personnel. Verify that any regular user or individual who poses a safety hazard is barred from the facility and reported to the responsible agency. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-62. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must follow certain general operation criteria (DODD 4165.60, para V(A)).	Verify that the facility supervisor is experienced in the operation of the type of facility designed. (1)(2)(3) Verify that alternate and standby disposal and operating procedures are established for implementation during emergencies, air pollution episodes, and shutdown periods. Verify that a routine maintenance schedule is established. Verify that engineering drawings are updated as the facility is modified. Verify that key operational procedures are prominently posted. Verify that equipment manuals, catalogs, spare parts lists, and spare parts are readily available at the facility.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-62. (continued)	Verify that training opportunities are available for personnel. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
KO.9-63. Installations with thermal processing facilities designed to process or that are processing 50,800 kg (50 tons) or more per day of MSW must provide records and monitoring data (DODD 4165.60, para V(A)).	Verify that extensive monitoring and recordkeeping are practiced during: (1)(2)(3) - the first 12 to 18 mo of operation of a new or renovated facility - periods of high air pollution - periods of upset conditions at the facility. Verify that operating records are kept in a daily log and include as a minimum: - the total weight and volume of solid waste received during each shift, including the number of loads received, the ownership or specific identity of delivery vehicles, and the source and nature of the solid wastes accepted - furnace and combustion chamber temperatures recorded at least every 60 min and as changes are made, including explanations for abnormally high and low temperatures - rate of operation, such as grate speed - overfire and underfire air volumes and pressure and distribution recorded at least every 60 min and as changes are made - weights of bottom ash, grate siftings, and fly ash, individually or combined, recorded at intervals appropriate to normal facility operation - estimated percentages of unburned material in the bottom ash - water used on each shift for bottom ash quenching and scrubber operation - power produced and utilized during each shift - quality, production totals, and consumption rates if steam is produced - auxiliary fuel used for each shift - gross calorific value of daily representative samples of bottom ash, grate siftings, and fly ash - required emission measurements and laboratory analyses - complete records of monitoring instruments - problems encountered and methods of solution. (NOTE: Representative samples of process waters should be collected and analyzed as recommended by the responsible agency.) (NOTE: Sampling time should be varied so that all shifts are monitored on a weekly basis.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-63. (continued)	Verify that an annual report is prepared and that it includes the following information: - minimum, average, and maximum daily volume and weight of waste received and processed, summarized on a monthly basis - summary of the laboratory analyses, including at least monthly averages - number and qualifications of personnel in each job category - total work-hours per week - number of state certified or licensed personnel - staffing deficiencies - serious injuries, their cause, and preventive measures instituted - identification and brief discussion of major operational problems and solutions - adequacy of operation and performance with regard to environmental requirements, general level of housekeeping and maintenance, testing and reporting proficiency, and recommendations for corrective actions - copy of all significant correspondence, reports, inspection reports, and any other communications from enforcement agencies. Verify that a methodology for evaluating the facility's performance has been developed. (NOTE: This does not apply to hazardous, agricultural, or mining wastes.)
RESOURCE RECOVERY FACILITIES	
KO.9-64. Certain installations must establish and/or use resource recovery facilities to separate and recover materials, energy, or both, from solid waste (DODD 4165.60 (V)(F) and 4165.60(V)(H)).	Determine whether the installation generates 101,600 kg (100 tons) or more per day of residential, commercial, and institutional solid waste after complying with waste reduction and source separation policies. (1)(2)(3) Verify that the installation establishes and/or uses resource recovery facilities. Verify that joint or regional civilian community resource recovery facilities are utilized whenever possible.
KO.9-65. Installations that establish or utilize a resource recovery facility must design such facilities to process a standard amount of solid waste (DODD 4165.60, para V(A)).	Verify that the facility is designed to process at least 65 percent (by wet weight) of the input solid waste into recycled material, fuel, or energy. (1)(2)(3)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
COMPOSTING FACILITIES **KO.9-66.** Composting facilities that process 5000 tons [≈4540 metric tons] of sludge from a domestic wastewater treatment plant annually must meet specific standards (FGS-ROK, Chapter 7, Criterion 3o).	Verify that a record is maintained for the characteristics of the waste, sewage sludge, and other materials, including the source and volume or weight of the material. (1)(2)(3) Verify that access to the facility is controlled. Verify that all access points are secured when the facility is not in operation. Verify that by-products (including residual materials that can be recycled) are stored to prevent vector intrusion and aesthetic degradation. Verify that materials that are not composted are removed periodically. 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. Verify that the temperature and retention time for material being composted is monitored and recorded. Verify that the compost is analyzed periodically for the following: - percentage of total solids - volatile solids as a percentage of total solids - pH - ammonia - nitrate nitrogen - total phosphorus - cadmium - chromium - copper - lead - nickel - zinc - mercury - PCBs. Verify that compost is produced by a process that further reduces pathogens.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-66. (continued)	(NOTE: Two acceptable methods of production are windrowing and the enclosed vessel method: - 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 - 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.)
KO.9-67. Compost produced at a facility that processes 5000 tons [≈4540 metric tons] of sludge from a domestic wastewater treatment plant annually must be distributed in accordance with the classification of the compost (FGS-ROK, Chapter 7, Criterion 3p).	Verify that compost distributed or marketed as commercial fertilizer, speciality fertilizer, soil amendment, or plant amendment is registered with the Executive Agent. (1)(2)(3) Verify that Class A compost is: - stabilized - stored until it has matured (a 60 percent decomposition). Verify that Class B compost is distributed on a restricted basis only. (NOTE: Class A compost may be distributed for unrestricted use, including agricultural applications.) (NOTE: The Executive Agent determines appropriate distribution for Class B compost.)
OPEN DUMPING	
KO.9-68. Installations must not practice open dumping in certain areas (FGS-ROK, Chapter 7, Criterion 3q).	Verify that the installation does not dump any waste in cultural properties areas, parks, squares, camping areas, public beaches, roads, harbors, fishery ports, sewer systems, rivers, lakes, forests, and other areas or facilities without justifiable reasons. (1)(2) (NOTE: Other areas where dumping is not permitted are: - coastal areas - areas so designated and declared to produce or preserve marine products - areas, such as roadsides, railroad track beds, or resort areas - areas so designated and declared to preserve the quality of agricultural water - areas within 15,000 m [≈49,213 ft] from service water reservoirs or protection areas for service water (30,000 m [≈98,425 ft] in case of a service water reservoir for a very wide area).)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
LARGE VOLUME WASTE GENERATORS **Collection and Transportation**	
KO.9-69. Installations that are large volume waste generators of MSW must use appropriate disposal methods (FGS-ROK, Chapter 7, Criterion 3r).	Verify that the installation disposes of domestic solid waste through the local government or approved contractors. (1)(2) (NOTE: Approved contractors include: - recyclers authorized by the Regional Administrator of Environmental Administration - public special waste disposal facilities of the Environmental Management Corporation.) Verify that MSW contractors are in compliance with the FGS-ROK standards for MSW disposal.
KO.9-70. Large volume MSW generators that manage the disposal of their waste must meet collection and transportation standards (FGS-ROK, Chapter 7, Criterion 3r(1)).	Verify that the collection and transportation of MSW is performed by either: (1)(2) - the generator of the waste - waste disposal businessmen. Verify that recyclable, combustible, and noncombustible MSW are separately collected and transported. (NOTE: Separation/classification schemes may differ depending on the collection plan of each city/county/ward or local conditions.) Verify that different types of MSW are not mixed during transportation. (NOTE: MOE has yet to classify the different waste types.) Verify that transportation equipment is airtight to avoid the generation of offensive odors, leachate, or the blowing off of refuse. Verify that transportation equipment is cleaned so as not to blow dust and trash after unloading MSW at landfills.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Disposal	
KO.9-71. Large volume generators must dispose of domestic solid waste at certain sites only (FGS-ROK, Chapter 7, Criterion 3r(2)(a)).	Verify that the installation disposes of domestic solid waste at either the contractor's facilities, public landfills, other disposal sites. (1)(2) Verify that contractors used by the installation meet the standards for landfills, incinerators, and other disposal methods outlined below.
KO.9-72. Landfills that receive MSW must meet specific standards (FGS-ROK, Chapter 7, Criterion 3r(2)(b)).	Verify that landfills have signs posted in English and Korean languages that read "Landfill Area for General Waste." (1)(2) Verify that each gate leading to the landfill has a sign that reads "Municipal Solid Waste Landfill Area" in both English and Korean languages and that also: - has a height of 100 cm [≈39 in.] or more, width of 100 cm [≈39 in.] or more, and length of 50 cm [≈20 in.] or more - includes the name, address, and phone number of the landfill manager. Verify that landfills where two or more kinds of MSW that do not require pretreatment are deposited have signs that describe each such waste type. (NOTE: Certain waste (yet to be defined by the Ministry of Environment (MOE)) must be pretreated prior to landfilling.) Verify that, in cases where there is possibility of water pollution due to leachate, a leachate disposal facility is in place and any leachate is treated to meet the water quality standards of Section 13, *Water Quality Management*). Verify that daily cover consists of at least 15 cm [≈6 in.] of soil materials and is applied after daily work is completed. Verify that intermediate cover of at least 30 cm [≈12 in.] is applied when landfill operations are suspended more than 7 days. Verify that final cover of at least 50 cm [≈20 in.] is applied when the use of the landfill site is completed. (NOTE: Daily and intermediate cover need not be applied if MSW does not emit offensive odor or blow off.) Verify that MSW that contains 40 percent or more of septic materials (e.g., waste food, sludge, or carcasses) and is not classified as special waste is covered when the height of such waste reaches 3 m [≈10 ft]. (NOTE: In the case where MSW inappropriate to direct landfilling is nevertheless landfilled, the landfill must be filled up after conducting appropriate pretreatment.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-73. Certain MSW must undergo pretreatment that meets specific standards (FGS-ROK, Chapter 7, Criterion 3r(2)(b)).	Verify that certain MSW (yet to be defined by the MOE) undergoes pretreatment that meets the requirements of FGS-ROK, Chapter 7, Criteria 3r(2)(c) and 3r(2)(d). (1)(2) (NOTE: See checklist items KO.9-74 and KO.9-75.)
KO.9-74. Incinerators that receive MSW must meet specific standards (FGS-ROK, Chapter 7, Criterion 3r(2)(c)).	Verify that the installation uses an incinerator that meets the emission standards for air pollutants in Section 1, *Air Emissions Management.* (1)(2) Verify that offensive odors and dust are not transmitted beyond the incineration facilities. Verify that off-installation incineration facilities are approved by the Minister of Environment.
KO.9-75. Other facilities that dispose of MSW must not interfere with the surrounding living environment (FGS-ROK, Chapter 7, Criterion 3r(2)(d)).	Verify that facilities that dispose of solid waste by compaction, shredding, composting, or other methods do not interfere with the surrounding living environment through noise, offensive odor, dust, or sludge generation. (1)(2)
MEDICAL WASTE **General**	
KO.9-76. Radioactive medical waste must be managed in accordance with service directives (FGS-ROK, Chapter 8, Criterion 3a(5)).	Determine whether the installation disposes of radioactive medical waste. (1)(3) Verify that such waste is disposed of in accordance with AF guidance.
Generation	
KO.9-77. All personnel who handle infectious medical waste must wear protective apparel or equipment (FGS-ROK, Chapter 8, Criterion 3a(8)).	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. (1)(3)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-78. Mixtures of infectious medical waste and other types of waste must be handled in accordance with specific criteria (FGS-ROK, Chapter 8, Criteria 3a(1) and 3a(3)).	Verify that mixtures of infectious medical waste and hazardous wastes are handled as infectious hazardous waste. (1)(3) (NOTE: Priority is given to the hazard that presents the greatest risk.) (NOTE: Mixtures of infectious medical wastes and hazardous wastes are the responsibility of the generating USFK component.) Verify that mixtures of solid waste and infectious medical waste are handled as infectious medical waste.
KO.9-79. RMW must be handled in accordance with specific requirements (FGS-ROK, Chapter 8, Criteria 3a(2) and 3a(6)).	Verify that RMW is segregated from nonregulated medical waste at its point of origin and securely bagged to provide a barrier between waste and worker. (1)(3) Verify that RMW is placed in leakproof, puncture resistant, plastic bag lined receptacles. Verify that bags used to contain RMW are: - sturdy - tear resistant - 3 mils in thickness - red in color. Verify that red bags are used only for RMW. Verify that, as a minimum, all RMW containers except red bags are marked with the bilingual universal biohazard symbol and include markings that identify: - the generator - date of generation - contents.
KO.9-80. Sharps must be handled in accordance with specific requirements (FGS-ROK, Chapter 8, Criterion 3a(7)).	Verify that sharps are discarded only into rigid receptacles. (1)(3) Verify that sharps containers are sized according to the activity, sealed when 3/4 full, and picked up for disposal. Verify that needles are not clipped, cut, bent, or recapped before disposal.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-81. Medical waste generators must develop local RMW standard operating procedures (SOPs) (FGS-ROK, Chapter 8, Criterion 3a(4)).	Verify that the medical waste generator has developed a local RMW SOP that details local implementation of these requirements and disposal contingency plans. (1)(3)
Transport	
KO.9-82. Regulated medical waste must be handled in accordance with specific requirements (FGS-ROK, Chapter 8, Criterion 3b).	Verify that infectious medical waste is transported and stored in such a way as to minimize human exposure to the extent possible. (1)(3) Verify that carts of storage containers used to transport RMW are constructed of readily cleanable material (plastic, or stainless steel) and are closed whenever possible. Verify that all carts or storage containers used for RMW transport and storage are marked with a bilingual universal biohazard symbol. Verify that a spill containment and cleanup kit is maintained in each vehicle transporting RMW. (NOTE: See checklist item KO.9-94 for suggestions on the contents of the RMW spill kit.)
Storage	
KO.9-83. RMW storage containers must meet specific requirements (FGS-ROK, Chapter 8, Criterion 3c(1)).	Verify that the RMW storage container is a leakproof rigid container constructed of heavy plastic or metal that can be easily cleaned. (1)(3) Verify that the RMW storage container is marked with the bilingual universal biohazard symbol. Verify that the RMW storage container has: - a capacity no greater than 55 gal [≈208 L] - a lid - a red plastic bag (3 mil) used as a liner. (NOTE: The RMW container may also serve as a transport container.)

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BES (Bioenvironmental Services) (4) Base Staff Judge Advocate

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-84. RMW must be stored in a designated RMW storage area (FGS-ROK, Chapter 8, Criterion 3c(2)).	Verify that RMW is stored in a designated RMW storage area that is: (1)(3) - secured - properly identified with a bilingual universal biohazard symbol - kept clean and free from pests. (NOTE: Storage time should be kept as short as possible.) (NOTE: Pathological waste is exempt from the requirements of this checklist item.)
KO.9-85. Installations must meet specific standards with regard to the management of anatomical pathology waste (FGS-ROK, Chapter 8, Criterion 3c(3)).	Verify that all anatomical pathology waste is placed in containers lined with plastic bags that comply with the requirements of checklist item 8-85 above. (1)(3) Verify that anatomical pathological waste is disposed of only by incineration or burial. Verify that pathological waste is kept refrigerated in the morgue freezer prior to pickup for disposal. Verify that the maximum time for freezer storage of any RMW does not exceed 30 days.
Treatment/Disposal	
KO.9-86. Infectious medical waste must be treated in accordance with specific standards (FGS-ROK, Chapter 8, Criteria 3d(1)).	Verify that medical waste is treated prior to disposal in accordance with Table 9-2. (1)(3) Verify that, in addition to the requirements of Table 9-2: - liquid microbiological waste is rendered noninfectious by steam sterilization or incineration, prior to disposal in a sanitary sewer system - solid microbiological waste is steam sterilized prior to disposal with general waste or is incinerated - CDC Risk Group IV waste is decontaminated by steam sterilization, incineration, or other approved technologies prior to disposal - suction canister waste from operating rooms is either decanted into a clinical sink or sealed into leak-proof containers and incinerated. (NOTE: Vaccine waste requires no treatment prior to steam sterilization or incineration.) (NOTE: Sharps containers require no treatment prior to incineration or other approved disposal technologies.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-86. (continued)	(NOTE: Blood and blood products require no treatment prior to disposal in the sanitary sewer system or prior to steam sterilization or incineration. Established blood bank procedures for bulk blood take precedence.)
KO.9-87. Sterilizers must meet specific operating requirements (FGS-ROK, Chapter 8, Criterion 3d(2)).	Verify that, if sterilization is required, sterilizers are maintained at a temperature of 121 °C (250 °F) for at least 90 min. (1)(3) Verify that, if sterilization is required, the effectiveness of sterilizers is checked at least weekly using *Bacillus stearo thermophilus* spore strips or an equivalent biological performance test.
KO.9-88. Incinerators used to treat medical waste must meet specific design and operating standards (FGS-ROK, Chapter 8, Criterion 3d(3)).	Verify that the incinerator maintains: (1)(3) - a minimum primary chamber temperature between 1440-1600 °F [760-871 °C] - a secondary chamber temperature between 1800-2000 °F [982-1100 °C] - a minimum residence time in the secondary chamber of 2.0 s sufficient to destroy all infectious agents and pathogens. Verify that the incinerator meets all applicable requirements listed in Section 1, *Air Emissions Management.*
KO.9-89. Ash or residue from the incineration of infectious medical waste must be assessed for hazardous characteristics (FGS-ROK, Chapter 8, Criterion 3d(4)).	Verify that ash or residue from the incineration of infectious medical waste is assessed for hazardous characteristics. (1)(3) Verify that ash that is determined to be hazardous waste is managed as hazardous waste. (NOTE: See Section 4, *Hazardous Waste Management.*) Verify that all other residue that is not determined to be hazardous is disposed of in accordance with the requirements of Chapter 7 of the FGS-ROK. (NOTE: See above.)
KO.9-90. Installations must meet specific requirements with regard to RMW disposal logs (FGS-ROK, Chapter 8, Criterion 3d(5)).	Verify that RMW disposal logs are maintained for all RMW waste accepted for disposal and retained for 3 yr after the date of disposal. (1)(3) Verify that RMW disposal logs contain, at a minimum: - date generated - type of waste - weight of waste - method of disposal.

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-91. RMW disposal contracts must meet certain requirements (FGS-ROK, Chapter 8, Criterion 3d(6)).	Determine whether the installation uses a contractor to dispose of its RMW. (1)(3) Verify that the RMW disposal contract requires that the disposal contractor certifies with a receipt that RMW is properly disposed in agreement with ROK requirements and in a manner that minimizes occupational exposure and protects both the environment and the public.
KO.9-92. Installations must develop contingency plans for the disposal of RMW in case the primary means becomes inoperable (FGS-ROK, Chapter 8, Criterion 3d(7)).	Verify that the installation has a written, detailed contingency plan. (1)(3)
KO.9-93. Chemical disinfection must be conducted using approved procedures and compounds (FGS-ROK, Chapter 8, Criterion 3d(8)).	Verify that, if chemical disinfection is required, such disinfection is conducted using procedures and compounds approved by USFK medical personnel for use on any pathogen or infectious agent suspected to be present in the waste. (1)(3)
Spills	
KO.9-94. Spill containment and cleanup kits must be maintained in the vicinity of RMW generation, at the disposal site, and within each RMW transportation vehicle (FGS-ROK, Chapter 8, Criterion 3e(1)).	Verify that a spill containment and cleanup kit is maintained at a designated location in the vicinity of RMW generation, at the disposal site, and within each vehicle used to transport RMW. (1)(3) (NOTE: Suggested minimum items for the kit are: - absorbent material capable of absorbing 5 gal [≈19 L] of liquid - hospital grade disinfectant effective against mycobacteria - sufficient red plastic bags with sealing or closure devices to double enclose 150 percent of the maximum load accumulated or transported - sufficient quantity of impermeable overalls, gloves, boots, caps, and surgical masks to accommodate cleanup personnel.)

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.9-95. Spills of infectious medical waste must be cleaned up in accordance with specific requirements (FGS-ROK, Chapter 8, Criterion 3e(2)).	Verify that spills of infectious medical waste are cleaned up as soon as possible. (1)(3) Verify that response personnel wear personal protective equipment that is sufficient to prevent risk of exposure to infectious agents or pathogens. Verify that spills of blood or body fluids are removed with absorbent material. Verify that such absorbent material is then managed as infectious medical waste. Verify that surfaces contacted by infectious medical waste are washed with soap and water and chemically decontaminated.
Training	
KO.9-96. All employees and new employees of RMW generators who have direct contact with patients or who handle RMW must receive proper training (FGS-ROK, Chapter 8, Criteria 3f(1) and 3f(2)).	Verify that all employees of regulated medical waste generators who have direct contact with patients, or who segregate, package, store, transport, treat, or dispose of RMW are provided annual training in RMW that is pertinent to the primary job of the employee being trained. (1)(3) Verify that annual formal training in RMW includes reiteration of worksite policies and procedures. Verify that all new employees having contact with RMW as explained above receive initial training that includes an orientation to local RMW worksite policies and procedures before the employee begins work.
KO.9-97. Written documentation of all training must be maintained (FGS-ROK, Chapter 8, Criterion 3f(3)).	Verify that written documentation of all training is maintained by the regulated medical waste generator supervisor for 3 yr or the duration of the employee's tour, whichever is shorter. (1)(3)

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BES (Bioenvironmental Services) (4) Base Staff Judge Advocate

Table 9-1

CDC Classification of Etiologic Agents on the Basis of Hazard Class IV*

(FGS-ROK Table 8-1 [Corrected])

Anthrax
Congo-Crimean Hemorrhagic Fever
Creutzfeldt-Jakob Disease
Ebola
Hypr
Junin
Kyasanur Forest Disease
Lassa Fever
Machupo
Marburg Virus Disease
Omsk Hemorrhagic Fever
Plague
Russian Spring/Summer Encephalitis
Smallpox

* Listing not all inclusive.

Source: Biosafety in Microbiologic and Biomedical Laboratories CDC 84-8395, Centers for Disease Control, Atlanta, Georgia, USA.

Table 9-2

Treatment and Disposal Methods for Infectious Medical Waste

(FGS-ROK Table 8-2)

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

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 13, *Water Quality Management.*

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

INSTALLATION:	COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 10

STORAGE TANK MANAGEMENT

Korea ECAMP

SECTION 10

STORAGE TANK MANAGEMENT

A. Applicability of this Section

This section applies to U.S. Air Force (USAF) installations that have aboveground storage tanks (ASTs) and/or underground storage tanks (USTs), whether or not those tanks are organizational tanks and regardless of the nature of their contents; that is, it addresses the management of ASTs and USTs, whether they are used to store hazardous substances, hazardous waste, or POL.

The regulatory requirements in this section are based on Department of Defense (DOD) regulations and Air Force Instructions (AFIs) that apply at overseas installations. Management Practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force (AF) employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 9, outlines the criteria for the control and abatement of pollution from the storage, transfer, and distribution of petroleum products. Chapter 6 of that document addresses hazardous waste tank systems, and Chapter 19 details requirements for USTs in general.

C. U.S. Air Force Documents

- AFI 23-201, *Fuels Management*, 28 July 1994, provides managers at all AF activities with policy and procedures for fuels operations.

- Air Force Manual (AFM) 85-16, *Maintenance of Petroleum Systems*, governs the maintenance of permanently installed storage and dispensing systems for petroleum and unconventional fuels.

D. Responsibility for Compliance

- The Safety Manager is responsible for conducting workplace safety evaluations and inspections of the handling and storage of hazardous materials and waste. The Safety Manager will provide the appropriate manager with a report of his or her findings and recommended corrective actions. The Safety Manager is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.

- The Base Fuels Management Officer (BFMO) is responsible for the safe and efficient receipt, storage, handling, issuing, and accounting of all petroleum products and for all general operations and inspections.

- The Base Civil Engineer (BCE) is responsible for the maintenance of all installed petroleum storage and dispensing systems. This responsibility often is discharged by the Liquid Fuels Maintenance (LFM) shop. The BCE also is responsible for the calibration of permanently installed meters.

- The Base Environmental Coordinator (BEC) monitors all POL activities that may affect the environment and usually is responsible for the coordination of the EPC review and updates of the spill plan. The BEC often coordinates notification of reportable spills on behalf of the IOSC.

- The Bioenvironmental Engineering Services (BES) takes samples to determine the chemical nature, pollutant concentration, and extent of each reportable-quantity spill as required for response actions and documentation.

E. Definitions

- *Bulk Storage Tanks* - field-erected tanks, usually having a capacity greater than 190,000 L (50,000 gal), and constructed aboveground or belowground (FGS-ROK, 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. A listing of these substances and corresponding reportable quantity is contained in Table 4-1, Chart A.4. The term does not include (FGS-ROK, 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 hazardous substances and petroleum, and that is not a petroleum UST system (FGS-ROK, Chapter 19, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *New Underground Storage Tank* - any UST installed on or after 1 October 1994 (FGS-ROK, 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-ROK, Chapter 18, Definitions).

- *Organizational Fuel Tank* - any tank, other than integral vehicle tanks or hand-carried safety cans, not under exclusive fuels management control. (AFI 23-201, Attachment 5, Section B).

- *POL* - oil of any kind, including but not limited to, petroleum, oils, lubricants (including synthetic oils), fuel, oil sludges, oil refuse, and oil mixed with other wastes. Refined petroleum, oils and lubricants include synthetic oils, oil sludges, and oily wastes (FGS-ROK, Chapter 9, Definitions).

  For purposes of USTs, 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-ROK, Chapter 19, 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-ROK, Chapter 9, Definitions).

- *Reportable Quantity (RQ)* - for POL, a released quantity of 110 gal [≈416 L] or more (FGS-ROK, Chapter 18, Definitions).

  (NOTE: RQs for other substances are listed in the RQ column, Table 4-1, Chart A.4.)

- *Significant Spill* - an uncontained release to the land or water in excess of any of the following quantities (FGS-ROK, 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 reportable quantity listed therein
  2. for POL or liquid or semi-liquid hazardous material, hazardous waste or hazardous substance, in excess of 415 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-ROK, Chapter 9, Definitions).

- *Underground Storage Tank (UST)* - any tank, including underground piping connected thereto, larger than 416 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-ROK, 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. vaulted tanks.

STORAGE TANK MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.10-1 through KO.10-4	(1)(2)(3)(12)
ASTs	KO.10-5 through KO.10-15	(1)(3)(4)(5)(7)
USTs		
General	KO.10-16 through KO.10-21	(1)(2)(3)(4)(7)(13)
New USTs	KO.10-22 through KO.10-24	(1)(3)(13)
Existing USTs	KO.10-25 through KO.10-27	(1)(3)(4)(7)(13)
Leaking USTs	KO.10-28 through KO.10-30	(1)(3)(4)(13)
Additional Requirements for Hazardous Substance USTs	KO.10-31 through KO.10-33	(2)(13)
Hazardous Waste Tank Systems	KO.10-34 through KO.10-42	(1)(2)(5)(13)

(a) CONTACT/LOCATION CODE:

(1) BEC (Base Environmental Coordinator)
(2) BCE (Base Civil Engineer)
(3) BFMO (Base Fuels Management Office)
(4) LFM (Liquid Fuels Maintenance)
(5) BES (Bioenvironmental Engineering Services)
(6) Base Fire Department
(7) Power Production
(8) AAFES (Army/Air Force Exchange Service) Service Station Manager
(9) Generating Activities
(10) Vehicle Maintenance Shop
(11) Safety Officer
(12) Base Staff Judge Advocate
(13) Hazardous Waste Storage Area Manager

STORAGE TANK MANAGEMENT

Records To Review

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

Physical Features To Inspect

- Aboveground storage tanks and dikes
- UST areas

People To Interview

- BEC (Base Environmental Coordinator)
- BCE (Base Civil Engineer)
- BFMO (Base Fuels Management Office)
- LFM (Liquid Fuels Maintenance)
- BES (Bioenvironmental Engineering Services)
- Base Fire Department
- Power Production
- AAFES (Army/Air Force Exchange Service) Service Station Manager
- Generating Activities
- Vehicle Maintenance Shop
- Safety Officer
- Base Staff Judge Advocate
- Hazardous Waste Storage Area Manager

COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ALL INSTALLATIONS	
KO.10-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.10-2. Copies of all relevant DOD directives/ instructions, U.S. Air Force (USAF) directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(12) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 23-201, *Fuels Management,* 28 July 1994 - AFM 85-16, *Maintenance of Petroleum Systems.* Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the base Environmental Protection Committee.
KO.10-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning storage tank management have been issued since the finalization of the manual. (1)(2)(12) Verify that the installation is in compliance with newly issued regulations.
KO.10-4. Certain fuel tanks must be equipped with high-level alarms and automatic high-level shut-off valves (AFI 23-201, para A11.1).	Verify that the following tanks have high-level alarms and automatic high-level shut-off valves: (3) - BFMO fuel tanks that have the capacity to receive fuel by pipeline - BFMO fuel tanks that have the capacity to receive fuel by tank truck installed with off-loading pumps and headers. Verify that BFMO has established safe fill levels below the high-level alarm level.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ASTs	
KO.10-5. All ASTs must have secondary containment that is impermeable to petroleum products (AFI 23-201, para A11.1).	Verify that all ASTs have secondary containment that is impermeable to petroleum products. (3)(4)
KO.10-6. Dikes around bulk ASTs should be inspected daily (MP).	Verify that dikes are inspected daily. (3) Verify that any deficiencies noted on AFTO Form 39 have been corrected. (NOTE: This MP also applies to diking around tanks that are not under exclusive fuels management control.)
KO.10-7. Drainage of stormwaters from diked areas around bulk ASTs must be controlled by a valve (FGS-ROK, Chapter 9, Criterion 3b(3)).	Verify that drainage of stormwater from diked areas around bulk ASTs is controlled by a valve. (3)(4) Verify that such valves are locked closed when not in active use.
KO.10-8. Certain good management practices should be followed when tending diked areas around bulk ASTs (MP).	Verify that drainage valves are attended when open. (3)(4) Verify that drainage water is tested to determine whether it represents a harmful discharge. Verify that water drained from diked areas does not cause a harmful discharge. Verify that personnel draining the diked area know how to identify a discharge.
KO.10-9. Drainage water from diked areas around bulk ASTs that is determined to contain petroleum products in harmful quantities must be treated before discharge (FGS-ROK, Chapter 9, Criterion 3b(4) and AFI 23-201, para A11.1).	Verify that, prior to draining stormwater from diked areas, the water is inspected for petroleum sheen. (3)(4) Verify that any sheen is collected with adsorbent material prior to drainage, or treated using an oil-water separator. Verify that the adsorbent material is disposed of according to any hazardous characteristics it exhibits. Verify that drainage water that contains residual petroleum products or hazardous chemicals is not discharged.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-10. All bulk ASTs must be either double-walled with interstitial monitoring or provided with a secondary means of containment for the entire contents plus sufficient free board to allow for precipitation and expansion of product (FGS-ROK, Chapter 9, Criterion 3b(1)).	Verify that all bulk ASTs are either double-walled with interstitial monitoring or provided with a secondary means of containment. (3)(4) Verify that the secondary means of containment has sufficient capacity for the entire contents plus sufficient free board to allow for precipitation and expansion of product.
KO.10-11. The maximum permeability for diked areas around bulk ASTs must be 10^{-7} cm/s [≈4 x 10^{-8} in./s] (FGS-ROK, Chapter 9, Criterion 3b(2)).	Verify that the permeability of diked areas does not exceed 10^{-7} cm/s [≈4 x 10^{-8} in./s]. (1)(3)(4)(7)
KO.10-12. The BCE, LFM, and BFMO should have a memorandum of agreement (MOA) pertaining to draining of floating roof tanks and interior dike basins (MP).	Verify that a MOA has been prepared and signed or coordinated through the BES and the BEC. (1)(3)(4)(5) Verify that copies of the MOA are on file at BFMO, the Service Call Desk, LFM, BEC, BCE, and BES. (NOTE: This MP is based on guidelines found in AFM 85-16, Attachment 5.)
KO.10-13. Washwater and fuel sludge resulting from periodic tank cleaning must be tested for hazardous characteristics (FGS-ROK, Chapter 9, Criterion 3c).	Verify that tank cleaning wastes are tested for hazardous characteristics as defined in Table 4-1, Chart A-2. (1)(3)(4) (NOTE: This requirement does not apply if the installation can demonstrate and document sufficient knowledge of the hazardous waste by other means.) Verify that tank bottom waters that are periodically drained from bulk storage tanks are collected and tested for hazardous characteristics. Verify that wastes that test positive for hazardous characteristics are handled as hazardous waste.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-13. (continued)	(NOTE: Wastes containing 5 percent or more of oil that does not exhibit hazardous characteristics are classified as special waste and managed in accordance with Section 4, *Hazardous Waste Management.*) (NOTE: Washwater containing less than 5 percent of oil and not classified as a special waste is handled in accordance with Section 12, *Wastewater Management* (see especially Table 12-4).)
KO.10-14. ASTs should undergo periodic integrity testing (MP).	Verify that periodic leak tests have been conducted. (1)(3)(4)(7) (NOTE: A decrease in converted fuel volume equal to or greater than 0.65 cm [0.25 in.] constitutes a suspected leak). (NOTE: Such techniques as the following may be employed to test tank integrity: - hydrostatic testing - visual inspection - a system of nondestructive shell thickness testing.) Verify, that the BCE, Environmental Coordinator, and Safety Officer have been notified of all confirmed leaks. Verify that leaking tanks have been repaired or replaced.
KO.10-15. Installations should inspect MOGAS, diesel, kerosene, and aviation fuel test cell storage tanks periodically (MP).	Verify that inspections have been conducted as required. (1)(3)(4)(7) Verify that leaking or deteriorated tanks have been repaired or replaced. Verify that leaks were reported to the BCE, Environmental Coordinator, and Safety Officer.
USTs **General**	
KO.10-16. Installations must maintain a UST inventory (FGS-ROK, Chapter 19, Criterion 3a).	Verify that the installation has an inventory of USTs (including hazardous substance USTs). (1)(2)(13)
KO.10-17. Fuels personnel must be properly trained on UST leak detection equipment (AFI 23-201, para A11.3).	Verify that fuels personnel are trained on leak detection equipment associated with USTs and on proper data collection and recording procedures. (3)

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-18. Installations should use UST systems made of or lined with materials compatible with the substance stored (MP).	Verify that the substances stored in UST systems are compatible with the system. (1)(7)(13)
KO.10-19. The filling of a UST should include the prevention of overfilling and spilling of the substance (MP).	Verify that controls are in use that prevent overfilling and spilling. (1)(3)(4)(13) (NOTE: It is useful to observe the filling operations, to review records for reports, and to check surrounding grounds for visible or odorous indications of contaminated soil.) Verify that the level of the UST is checked before a transfer is made. Verify that fill lines are capped and locked.
KO.10-20. UST systems with corrosion protection should meet specific requirements (MP).	Determine which UST systems at the installation have corrosion protection. (1)(3)(4)(7)(13) Verify that the corrosion protection system operates continuously to provide corrosion protection to the metal components that routinely contain regulated substances and are in contact with the ground. Verify that all cathodic protection systems are tested within 6 mo after installation and every 3 yr thereafter. Verify that UST systems with impressed current cathodic protection are inspected every 60 days. Verify that inspection records are maintained of the last three inspections for systems with impressed current cathodic protection and of the last two inspections for all other cathodic protection systems. Verify that new USTs are appropriately protected from corrosion. Verify that the voltage is greater than -0.85 V, but not more than -3.0 V (monthly), for impressed current systems. Verify that the voltage is greater than -0.85 V, but not more than -3.0 V (biannually), for sacrificial anode systems. Verify that leak detection and failure are reported.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-21. Repairs to USTs should be performed according to industry standards (MP).	Verify that the following procedures are used to repair USTs: (1)(3)(4)(7)(13) - fiberglass reinforced tanks are repaired by the manufacturer's authorized representative or according to industry standards - metal pipe fittings and sections that have leaked because of corrosion are replaced, whereas fiberglass may be repaired according to manufacturer's specifications. Verify that tanks and piping that have been replaced or repaired are tested for tightness within 30 days. (NOTE: Tanks and piping need not be tested if: - repairs are internally inspected - repaired portion is already monitored monthly - an equally protective test is used.) Verify that, within 6 mo of repair, tanks with cathodic protection systems are tested as follows: - every 3 yr thereafter for all cathodic protection systems - every 60 days for impressed current cathodic protection systems. Verify that records of repairs are maintained for the life of the tank.
New USTs	(NOTE: These requirements apply to USTs for POL and to those for hazardous substances.)
KO.10-22. New tanks and piping must have corrosion protection (FGS-ROK, Chapter 19, Criterion 3b(1)).	Determine whether any USTs have been installed since 1 October 1994. (1)(3)(13) Verify that such new tanks and piping have corrosion protection. (NOTE: This requirement does not apply if the tanks and/or piping are constructed of fiberglass or other noncorrodible materials.) Verify that the corrosion protection system is certified by a competent authority.
KO.10-23. New USTs must be fitted with spill and overfill prevention equipment (FGS-ROK, Chapter 19, Criterion 3b(2)).	Verify that new USTs have spill and overflow prevention equipment. (1)(3)(4)(7)(8)(13) (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.) Verify that, where spill and overfill prevention are required, a spill containment box is installed around the fill pipe.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-23. (continued)	Verify that overfill prevention equipment does one of the following: - automatically shuts off flow into the tank when the tank is no more than 95 percent full - sounds a high level alarm (set at 90 percent of the tank's capacity).
KO.10-24. Leak detection systems on new USTs must meet specific operating requirements (FGS-ROK, Chapter 19, Criterion 3b(3)).	Verify that leak detection systems are capable of detecting a 0.4 L (0.1 gal) per hour leak rate or a release of 570 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. (1)(3)(13) Verify that new pressurized piping is equipped with automatic line leak detectors and uses either an annual tightness test or monthly monitoring. Verify that suction piping is subject either to line tightness tests every 3 yr or to monthly monitoring.
Existing USTs	(NOTE: These requirements apply to USTs for POL and to those for hazardous substances.)
KO.10-25. 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 (FGS-ROK, Chapter 19, Criteria 3c(1) and 3c(2)).	Verify that existing USTs and piping without leak detection, corrosion protection, and spill/overflow protection are tightness tested annually according to recognized U.S. standards and inventoried monthly to verify system tightness. (1)(3)(4)(7)(13) Verify that existing tanks with corrosion protection and spill/overflow protection are tightness tested every 5 yr or inventoried monthly. Verify that a replacement and upgrading program is in place.
KO.10-26. USTs that are put out of service temporarily should have continued maintenance (MP).	Verify that proper maintenance is being performed for corrosion protection and release detection. (1)(3)(4)(13)
KO.10-27. If an existing UST has not been used for 1 yr, all of the product and sludges must be removed (FGS-ROK, Chapter 19, Criterion 3c(4)).	Determine whether there are USTs at the installation that have not been used for 1 yr or more. (1)(3)(4)(13) Verify that all of the product and sludges have been removed. (NOTE: Nonleaking tanks and abandoned tanks need not be removed from the ground, provided that they are cleaned and filled with an inert substance such as sand.)

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Leaking USTs	(NOTE: These requirements apply to USTs for POL and to those for hazardous substances.)
KO.10-28. Leaking USTs must be emptied and removed from service immediately (FGS-ROK, Chapter 19, Criterion 3c(3)).	Verify that leaking USTs are emptied and removed from service immediately. (1)(3)(4)(13) Verify that contaminated groundwater and/or soil are remediated when there is imminent or substantial danger. (NOTE: Imminent and substantial danger refers to acute injury or death, rather than illness or injury typically caused by long term, chronic exposure. A determination of whether an imminent and substantial danger exists shall be made by the IC after consultation with the USFK Surgeon and the USFK Assistant Chief of Staff Engineer.) Verify that all free standing POL is removed to the extent possible. Verify that, if the USTs are no longer needed, they are removed from the ground. Verify that, if the USTs are still needed, they are repaired or replaced.

KO.10-29. Installations with a confirmed release from a petroleum or hazardous substance UST should assemble information about the site and nature of the release (MP).	Verify that the following information is collected: (1)(3)(4)(13)
	
	- data on the nature and estimated quantities of the release
	- data from available sources and/or site investigations concerning:
	  - surrounding population
	  - water quality
	  - use and approximate locations of wells potentially affected
	  - subsurface soil conditions
	  - locations of subsurface sewers
	  - climatological conditions
	  - land use
	- results of site check
	- results of free product investigation.

KO.10-30. Installations with a confirmed release from a petroleum or hazardous substance UST, where site investigations have indicated free product, should, to the maximum extent possible, remove the free product (MP).	Determine whether there are release sites where the presence of free product has been confirmed. (1)(3)(4)(13) Verify that free product is removed in such a way that the spread of contamination is minimized.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Additional Requirements for Hazardous Substance USTs	
KO.10-31. Existing hazardous substance USTs must meet specific standards (FGS-ROK, Chapter 19, Criterion 3e).	Verify that 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. (2)(13) Verify that existing tanks and piping that do not incorporate leak detection are tightness tested annually and inventoried monthly.
KO.10-32. New hazardous substance USTs and piping must have secondary containment (FGS-ROK, Chapter 19, Criteria 3b and 3d(1)).	Verify that new hazardous substance USTs and their associated piping have secondary containment. (2)(13) (NOTE: The standards for secondary containment can be met by using double-walled tanks and piping, liners, or vaults.)
KO.10-33. Installations must monitor the interstitial space between the primary and secondary containment of new hazardous substance USTs monthly (FGS-ROK, Chapter 19, Criterion 3d(2)).	Verify that the interstitial space for tanks and piping is monitored monthly for liquids or vapors. (2)(13)

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
HAZARDOUS WASTE TANK SYSTEMS	

KO.10-34. Secondary containment must be in place for tank systems used to store or treat hazardous waste (FGS-ROK, Chapter 6, Criteria 3h(1) and 3h(4)).	(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: (2)(13)
	
	- 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.
	
	(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.)

KO.10-35. Tank ancillary equipment should also be provided with secondary containment (MP).	Verify that ancillary equipment has secondary containment. (2)(13) (NOTE: The following equipment is exempted from this MP: - aboveground piping that is visually inspected for leaks on a daily basis - welded flanges, welded joints, and welded connections that are visually inspected for leaks on a daily basis - sealless or magnetic coupling pumps and sealless valves that are visually inspected for leaks on a daily basis - pressurized aboveground piping systems with automatic shutoff valves that are visually inspected for leaks on a daily basis.)
KO.10-36. Existing tank systems without proper secondary containment must meet specific standards (FGS-ROK, Chapter 6, Criterion 3h(2)).	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. (2)(13) Verify that the installation obtains, and keeps on file at the Hazardous Waste Storage Area (HWSA), a written assessment of tank system integrity reviewed and certified by a competent authority.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-37. When new tank systems or components are installed, HWSA managers must obtain an assessment certifying that the tank system is acceptable (FGS-ROK, Chapter 6, Criterion 3h(3)).	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. (2)(13) Verify that the assessment indicates: - 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. Verify that the written assessment has been reviewed and certified by a competent authority.
KO.10-38. Tanks used for hazardous waste treatment or storage must be operated in accordance with specific procedures (FGS-ROK, Chapter 6, Criterion 3h(5)(a)).	Verify that hazardous wastes or treatment reagents are not placed in tanks if they could cause the tank system (including ancillary equipment or containment system) to fail. (2)(13)
KO.10-39. Tank systems for ignitable, reactive, or incompatible wastes should meet specific requirements (MP).	Verify that ignitable or reactive wastes are not placed in a tank system unless one of the following conditions is met: (2)(13) - the waste is treated, rendered, or mixed before or immediately after placement in the tank system so that it is no longer reactive or ignitable, and the minimum requirements for reactive and ignitable wastes are met - the waste is treated or stored in such a way that it is protected from any material or conditions that may cause the waste to ignite or react - the tank system is used solely for emergencies. Verify that the installation maintains minimum protective distances between waste management areas and any public ways, streets, alleys, or an adjoining property line that can be built upon, as required in Tables 2-1 through 2-6 of the National Fire Protection Association's (NFPA) *Flammable and Combustible Liquids Code.* Verify that, unless minimum safety requirements are met, incompatible wastes, or incompatible wastes and materials, are not placed in the same tank system. Verify that, unless minimum safety requirements are met, hazardous waste is not placed in a tank system that: - previously held an incompatible waste or material - has not been decontaminated.

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COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.10-40. Installations must conduct inspections of tank systems and associated equipment (FGS-ROK, Chapter 6, Criteria 3h(5)(b) and 3h(5)(c)).	Verify that the installation conducts and logs inspections of the following at least once each operating day: (2)(13) - aboveground portions of the tank system, to detect corrosion or releases - tank monitoring equipment (e.g., pressure and temperature gauges, monitoring wells) - data gathered from monitoring and leak detection equipment - the construction materials and the area surrounding the tank, including the secondary containment system, for signs of leakage (wet spots and dead vegetation). Verify that the proper operation of cathodic protection systems is confirmed within 6 mo after initial installation and annually thereafter. Verify that all sources of impressed current are inspected and/or tested every other month. Verify that the installation manager documents all tank system inspections.
KO.10-41. 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-ROK, Chapter 6, Criterion 3h(6)).	Verify that such systems are immediately removed from service and repaired or closed. (1)(2)(5)(13) Verify that the installation also takes the following steps: - stops the flow or addition of hazardous wastes to the tank - inspects systems to determine the cause of the release - 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.
KO.10-42. Installations must follow specific procedures when closing a tank system (FGS-ROK, Chapter 6, Criterion 3h(7)).	Determine whether the installation has closed any tank systems. (1)(2)(5)(13) Verify that all waste residues and contaminated containment system components, soils, structures, and equipment have been removed or decontaminated to the greatest extent practicable.

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INSTALLATION:	COMPLIANCE CATEGORY: STORAGE TANK MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 11

TOXIC SUBSTANCES MANAGEMENT

Korea ECAMP

SECTION 11

TOXIC SUBSTANCES MANAGEMENT

A. Applicability of this Section

This section applies to all U.S. Air Force (USAF) installations overseas; it is written in response to regulations and policy that are applicable to the conduct of activities that involve these programs and is used to determine the compliance status of the management activities associated with:

- Polychlorinated Biphenyls (PCBs) and in-service and out-of-service PCB Items
- asbestos in schools and on the installation
- the AF Radon Assessment and Mitigation Program (RAMP)
- LBP.

The regulatory requirements in this section are based on the *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), Department of Defense (DOD) regulations, and Air Force Instructions (AFIs) that apply at overseas installations. Management practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 14, discusses the actions and controls needed to abate threats to human health and the environment from the handling, use, storage, and disposal of PCBs. Chapter 15 addresses similar issues for asbestos, and Chapter 16 outlines the criteria for assessing and mitigating radon.

C. U.S. Air Force Documents

PCBs

- There are no AFIs on PCBs; FGS-ROK addresses issues previously covered by various policy letters.

- HQ USAF/CE Letter, *Air Force Policy on Measuring Air Force PCB-Free Status - Action Memorandum*, 21 March 1994, revises how the Air Force's PCB-free status is measured. Instead of measuring the number of PCB items rendered PCB-free, the new metric is the number of installations that are PCB-free based on data in the PCB Module of the Work Information Management System - Environmental Subsystem (WIMS-ES).

Asbestos

- AFI 32-1052, *Facility Asbestos Management*, 22 March 1994, establishes requirements and assigns responsibilities to incorporate facility asbestos management principles and practices into all AF programs.

- Air Force Occupational Safety and Health (AFOSH) Standard 161-4, *Exposure to Asbestos*, January 1980, also contains information on asbestos requirements and control.

Radon

- There are no AFIs on radon; FGS-ROK is the source for all radon-related checklist items in this manual.

LBP

- HQ USAF Policy Letter, *Air Force Policy and Guidance on Lead-Based Paint (LBP) in Facilities*, 24 May 1993, specifies actions necessary to protect facility occupants and workers and the environment from hazardous exposure to lead in LBPs. Table 11-1 summarizes the likelihood of LBP being present and the regulations/guidelines that normally must be followed.

D. Responsibility for Compliance

PCBs

- The Base Civil Engineer (BCE), through the Exterior Electrical Shop or the Base Environmental Coordinator, is responsible for identifying, inspecting, marking (labeling), and properly servicing PCB electrical equipment (transformers and capacitors).

- The Base Environmental Coordinator (BEC) is responsible for ensuring that out-of-service items are located in a technically adequate PCB storage facility. Normally, such facilities are located at a Defense Reutilization and Marketing Office (DRMO), and the DRMO is responsible for storage, disposal transportation, and contracting for disposal.

- The Bioenvironmental Engineering Services (BES) is responsible for arranging chemical analytical support in screening electrical equipment for PCBs and for cleanup verification.

Asbestos

- The BCE appoints an Asbestos Program Officer to prepare the Asbestos Management Plan and an Asbestos Operations Officer to prepare the Asbestos Operating Plan. The BCE ensures a sufficient number of in-house technicians and supervisors are trained and equipped to remove, repair, and control asbestos-containing materials (ACMs).

- The Asbestos Program Officer prepares the Asbestos Management Plan, that contains documentation on all asbestos management efforts and the mechanism for oversight of the program.

- The Asbestos Operations Officer prepares and implements the Asbestos Operating Plan.

- The BES takes air samples, evaluates friable materials for the preservation of asbestos, and assigns Risk Assessment Codes (RACs).

Radon

- The BCE is responsible for reviewing radon assessments planning and programming and for instituting radon mitigation for existing and future facility projects.

- The BES is responsible for sampling radon gas levels at installation offices, housing, day care facilities, etc. The BES provides these sample results to the BCE. The BES is also responsible for mitigation.

LBP

- The BCE participates in developing and implementing the management plan for identifying, evaluating, managing, and abating LBP. Additionally, the BCE trains personnel and maintains records of activities.

- The Chief, Aerospace Medicine ensures a coordinated epidemiological analysis of facility lead sampling results and sees to it that positive pediatric lead analysis is accomplished.

- The BES conducts testing and sampling of paint to determine the lead content. The BES participates in inspections and training activities as well.

E. Definitions

- *Asbestos* - a generic term used to describe six distinctive varieties of fibrous mineral silicates, including chrysotile, amosite, crocidolite, tremolite asbestos, anthophylite asbestos, actinolite asbestos, and any other of these materials that have been chemically treated and/or altered (FGS-ROK, Chapter 15, Definitions).

- *Asbestos-Containing Material (ACM)* - any material containing more than 1 percent asbestos by weight (FGS-ROK, Chapter 15, Definitions).

- *Capacitor* - a device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric (FGS-ROK, Chapter 14, Definitions).

- *Chemical Waste Landfill* - a landfill at which a high level of protection against risk of injury to human health or the environment from migration of deposited PCBs to land, water, or the atmosphere is provided by incorporating special methods for locating, engineering, and operating the landfill (FGS-ROK, Chapter 14, Definitions).

- *Detailed Radon Testing* - a comprehensive testing program for radon (FGS-ROK, Chapter 16, Definitions).

- *Friable Asbestos* - any ACM that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure (FGS-ROK, Chapter 15, Definitions).

- *High-Priority Facilities* - with respect to LBP, facilities or portions of facilities that are or may be frequented/used by children under age seven, which are further prioritized as follows (USAF/CC Policy Letter, 24 May 1993, *AF Guidance on LBP in Facilities*, Section 5a):
  1. child development centers, annexes, and playground equipment
  2. on-base AF licensed family day care homes
  3. youth centers, recreational facilities, and playgrounds
  4. waiting areas in medical and dental treatment centers
  5. AF-maintained DOD schools
  6. military family housing (MFH) currently occupied by families with children under age 7
  7. remaining MFH.

- *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 [≈98 ft] of a nonindustrial, nonsubstation building. Commercial buildings are typically accessible to both members of the general public and employees, and include: (FGS-ROK, Chapter 14, Definitions)
    1. public assembly properties
    2. educational properties
    3. institutional properties
    4. residential properties
    5. stores
    6. office buildings
    7. transportation centers (e.g., airport terminal buildings, subway stations, bus stations, or train stations).

- *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-ROK, Chapter 14, Definitions).

- *Initial Radon Screening* - short-term radon testing in a statistically representative sample of selected high priority facilities (family housing, child development centers, schools, dormitories, etc.). The purpose of initial screening is to identify installations having high radon levels (FGS-ROK, Chapter 16, Definitions).

- *Leak or Leaking* - any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface (FGS-ROK, Chapter 14, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Mark* - the descriptive name, instructions, cautions, or other information applied to PCBs and PCB items, or other objects subject to FGS-ROK (FGS-ROK, 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-ROK (FGS-ROK, Chapter 14, Definitions).

- *Mitigation* - actions taken to reduce radon levels in facilities having radon levels higher than 4 pCi/L [148 Bq/m^3] as identified during detailed radon testing (FGS-ROK, Chapter 16, Definitions).

- *Non-PCB Transformer* - a transformer that contains less than 50 ppm PCB (FGS-ROK, Chapter 14, Definitions).

- *PCB Article* - any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCB. This includes capacitors, transformers, electric motors, pumps, and pipes (FGS-ROK, Chapter 14, Definitions).

- *PCB Article Container* - any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, and whose surface(s) has not been in direct contact with PCBs (FGS-ROK, Chapter 14, Definitions).

- *PCB Container* - any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles, and whose surface(s) has been in direct contact with PCBs (FGS-ROK, Chapter 14, Definitions).

- *PCB-Contaminated Electrical Equipment* - any electrical equipment including, but not limited to, transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, and cable that contain 50 ppm or greater PCB, but less than 500 ppm PCB (FGS-ROK, Chapter 14, Definitions).

- *PCB Equipment* - any manufactured item, other than a PCB container or a PCB article container, that contains a PCB article or other PCB equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures (FGS-ROK, Chapter 14, Definitions).

- *PCB Item* - any PCB article, PCB article container, PCB container, or PCB equipment that deliberately or unintentionally contains, or has as a part of it, any PCB or PCBs at a concentration of 50 ppm or greater (FGS-ROK, Chapter 14, Definitions).

- *PCB Transformer* - any transformer that contains 500 ppm PCB or greater (FGS-ROK, Chapter 14, Definitions).

- *Permissible Exposure Limit (PEL)* - an airborne concentration of 0.1 of an asbestos fiber per cubic centimeter (0.1 f/cc) as an 8-h time-weighted average (FGS-ROK, 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 4 pCi/L [148 Bq/m^3] (FGS-ROK, Chapter 16, Definitions).

- *Radon* - a naturally occurring, odorless, colorless, inert radioactive gas that is formed from the radioactive decay of uranium. Radon gas becomes a health hazard when it accumulates in an enclosed area or poorly ventilated spaces, and occupants breathe the high levels of radon over a prolonged period of time. The gas can move through small spaces in the soil and rock on which the structure is built. It can seep into a structure through dirt floors, cracks in concrete floors and walls, floor drains, sumps, joints, and tiny cracks or pores in hollow-block walls (FGS-ROK, 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-ROK, Chapter 14, Definitions).

- *Substantial Contact Area* - an area that is subject to public access on a routine basis or which could result in substantial dermal contact by employees (FGS-ROK, Chapter 14, Definitions).

TOXIC SUBSTANCES MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
PCB Management		
All Installations	KO.11-1 through KO.11-3	(1)(2)(11)
General	KO.11-4 through KO.11-8	(1)(3)
PCB Records	KO.11-9 through KO.11-12	(1)(3)
PCB Transformers	KO.11-13 through KO.11-21	(1)(2)(3)
Other PCB Items	KO.11-22 through KO.11-25	(3)(7)
PCB Spills	KO.11-26 through KO.11-28	(1)(2)(3)
PCB Storage	KO.11-29 through KO.11-31	(1)(3)
PCB Disposal	KO.11-32 through KO.11-36	(1)(3)(4)(5)(6)
Asbestos Management		
All Installations	KO.11-37 through KO.11-39	(1)(2)(11)
General	KO.11-40 through KO.11-46	(1)(9)(10)
Personnel Safety	KO.11-47 and KO.11-48	(1)(9)(10)
Renovation and Demolition	KO.11-49 through KO.11-53	(1)(7)(9)(10)

(a) **CONTACT/LOCATION CODE:**

(1) BCE (Environmental Planning)
(2) BES (Bioenvironmental Engineering Services)
(3) BCE (Exterior Electric Shop)
(4) DRMO (Defense Reutilization and Marketing Office)
(5) BCE (Contract Programmer)
(6) BCE (Contract Management)
(7) BCE (Chief of Operations and Maintenance)
(8) School Principal
(9) Asbestos Program Officer
(10) Asbestos Operating Officer
(11) SJA (Staff Judge Advocate)
(12) Base Safety Officer
(13) PAO (Public Affairs Officer)

(continued)

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
Asbestos Management (continued)		
Asbestos Disposal	KO.11-54 through KO.11-56	(1)(2)(9)(10)
Asbestos in Schools	KO.11-57	(8)(9)
Radon Management		
All Installations	KO.11-58 through KO.11-69	(1)(2)(11)
Lead-Based Paint (LBP)		
All Installations	KO.11-70 through KO.11-80	(1)(2)(11)

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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
- LBP Hazard Abatement Plan

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

People To Interview

- BCE (Environmental Planning)
- BES (Bioenvironmental Engineering Services)
- BCE (Exterior Electric Shop)
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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
PCB MANAGEMENT **All Installations**	
KO.11-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.11-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - HQ USAF/CE Letter, *Air Force Policy on Measuring Air Force PCB-Free Status - Action Memorandum,* 21 March 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.11-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether new regulations concerning PCBs have been issued since the finalization of the manual. (1)(2)(11) Verify that the installation is in compliance with newly issued regulations.
General	
KO.11-4. PCB items (see definition) and rooms, vaults, or storage areas that contain them must be marked in English and the host nation language (FGS-ROK, Chapter 14, Criterion 3a(3)).	Verify that PCB items and rooms, vaults, or storage areas that contain them are prominently marked in English and the language of the Republic of Korea. (1)(3) Verify that the items or areas are identified as containing PCBs. Verify that there is a warning against improper handling and disposal. Verify that a phone number is provided for use in the event of spills or questions about disposal. (NOTE: Fluorescent light ballasts are excluded from this marking requirement.)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-5. Installations must repair or replace leaking PCB Transformers within 48 h or as soon as possible (FGS-ROK, Chapter 14, Criteria 3a(6) and 3b(8)).	Verify that the installation repairs or replaces leaking PCB Transformers within 48 h. (1)(3) Verify that leaking PCB fluids are containerized.
KO.11-6. All transformers and electrical equipment procured locally after 1 October 1994, must contain less than 10 ppm PCB (FGS-ROK, Chapter 14, Criterion 3a(7)).	Determine whether the installation has any transformers or electrical equipment procured locally after 1 October 1994. (1)(3) Verify that such transformers and electrical equipment are certified to contain less than 10 ppm PCB.
KO.11-7. Transformers containing greater than 50 ppm PCB must be phased out and replaced (FGS-ROK, Chapter 14, Criterion 3a(8)).	Determine whether the installation has any transformers containing greater than 50 ppm PCB. (1)(3) Verify that such transformers will be phased out and replaced with new non-PCB transformers by 1 January 2005.
KO.11-8. Transformer fluids containing greater than 50 ppm PCB must not be used (FGS-ROK, Chapter 14, Criterion 3a(9)).	Verify that the installation does not use transformer fluids containing greater than 50 ppm PCB in any application. (1)(3)
PCB Records	
KO.11-9. Certain installations should prepare written annual document logs by 1 July of each calendar year (MP).	Determine whether at any time the installation uses or stores any of the following: (1)(3) - more than 45 kg [99.4 lb] of PCBs in PCB Containers - PCB Transformers with concentrations of 50 ppm or greater - one or more large PCB capacitors of high or low-voltage. Verify that, by 1 January of each calendar year, the installation prepares a written annual log that covers the previous year.

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.11-9. (continued)	Verify that the written annual document log addresses the following:
	
	- identification of facility
	- calendar year covered
	- manifest number for every manifest generated
	- total number (by type) of PCB Articles, PCB Article Containers, and PCB Containers placed into storage for disposal or disposed of during the calendar year
	- total weight placed into storage for disposal or disposed of during the calendar year of:
	  - PCBs in PCB Articles
	  - contents of PCB Article Container
	  - contents of PCB Containers
	  - bulk PCB waste
	- a list of PCBs and PCB Items remaining in service at the end of the calendar year
	- the total weight of any PCBs and PCB Items in containers including identification of container contents and the total number of PCB Transformers, PCB large capacitors of high- and low-voltage, and the total weight of PCBs in PCB Transformers
	- a record of each telephone call or other form of verification to confirm the receipt of PCB waste transported by independent transport.
	
	Verify that the annual document log contains the following for each manifest, for each unmanifested waste, and for any PCBs or PCB Items received from or shipped from another facility owned or operated by the generator:
	
	- date removed from service for disposal (first date material placed in PCB Container)
	- date placed into transport for offsite storage/disposal
	- date of disposal (if known)
	- weight of PCB wastes
	  - total bulk PCB wastes
	  - total in each article (PCB Transformers or capacitors)
	  - total in each container (PCB Containers)
	  - total weight of contents and of the PCB Article (in kilograms) in each PCB Article Container
	- serial number or other unique identification number (except for bulk wastes)
	- description of the contents of PCB Containers and article containers.
	
	Verify that the following information is provided in the annual record:
	
	- all signed manifests generated or received at the facility during the calendar year
	- all certificates of disposal that have been generated or received during the calendar year.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-9. (continued)	Verify that the annual document log and annual records (manifests, certificates of disposal) are kept for at least 5 yr after the facility stops using or storing PCBs and PCB Items in the listed quantities.
KO.11-10. Installations with PCB Items must maintain a written inventory of those PCB Items (FGS-ROK, Chapter 14, Criterion 3a(4)).	Verify that the installation maintains a written inventory of PCB Items. (1)(3) Verify that the inventory contains a current list, by type, of all PCB Items in use with their laboratory test results, placed into storage for disposal, or disposed of for that year. Verify that a copy of the inventory is provided to the U.S. Forces - Korea (USFK) Environmental Programs Office (EPO).
KO.11-11. All required periodic inspections must be documented at the installation (FGS-ROK, Chapter 14, Criterion 3a(5)).	Verify that all required periodic inspections are documented at the installation. (1)(3)
KO.11-12. Installations must retain records of inspections and maintenance histories for 3 yr after disposal of a transformer (FGS-ROK, Chapter 14, Criterion 3a(5)).	Determine whether the installation has disposed of any transformers. (1)(3) Verify that records of inspections and maintenance histories are retained for at least 3 yr after the disposal of a transformer.
PCB Transformers (500 ppm or greater)	
KO.11-13. PCB transformers that are in use or in storage for reuse may not be used in any application that poses a risk of contamination to food or feed (FGS-ROK, Chapter 14, Criterion 3b(1)).	Verify that no PCB transformer is used in any application that poses a risk of contamination to food or feed. (1)(3)

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COMPLIANCE CATEGORY:
TOXIC SUBSTANCES MANAGEMENT
Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
KO.11-14. Certain PCB transformers must be equipped with electrical protection (FGS-ROK, Chapter 14, Criterion 3b(3)).	Verify that PCB transformers that are used in or near commercial buildings or located in sidewalk vaults have electrical protection to minimize transformer failure that would result in the release of PCBs. (1)(3)
KO.11-15. PCB transformers must be registered with the fire department (FGS-ROK, Chapter 14, Criterion 3b(2)).	Verify that all PCB transformers, including those in storage for reuse, are registered with the fire department. (1)(3) (NOTE: It would be useful to provide the following information: - physical location of PCB transformer(s) - principle constituent of dielectric fluid (i.e., PCBs, mineral oil, silicone oil, etc.) - name and telephone number of contact person knowledgeable of PCB transformer(s).)
KO.11-16. Combustible materials should not be stored near PCB transformers (MP).	Verify that all combustible materials have been removed from areas within PCB transformer enclosures (i.e., vaults or partitioned areas) and from areas within 5 m [16 ft] of a PCB transformers or their enclosures. (1)(3) (NOTE: Combustible materials include, but are not limited to, paints, solvents, plastics, paper, and scrap wood.)
KO.11-17. PCB transformers must be serviced properly (FGS-ROK, Chapter 14, Criterion 3b(5)).	Verify that servicing activities are properly conducted as follows: (1)(3) - transformers classified as PCB-contaminated electrical equipment are serviced only with dielectric fluid that contains less than 500 ppm PCB - the transformer coil is not removed during servicing - PCBs removed during servicing are captured and disposed of properly - dielectric fluids containing less than 500 ppm that are mixed with fluids containing 500 ppm or greater are not used as dielectric fluid in any electrical equipment - dielectric fluids containing 500 ppm or greater are not used as dielectric fluid in any transformers classified as PCB-contaminated electrical equipment.

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-18. Installations must inspect certain PCB transformers (FGS-ROK, Chapter 14, Criteria 3a(6), 3b(6) and 3b(8)).	Verify that leaking PCB transformers that have not been repaired or replaced are inspected daily. (1)(3) Verify that in-service PCB transformers are inspected at least once every 3 mo. (1)(3) Verify that the following are inspected at least every 12 mo: - 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 PCBs. (NOTE: It would be useful to record the following information as part of each PCB transformer inspection: - 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 - data and description of any cleanup, containment, or repair performed - results of any daily inspections of transformers with uncorrected active leaks.)
KO.11-19. Personnel who discover leaking PCB transformers should follow proper reporting procedures (MP).	Verify that personnel who discover leaking PCB transformers follow proper reporting procedures. (1)(3)
KO.11-20. PCB transformers that have been removed and stored for reuse must be returned to their original application and location only (FGS-ROK, Chapter 14, Criterion 3b(4)).	Verify that PCB transformers are returned to their original application and location and not used at another location. (1)(3) (NOTE: This restriction does not apply if there is no practical alternative to use at another location.) Verify that such alternative use does not exceed 1 yr.

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-21. Installations must take specific actions if a PCB transformer is involved in a fire (FGS-ROK, Chapter 14, Criterion 3b(7)).	Verify that, if a PCB 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. (1)(2)(3) Verify that runoff water is tested and treated if required. (NOTE: Blocking floor drains is one way to control water runoff.)
Other PCB Items	
KO.11-22. Installations must service electromagnets, switches, and voltage regulators that may contain PCBs at any concentration in accordance with specific standards (FGS-ROK, Chapter 14, Criterion 3c(1)).	Verify that PCB-contaminated electrical equipment is serviced only with dielectric fluid that contains less than 500 ppm PCB. (3) Verify that the installation does not service any electromagnets, switches, or voltage regulators that contain PCB concentrations of 500 ppm or greater. (NOTE: This restriction applies only if it is necessary to remove and rework any internal components as part of service.) Verify that PCBs removed during servicing are captured and either reused as dielectric fluid (if less than 50 ppm) or disposed of properly. Verify that PCBs from electromagnets, switches, and voltage regulators with a PCB concentration of at least 500 ppm are not mixed with or added to dielectric fluid from PCB-contaminated electrical equipment. Verify that dielectric fluids that contain 500 ppm or greater are not used as dielectric fluid in any electromagnets, switches, and voltage regulators classified as PCB-contaminated electrical equipment.
KO.11-23. Installations must meet specific requirements with regard to the use and storage of PCB large capacitors (FGS-ROK, Chapter 14, Criterion 3c(2)).	Verify that the installation does not use PCB large capacitors (whether of high or low voltage) that pose an exposure risk to food or feed. (3) Verify that the installation does not store such capacitors for use. Verify that the installation uses PCB large capacitors (whether of high or low voltage) only in restricted-access electrical substations or in contained and restricted-access indoor areas. Verify that there is no public access to such capacitors that have been installed indoors. Verify that such capacitors have been installed indoors only where the roof, walls, and floor are adequate to contain any release of PCBs.

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-24. When PCB items are removed from service, they must be marked with the removal date (FGS-ROK, Chapter 14, Criterion 3c(4)).	Determine whether the installation is storing any PCB items that have been removed from service. (3) Verify that all PCB items removed from service are marked with the date on which they were removed from service.
KO.11-25. When fluorescent light ballasts are replaced, they must be properly classified (FGS-ROK, Chapter 14, Criterion 3c(3)).	Verify that installation personnel look for the "No PCB" label when replacing fluorescent light ballasts. (7) Verify that unmarked ballasts are classified as either PCB ballasts or are determined to be PCB free.
PCB Spills	
KO.11-26. Installations must address PCBs in their spill contingency plan (FGS-ROK, Chapter 14, Criteria 3a(1) and 3d(1)(e)).	Determine whether the installation has any PCB items. (1)(2)(3) Verify that PCB items are addressed in the spill contingency plan. (NOTE: This requirement also applies to PCB items in temporary storage.) Determine whether PCB storage facilities are located where they are at risk from seismic activity, floods, or other natural events. Verify that the installation's spill contingency plan addresses such storage facilities directly. (NOTE: See Section 8, *Petroleum, Oil, and Lubricant (POL) Management*, for further details on the contents of the spill plan).
KO.11-27. Spills of PCB liquids at concentrations of 50 ppm or greater must be responded to immediately and cleaned up according to specific standards (FGS-ROK, Chapter 14, Criterion 3a(2)).	Verify that the installation responds immediately to spills of PCB liquids at concentrations of 50 ppm or greater. (1)(2)(3) Verify that surfaces located in substantial contact areas are cleaned to 10 µg per 100 cm^2 [≈15 $in.^2$]. Verify that surfaces in all other contact areas are cleaned to 100 µg per 100 cm^2 [≈15 $in.^2$]. Verify that contaminated soil located in restricted access areas is removed until the soil tests no higher than 25 ppm PCB.

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-27. (continued)	Verify that the area is then backfilled with clean soil containing less than 1 ppm PCB. 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. Verify that the area is then backfilled with clean soil containing less than 1 ppm PCB.
KO.11-28. Installations should clean up spills in accordance with good practice (MP).	Determine whether any of the following types of spills have occurred: (1)(2)(3) - high-concentration spills - low-concentration spills involving 0.45 kg [1 lb] or more of PCBs by weight - spills of 1023 L [270 gal] or more of untested mineral oil. Verify that the following actions are taken within 24 h of discovering the spill: - the area of the spill is cordoned off or otherwise identified to include the area with visible traces of the spill and a 2-ft [≈61 cm] buffer zone - clearly visible signs are placed advising people to avoid the area - the area of visible contamination is recorded and documented, identifying the extent and center of the spill - cleanup of visible traces of the fluid from hard surfaces is initiated - removal of all visible traces of the spill on soil and other media, such as gravel, sand, etc., is started. (NOTE: If there are no visible traces, the area of the spill may be estimated.) Verify that, if the spill occurs in an outdoor substation: - contaminated solid surfaces are cleaned to a PCB concentration of 100 $\mu g/cm^2$ [≈0.16 $in.^2$] (as measured by standard wipe tests) - soil contaminated by the spill is cleaned to either 25 ppm PCB by weight or 50 ppm PCB - postcleanup samples are collected. (NOTE: The installation may choose the level to which cleanup is conducted if notice is placed in the area to indicate the level of cleanup.)

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-28. (continued)	Verify that, if the spill occurs in a restricted access area other than an outdoor substation: - high-contact solid surfaces are cleaned to 10 μg per 100 cm^2 [≈15 $in.^2$] (as measured by standard wipe tests) - low-contact, indoor, impervious solid surfaces are decontaminated to 10 μg per 100 cm^2 [≈15 $in.^2$] - low-contact, indoor, nonimpervious surfaces are cleaned to either 10 or 100 μg per 100 cm^2 [≈15 $in.^2$] and encapsulated at the option of the installation - low-contact, outdoor surfaces (both impervious and nonimpervious) are cleaned to 100 μg per 100 cm^2 [≈15 $in.^2$] - soil contaminated by the spill is cleaned to 25 ppm PCB by weight - postcleanup samples are collected. Verify that spills in nonrestricted access locations are decontaminated as follows: - furnishings, toys, and other easily replaceable household items are disposed of and replaced - indoor solid surfaces and high-contact, outdoor solid surfaces are cleaned to 10 μg per 100 cm^2 [≈15 $in.^2$] (as measured by standard wipe tests) - indoor vault areas and low-contact, outdoor, impervious solid surfaces are decontaminated to 10 μg per 100 cm^2 [≈15 $in.^2$] - at the option of the installation, low-contact, outdoor, nonimpervious solid surfaces are cleaned to either 10 or 100 μg per 100 cm^2 [≈15 $in.^2$] and encapsulated - soil is decontaminated to 10 ppm PCB by weight provided that the soil is excavated to a minimum depth of 25 cm or 10 in. [≈25 cm] and replaced with clean soil - postcleanup samples are taken. Verify that records documenting all cleanup and decontamination are maintained for 5 yr. (NOTE: Neither the occurrence/discovery of the spill on the weekend nor overtime costs are considered acceptable reasons for delaying response.) (NOTE: The final numerical cleanup standards do not apply to spills directly into surface waters, drinking water, sewers, grazing lands, and vegetable gardens.)

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REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
PCB Storage	
KO.11-29. PCBs and PCB items at concentrations greater than 50 ppm that are to be stored before disposal must be stored in a facility that will ensure the containment of PCBs (FGS-ROK, Chapter 14, Criteria 3d(1) through 3d(3)).	Verify that PCB storage areas meet the following requirements: (1)(3) - the roof and walls of the building in which the PCBs are stored are constructed so as to prevent rainfall from contacting PCBs and PCB items - a 15 cm (6 in.) containment berm surrounds the entire area in which PCBs or PCB items are stored. - berming provides effective containment for twice the internal volume of the largest PCB article or 25 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 that would allow liquids to flow from the bermed area are not present - floors are constructed of continuous, smooth, and impervious material. 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. (NOTE: The following items may be stored for up to 30 days from the date of removal from service in areas that do not meet the above requirements: - nonleaking PCB articles and PCB equipment - leaking PCB articles and PCB equipment placed in a nonleaking PCB container that contains sufficient sorbent material to absorb liquid contained on the PCB article or equipment - PCB containers in which nonliquid PCBs have been placed - PCB containers in which liquid PCBs at a concentration between 50 and 500 ppm have been placed when containers are marked to indicate 500 ppm or less PCB.) Verify that the above items are inspected weekly while in temporary storage. (NOTE: Nonleaking and structurally undamaged large, high-voltage PCB capacitors and PCB-contaminated electric equipment that have not been drained of free-flowing dielectric fluid may be stored on pallets next to a storage area that meets the requirements above.) Verify that the above nonleaking items are inspected weekly.
KO.11-30. Installations must inspect all other storage areas than the above at least monthly (FGS-ROK, Chapter 14, Criterion 3d(4)).	Verify that all storage areas other than those covered by FGS-ROK, Chapter 14, Criteria 3d(1) through 3d(3) (see checklist item KO.11-29) are inspected monthly. (3)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-31. PCB storage must be in UN packaging Group II containers (FGS-ROK, Chapter 14, Criterion 3d(5)).	Verify that containers used for the storage of PCBs are UN packaging Group II containers. (3)
PCB Disposal	
KO.11-32. Installations must return DOD-generated PCBs manufactured in the United States to the Continental United States (CONUS) for delivery to a permitted disposal facility under certain conditions (FGS-ROK, Chapter 14, Criterion 3e(5)).	Determine whether host nation or third-country disposal of DOD-generated PCBs manufactured in the United States is not possible, is prohibited, or will not be managed in an environmentally sound manner. (3)(5)(6) Verify that the installation returns DOD-generated PCBs manufactured in the United States to the CONUS for delivery to a permitted disposal facility in the above circumstances.
KO.11-33. Installations that generate PCB waste of 50 ppm or greater PCB must maintain an audit trail for the waste (FGS-ROK, Chapter 14, Criterion 3e(1)).	Verify that the installation maintains an audit trail at least as stringent as the audit trail required for hazardous waste. (1)(3)(5)(6)
KO.11-34. Installations must dispose of PCB Items through the DRMO only (FGS-ROK, Chapter 14, Criterion 3e(2)).	Verify that all PCB items are disposed of through the DRMO. (1)(3)(4)(5)(6)
KO.11-35. Installations must dispose of PCB-contaminated liquids in accordance with specific requirements (FGS-ROK, Chapter 14, Criterion 3e(3)).	Verify that PCB-contaminated dielectric fluids with concentrations of greater than 500 ppm are disposed of in an incinerator with 99.9 percent combustion efficiency. (4)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-36. PCB or PCB-contaminated transformers, PCB articles, PCB containers, rags, soils, and other debris contaminated with PCBs at concentrations greater than 50 ppm must be incinerated (FGS-ROK, Chapter 14, Criterion 3e(4)).	Verify that such items with PCBs at concentrations greater than 50 ppm are disposed of in a high temperature incinerator with at least a 99.9 percent combustion efficiency. (3)(4) (NOTE: EPA-600/4-87-045, *The Determination of Polychlorinated Biphenyls in Transformer Fluid and Waste Oils*, is used to establish PCB concentrations.)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ASBESTOS MANAGEMENT **All Installations**	
KO.11-37. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.11-38. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 32-1052, *Facility Asbestos Management,* 22 March 1994 - AFOSH Standard 161-4, *Exposure to Asbestos,* January 1980. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.11-39. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether new regulations concerning asbestos management have been issued since the finalization of the manual. (1)(2)(11) Verify that the installation is in compliance with newly issued regulations.
General	
KO.11-40. Installations must appoint an asbestos program manager (FGS-ROK, Chapter 15, Criterion 3a).	Verify that the installation has an asbestos program manager who serves as the single point of contact for all asbestos-related activities. (1)(9)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-41. Installations must prepare and implement a written asbestos management plan that meets specific minimum requirements (FGS-ROK, Chapter 15, Criterion 3b and AFI 32-1052, paras 2.4 and 5).	Verify that the installation has prepared and implemented a written asbestos management plan. (1)(9)(10) Verify that, at a minimum, the plan addresses the following: - 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 ACM surveillance to note, assess, and document any changes in the ACM's condition - work control/permit systems to control activities which might disturb ACM - operations and maintenance (O&M) work practices to avoid or minimize fiber release during activities affecting ACM - recordkeeping to document O&M activities related to asbestos identification, management, and abatement - medical and respiratory protection programs, as applicable - training for the asbestos program manager and custodial and maintenance staff - procedures to assess and prioritize identified hazards for abatement. (NOTE: According to AFI 32-1052, para 5, the objective of the asbestos management plan is to maintain a permanent record of the current status and condition of all asbestos containing material in an installation's facility inventory.) (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.)
KO.11-42. Installations must have a written asbestos operating plan that meets specific minimum requirements (AFI 32-1052, paras 2.4 and 6).	Verify that the installation has prepared and implemented an asbestos operating plan. (1)(9)(10) Verify that the operating plan: - assigns responsibilities - establishes inspection and repair capabilities - provides repair procedures and personnel protection instructions - explains applicable USEPA and Occupational Safety and Health Administration (OSHA) rules, Air Force Policy Directive (AFPD) 32-70, and AFI 91-301.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-42. (continued)	Verify that the operating plan addresses: - the organizational structure for carrying out asbestos-related work - personnel training programs - equipment and supply requirements - identification of worker manuals or other written procedures - yearly budget estimates - procedures for interim control measures and extraordinary precautions - procedures for asbestos certification and asbestos disposition statements on programming documents - requirements for a special response team and in-house inspection capability - contractor requirements to perform analytical work and asbestos abatement.
KO.11-43. Installations must repair or remove damaged ACM and monitor friable ACM (AFI 32-1052, para 2.1 and 2.3).	Verify that damaged ACM is removed or repaired. (1)(9)(10) Verify that friable asbestos is routinely inspected by reviewing inspection logs. (NOTE: Damaged ACM is presumed to be hazardous because of its potential to release airborne asbestos fibers.)
KO.11-44. Friable materials that may be contaminated with asbestos should be tested (MP).	Verify that friable materials that are suspected of being contaminated are tested when located in areas where workers might be exposed. (1)(9)(10)
KO.11-45. Installations must include complete removal of ACM in planning operations and maintenance and military construction program facility projects (AFI 32-1052, para 2.2.3).	Verify that the installation includes complete removal of ACM in planning operations and maintenance and military construction program facility projects, when safety and budgetary considerations permit. (1)(9)(10)
KO.11-46. Installations must remove existing ACM at opportune times during minor construction or repairs (AFI 32-1052, para 2.2.4).	Verify that the installation removes existing ACM at opportune times during minor construction or repairs. (1)(9)(10) (NOTE: This can be verified by reviewing written documentation in the installation's Asbestos Management Plan.)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Personnel Safety	
KO.11-47. Installations should provide personnel working with asbestos with proper education and training (MP).	Verify that workers are provided with appropriate training. (1)(9)(10) Verify that a procedure exists to notify individuals occupationally exposed to asbestos.
KO.11-48. The installation must not expose employees, visitors, or contractors to airborne asbestos concentrations above the PEL without appropriate personal protective equipment (PPE) (FGS-ROK, Chapter 15, Criterion 3c).	Verify that individuals are not exposed to airborne asbestos concentrations above the PEL unless they wear appropriate PPE. (1)(9)(10)
Renovation and Demolition	
KO.11-49. Prior to renovation or demolition, the installation must determine whether ACM will be removed or disturbed and record the determination in the project authorization document (work order) (FGS-ROK, Chapter 15, Criterion 3d).	Verify that facilities are surveyed for ACM prior to renovation and/or demolition and that the determination of action is noted on the work order. (1)(7)(9)(10)
KO.11-50. An asbestos survey report must be prepared and furnished to the Installation Commander or designated representative prior to certain actions (FGS-ROK, Chapter 15, Criterion 3e).	Verify that an asbestos survey report is produced prior to the demolition or renovation of a facility that involves removing or disturbing ACM. (9)(10) Verify that a copy of the written assessment is kept on file permanently.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-51. Installations must remove certain types of ACM prior to any renovation or demolition (FGS-ROK, Chapter 15, Criterion 3g).	Verify that, before renovating or demolishing any facility or any part of a facility in which ACM is found, the installation removes: (9)(10) - all friable ACM - nonfriable ACM with a high degree of probability of becoming friable once disturbed.
KO.11-52. Installations must remove ACM when it poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated (FGS-ROK, Chapter 15, Criterion 3f).	Verify that asbestos that poses a threat has been removed. (9)(10) (NOTE: Asbestos should not be removed for the sole purpose of eliminating asbestos.)
KO.11-53. Installations must meet specific criteria before and during the in-house abatement of asbestos (FGS-ROK, Chapter 15, Criterion 3h).	Verify that the installation uses contracting for asbestos abatement, unless in-house performance is adequately justified and funded and personnel are adequately trained and certified. (1)(7)(9)(10) Determine whether the installation carries out in-house abatement of asbestos. Verify that all workers are trained prior to the removal. Verify that monitoring programs are in place during asbestos removal to document exposure levels. Verify that all workers involved in the removal 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 that has the potential to release airborne asbestos fibers in concentrations greater than the PEL of 0.1 fibers/cc.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Asbestos Disposal	
KO.11-54. Installations must dispose of asbestos-containing waste materials in accordance with specific standards (FGS-ROK, Chapter 15, Criterion 3i).	Verify that all ACM waste is adequately wetted, sealed in a leak-proof container, and properly disposed of in a stabilization landfill as defined in Section 9, *Solid Waste Management.* (1)(9)(10) Verify that containers are labeled in English and the language of the Republic of Korea: DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD. Verify that permanent records are maintained that document the disposal action and site.
KO.11-55. Active waste disposal sites where ACM is being disposed of should meet specific standards (MP).	Determine whether the installation operates a landfill where asbestos is being disposed of. (1)(2) Verify that there are no visible emissions from active asbestos-containing waste disposal sites, or that: - at the end of each operating day, or once in a 24-h period, the waste material is covered with either at least 15 cm (6 in.) of compacted non-ACM, or - a resinous or petroleum based dust suppression agent is applied (waste crankcase oil is not suitable for this purpose), or - an approved alternative method of control is used. Verify that the waste is either properly covered daily by non-ACM or that proper warning signs and fences are installed and maintained as follows: - warning signs are displayed at all entrances at intervals of 100 m (330 ft) or less along the property line of the site or the perimeter of the section of the site where ACMs are disposed of and the signs state that the site contains asbestos and warn against creating dust - the area is adequately fenced. (NOTE: This requirement does not apply if a natural barrier exists that deters access by the general public.) Verify that a record is kept of the location, depth, and area of asbestos-containing waste on a map or diagram of the disposal area.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-56. Inactive waste disposal sites should meet specific standards (MP).	Verify that inactive waste disposal sites meet one of the following criteria: (1)(2) - no visible emissions are discharged - asbestos-containing waste material (ACWM) is covered with at least 15 cm (6 in.) of compacted non-ACM, and a vegetation cover is grown and maintained (in desert areas where vegetation is difficult to maintain, at least 8 cm (3 in.) of additional well-graded, nonasbestos-containing crushed rock may be used instead) - the ACWM is covered with at least 60 cm (2 ft) of non-ACM, and the cover is maintained to prevent exposure. Verify that warning signs and a fence are installed to deter public access. (NOTE: This requirement does not apply if a natural barrier to public access exists.) Verify that easily legible warning signs are displayed at all entrances and at intervals of 100 m (330 ft) or less that indicate that the area is an asbestos waste disposal site. Verify that a procedure is in place to notify the administrator in writing at least 45 days prior to excavating or disturbing any ACWM at an inactive waste disposal site.
Asbestos in Schools	
KO.11-57. DOD Dependents Schools (DODDSs) must meet specific requirements with regard to ACM (FGS-ROK, Chapter 15, Criterion 3j).	Verify that both friable and nonfriable ACM have been identified in elementary and secondary schools. (8)(9) Verify that all suspect materials that are not confirmed to be ACM have been sampled. Verify that samples are analyzed using appropriate techniques. Verify that a certified inspector has provided a written analysis of all friable, known, or assumed ACM in school buildings. Verify that appropriate response actions are selected and implemented in a timely manner to protect human health and the environment. 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. Verify that each school has an asbestos management plan that includes all leased or owned facilities. (NOTE: The DODDS asbestos management plan could be part of the installation asbestos management plan.)

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
RADON MANAGEMENT **All Installations**	
KO.11-58. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.11-59. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulation is maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.11-60. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether new regulations concerning radon management have been issued since the finalization of the manual. (1)(2)(11) Verify that the installation is in compliance with newly issued regulations.
KO.11-61. Installations must prioritize their facilities for radon assessment and mitigation properly (FGS-ROK, Chapter 16, Criterion 3a).	Verify that the installation has prioritized its facilities in accordance with the following list: (1)(2) - 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 2 h/day.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-62. Initial screening samples must be collected from facilities in accordance with a specific schedule (FGS-ROK, Chapter 16, Criterion 3b).	Verify that the installation has collected initial screening samples from selected priority 1 facilities before 1 October 1995. (1)(2) (NOTE: Priority 2 and 3 facilities are not involved in the initial screening program.) Verify that the samples are collected according to a protocol that yields a statistically representative sample.
KO.11-63. Installations that have only Priority 2 and 3 facilities must conduct radon screening to obtain a statistically representative sample by 1 January 1996 (FGS-ROK, Chapter 16, Criterion 3d).	Determine whether the installation has only Priority 2 and 3 buildings. (1)(2) Verify that radon screening is being carried out so that a sample is ready by 1 January 1996.
KO.11-64. Detailed testing for radon is required if any initial screening sample results indicate a radon concentration greater than 4 pCi/L [148 Bq/m^3] (FGS-ROK, Chapter 16, Criterion 3c).	Verify that, if any initial screening sample shows a radon level greater than 4 pCi/L [148 Bq/m^3], 12-mo radon samples are collected from all Priority 1, 2, and 3 facilities. (1)(2)
KO.11-65. Installations must have a QA/QC program to ensure the validity of test results (FGS-ROK, Chapter 16, Criterion 3f).	Verify that the installation has a QA/QC program to ensure the validity of radon test results. (1)(2)
KO.11-66. Installations must mitigate certain facilities according to a specific schedule (FGS-ROK, Chapter 16, Criterion 3e).	Verify that the installation mitigates facilities that have radon levels above 4 pCi/L [148 Bq/m^3]. (1)(2) Verify that the radon mitigation of such facilities proceeds according to the schedule in Table 11-2.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-67. Installations must have post-mitigation monitoring programs (FGS-ROK, Chapter 16, Criterion 3h).	Verify that the installation has a post-mitigation monitoring program to confirm and document the effectiveness of mitigation. (1)(2)
KO.11-68. Installations should maintain or have access to a database that will permanently capture all the information derived from the assessment and mitigation of radon (MP).	Verify that the installation maintains or has access to such a database. (1)(2) Verify that all pertinent radon information is contained in such a database.
KO.11-69. 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-ROK, Chapter 16, Criterion 3g).	Verify that the installation has developed an information packet on radon. (1)(2) Verify that the packet and the radon monitoring results are given to facility occupants upon assignment.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
LEAD-BASED PAINT (LBP) **All Installations**	
KO.11-70. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)
KO.11-71. Copies of all relevant DOD and AF directive, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulation is maintained and kept current at the installation: (1)(11) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995. - HQ USAF/CC Policy Letter, *Air Force Policy and Guidance on Lead Based Paint in Facilities*, 24 May 1993. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base EPC.
KO.11-72. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning LBP have been issued since the finalization of the manual. (1)(2)(11) Verify that the installation is in compliance with newly issued regulations.
KO.11-73. Installations must develop and implement a plan for identifying, evaluating, managing, and abating LBP hazards (HQ USAF/CC Policy Letter 24 May 1993, para 6).	Verify that the installation has a management plan that includes a strategy for: (1) - identifying, evaluating, controlling, and eliminating existing LBP hazards and preventing new hazards from developing - protecting facility occupants, especially children, and workers from LBP hazards - ensuring compliance with all applicable environmental protection requirements and all laws and regulations pertaining to LBP activities.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-73. (continued)	Verify that the plan: - is an integral part of the installation's overall plan for inspecting, constructing, upgrading, repairing, maintaining, and demolishing the facility inventory - is based on local conditions and an evaluation of the health risk from LBP onbase that considers available information on the conditions of the facilities, the results of facility inspections and evaluations, and incidents of lead toxicity resulting from LBP - gives priority to finding and reducing or eliminating the risk of existing hazardous conditions in high-priority facilities - emphasizes in-place management to control existing hazards and reduce the risk of hazardous exposure to acceptable levels - considers abatement of LBP as part of the normal facility renovation and upgrade programs when it is cost-effective - ensures precautions and procedures are incorporated into all maintenance, repair, renovation, and upgrade activities that are performed in-house, by contract, or self-help and that disturb painted surfaces known or likely to contain lead.
KO.11-74. Installations must identify existing and potential LBP hazards in accordance with specific procedures (USAF/CC Policy Letter 24 May 1993, para 7).	Verify that, depending on local circumstances, one of the following is used to identify and evaluate existing and potential LBP hazards: (1) - evaluations of observations from routine facility inspections and activities such as walk-throughs by Public Health (PH), fire and safety inspections, inspections for family day care home licensing, and occupant reports of deteriorated paint - inspections and evaluations specifically designed to locate existing and potential LBP hazards so that appropriate measures can be taken to avoid hazardous lead exposures - facility investigations to determine the source of documented lead exposure. Verify that facility personnel who conduct routine inspections have been instructed to report signs of paint deterioration or children chewing on painted surfaces in high-priority facilities. Verify that there are procedures in place to document and respond to information reported from inspections and occupants concerning potential LBP problems and the resulting evaluations and actions.

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COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-74. (continued)	Verify that facility inspections that are done specifically to identify LBP problems meet the following requirements: - they are focused on high-priority facilities and areas within those facilities with painted surfaces in deteriorated condition - the evaluations are performed by a team consisting of PH and BES representatives or by a qualified contractor - reports of the data results and resulting actions are collected, consolidated, and analyzed by the Chief, Aerospace Medicine for reporting through AF medical channels - permanent records of facility evaluations are maintained by the BCE and/or BES.
KO.11-75. Installations must determine whether LBP is present prior to the start of facility maintenance, repair, modification, and renovation activities (HQ USAF/CC Policy Letter 24 May 1993, para 11).	Verify that the installation determines whether LBP is present prior to the start of maintenance, modification, or renovation activities. (1)(2) (NOTE: This requirement applies to high priority facilities and other facilities likely to contain lead.)
KO.11-76. Installations must restrict the use of LBP (USAF/CC Policy Letter 24 May 1993, para 12).	Verify that the installation does not use paint with more than 0.06 percent lead by weight of the nonvolatile solids. (1) (NOTE: This restriction applies to all facilities, both industrial and nonindustrial.)
KO.11-77. AF personnel who perform tests for LBP and work on painted surfaces must be trained (USAF/CC Policy Letter 24 May 1993, para 13).	Verify that at least one person from BCE has received USEPA certification. (1) Verify that all training is conducted by persons who have been trained at a USEPA-approved Regional Lead Training Center or an equivalent in-house training program presented by a certified trainer. (NOTE: The person from BCE who received USEPA certification may train other installation personnel on potential hazards and proper precautions.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Exterior Electric Shop) (4) DRMO (Defense Reutilization and Marketing Office) (5) BCE (Contract Programmer) (6) BCE (Contract Management) (7) BCE (Chief of Operations and Maintenance) (8) School Principal (9) Asbestos Program Officer (10) Asbestos Operating Officer (11) Base Staff Judge Advocate (12) Base Safety Officer (13) PAO (Public Affairs Officer)

COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.11-77. (continued)	Verify that a minimum level of training that includes the following is provided for all workers who perform tasks that disturb painted surfaces: - potential hazards of LBP (hazard communication) - work practices to reduce and control dust and debris - handling of debris - hygiene - cleanup procedures.
KO.11-78. Certain personnel must receive training beyond the minimum level (USAF/CC Policy Letter 24 May 1993, para 13).	Verify that the following personnel receive additional training in the requirements of the *Occupational Safety and Health Act* and those of the Department of Housing and Urban Development: (1) - personnel who perform larger jobs in which simple work practices will not reliably reduce or control dust - personnel who assist in LBP evaluations.
KO.11-79. All training related to LBP must be documented (USAF/CC Policy Letter 24 May 1993, para 13).	Verify that all training is documented in official personnel folders. (1)
KO.11-80. Installations must perform a Lead Toxicity Investigation (LTI) when children with elevated blood lead levels have been identified at the installation (USAF/CC Policy Letter, 24 May 1993, para 14).	Determine whether the installation has ever had a case of elevated levels of lead in the blood. (2) Verify that the LTI team consists of representatives from BCE, BES, PH, PAO, and SJA as needed. Verify that the installation conducted an LTI.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Exterior Electric Shop) (4) DRMO (Defense Reutilization and Marketing Office) (5) BCE (Contract Programmer) (6) BCE (Contract Management) (7) BCE (Chief of Operations and Maintenance) (8) School Principal (9) Asbestos Program Officer (10) Asbestos Operating Officer (11) Base Staff Judge Advocate (12) Base Safety Officer (13) PAO (Public Affairs Officer)

Table 11-1

Summary of Likelihood of Lead-Based Paint Being Present and Regulation/Guidelines Which Normally Must Be Followed

(USAF/CC Policy Letter 24 May 1993)

High-Priority Facilities

Facility Type	LBP Likely	HUD	OSHA	RCRA	AIR
MFH/Day Care Home, Before 1980	Yes	Yes	Yes	Yes	No
MFH/Day Care Home, During/After 1980	No	Yes	No	No	No
Other High Priority Facilities Before 1980	Yes	Yes	Yes	Yes	No
Other High Priority Facilities During/After 1980, Ferrous Metal Surface	Yes*	Yes	Yes	Yes	No
Other High Priority Facilities, During/After 1980, Other Surfaces	No**	Yes	No	No	No

Other Facilities (Not High-Priority)

Facility Type	LBP Likely	HUD	OSHA	RCRA	AIR
Steel Structures	Yes	No	Yes	Yes	Yes
Industrials	Yes	No	Yes	Yes	No
Painted Yellow Pavement Markings	Yes	No	Yes	Yes	No
Nonindustrials, Ferrous Metal Surfaces	Yes*	No	Yes	Yes	No
Nonindustrials, During/After 1980, Other Surfaces	No**	No	No	No	No

* *Consumer Product Safety Act* (CPSA) restrictions uncertain but common practices favor lead present.

** CPSA restriction uncertain but common practices favor lead absent.

HUD - Housing and Urban Development Interim Guidelines

OSHA - Occupational Safety and Health Administration

RCRA - *Resource Conservation and Recovery Act*

(continued)

Table 11-1 (continued)

AIR - National Primary and Secondary Ambient Air Quality Standards

CPSA - *Consumer Product Safety Act*

(NOTE: Likelihood of finding LBP on a particular surface in a facility is based on when it was constructed (before 1980 or during/after 1980), applicability of CPSA restrictions on use of LBP, and common painting practices.)

(NOTE: Although LBP may not be likely, some precautions described in the HUD guidelines will normally be considered in high priority facilities since children are potentially at risk and there is some possibility the LBP is present.)

Table 11-2

Radon Mitigation Schedule

(FGS-ROK, Table 16-1)

Radon Level (pCi/L)	Mitigation Within:
Greater than 200	1 mo of sample results or move occupants
200 or less, but greater than 20	6 mo of sample results
20 or less, but greater than 8	4 yr
8 or less, but greater than 4	5 yr
4 or less	No action required

INSTALLATION:	COMPLIANCE CATEGORY: TOXIC SUBSTANCES MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 12

WASTEWATER MANAGEMENT

Korea ECAMP

SECTION 12

WASTEWATER MANAGEMENT

A. Applicability of this Section

This section identifies regulations, responsibilities, and compliance requirements applicable to all wastewater management and discharge on Air Force (AF) installations, including activities and procedures involved in the collection, treatment, and discharge of wastewater.

The regulations, responsibilities, and compliance requirements associated with wastewater discharge at AF installations include, but are not limited to, the following examples:

- sanitary or industrial wastewater discharged directly to a receiving stream or through an onbase treatment facility
- sanitary or industrial wastewater discharge to an offbase publicly owned treatment works (POTW) or to a treatment plant of another Department of Defense (DOD) activity
- stormwater runoff from industrialized areas of the installation to a receiving stream or water body.

Most AF installations have wastewater discharge of one type or another; therefore, this section will be applicable to most installations.

The regulatory requirements in this section are based on DOD regulations and Air Force Instructions (AFIs) that apply at overseas installations. Management Practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 4 contains criteria to control and regulate discharges of wastewaters into surface waters. It also addresses domestic and industrial wastewater discharges and pollutants from indirect dischargers.

C. U.S. Air Force Documents

- AFI 32-1067, *Water Systems,* 25 March 1994, provides guidelines for managing water and wastewater systems at AF installations.

- AFI 48-119, *Medical Service Environmental Quality Program,* 25 July 1994, provides directive requirements for the Medical Service Environmental Quality Program and identifies responsibilities of participants in that program at AF installations.

- Air Force Manual (AFM) 91-32, *Operation and Maintenance of Domestic and Industrial Wastewater Systems,* specifies detailed operation and maintenance guidelines and requirements for treatment works on AF installations. In particular, requirements for maintenance of operating logs, maps, and records are specified in this AFM.

- HQ USAF/CE Letter, *Oil/Water Separators Operations, Maintenance, and Construction,* 21 October 1994, outlines requirements for the management of existing oil/water separators and the construction of new ones.

D. Responsibility for Compliance

- Training of operating personnel to meet proficiency levels consistent with the operator certification requirements that apply to their location is the responsibility of the BCE. The BCE is also responsible for monitoring compliance with, and reporting deviations from, minimum standards outlined in host nation wastewater discharge permits (or equivalents). The BCE's design departments are responsible for the design and construction of wastewater collection and treatment systems as needed on the installation.

- Bioenvironmental Engineering Services (BES) is responsible for monitoring wastewater discharge and streamwater quality at selected locations around the installation and for characterizing discharges.

- Individual Shop Supervisors and Superintendents are responsible for ensuring that the prohibited, unpermitted discharge of wastewater containing toxic or hazardous substances into sanitary or stormwater systems does not occur on the installation.

- The Water and Waste Shop within BCE is responsible for operating and maintaining sewer lines, pretreatment facilities, pump stations, oil/water separators, and other associated facilities around the installation and for taking timely and appropriate corrective actions when deficiencies are discovered.

E. Definitions

- *Average Monthly Discharge Limitations* - the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (FGS-ROK, Chapter 4, Definitions).

- *Average Weekly Discharge Limitations* - the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week (FGS-ROK, Chapter 4, Definitions).

- *BOD_5* - the five-day measure of the pollutant parameter biochemical oxygen demand (FGS-ROK, Chapter 4, Definitions).

- *COD* - a measure of the oxygen consuming capacity of the organic matter present in wastewater, chemical oxygen demand (FGS-ROK, Chapter 4, Definitions).

- *Conventional Pollutants* - BOD_5, total suspended solids (TSS), oil and grease, fecal coliforms, and pH (FGS-ROK, 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-ROK, Chapter 4, Definitions).

- *Direct Discharge* - any discharge of pollutants other than an indirect discharge (FGS-ROK, Chapter 4, Definitions).

- *Discharge of a Pollutant* - any addition of any pollutant or combination of pollutants to waters of the ROK from any point source (FGS-ROK, Chapter 4, Definitions).

- *Domestic Wastewater Treatment Plant (DWWTP)* - any USFK or ROK facility designed to treat wastewater before its discharge to waters of the ROK and in which the majority of such wastewater is made up of domestic sewage (FGS-ROK, Chapter 4, Definitions).

- *Effluent Limitation* - any restriction imposed on quantities, discharge rates, and concentrations of pollutants that are ultimately discharged from point sources into waters of the ROK (FGS-ROK, Chapter 4, Definitions).

- *Existing Source* - a source that discharges pollutants that was in operation or under construction prior to 1 January 1996 (FGS-ROK, Chapter 4, Definitions).

- *Grab Sample* - a single sample taken from a specific point and time (FGS-ROK, Chapter 4, Definitions).

- *Indirect Discharge* - the introduction of pollutants in process wastewater to a DWWTP (FGS-ROK, Chapter 4, Definitions).

- *Industrial Wastewater Treatment Plant (IWWTP)* - any USFK facility designed to treat process wastewater before its discharge to waters of the ROK other than a DWWTP (FGS-ROK, Chapter 4, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Maximum Daily Discharge Limitation* - the highest allowable daily discharge (FGS-ROK, Chapter 4, Definitions).

- *New Source* - a source that discharges (FGS-ROK, Chapter 4, Definitions).

- *pH* - an abbreviation of the French term *pouvoir hydrogene*, literally "hydrogen power." It is a measure of the acidity or alkalinity of a solution. Mathematically, it is the negative log to the base ten of the hydrogen ion concentration. In water, the pH values range from 0 (very acidic) to 14 (very alkaline) (FGS-ROK, 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-ROK, 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-ROK, 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-ROK, Chapter 4, Definitions).

- *Regulated Facility* - a facility for which criteria are established under Chapter 4 of FGS-ROK, such as DWWTP, IWWTP, or industrial dischargers (FGS-ROK, Chapter 4, Definitions).

- *Sewer User Fee Areas* - the ROK government established sewer user fees for the cities of Seoul, Pusan, Taegu, and Chunchon, and requested USFK to pay sewer fees for the sewage that is discharged from various USFK installations located in the above cities. The ROK and U.S. Joint Committee of Status of Forces Agreement (SOFA) approved the sewer user fee rates on 3 March 1987 to be effective retroactively to 31 January 1986. These areas have been permitted to discharge their sewage effluent into ROK municipal sewer collection systems without providing secondary wastewater treatment (FGS-ROK, 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-ROK, Chapter 4, Definitions).

- *Total Suspended Solids (TSS)* - the pollutant parameter total filterable suspended solids (FGS-ROK, Chapter 4, Definitions).

- *Total Toxic Organics (TTO)* - the summation of all quantifiable values greater than 0.01 mg/L for the toxic organics (FGS-ROK, Chapter 4, Definitions).

- *Waters of the Republic of Korea* - surface waters including the territorial seas recognized under customary international law, including (FGS-ROK, 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. and tributaries of waters identified above.

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

WASTEWATER MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.12-1 through KO.12-4	(1)(2)(5)
General	KO.12-5 through KO.12-14	(1)(2)(3)
Point Source Discharges	KO.12-15 through KO.12-17	(2)(3)(4)
Discharges to DWWTPs	KO.12-18 through KO.12-23	(1)(2)(3)(4)
Effluent Limitations	KO.12-24 through KO.12-26	(1)(2)
Oil/Water Separators	KO.12-27 through KO.12-29	(1)(4)
Training and Certification	KO.12-30 and KO.12-32	(3)(5)

(a) CONTACT/LOCATION CODE:

(1) BCE (Environmental Planning)
(2) BES (Bioenvironmental Engineering Services)
(3) Wastewater Treatment Plant Superintendent
(4) BCE (Natural Resources Planner)
(5) Base Staff Judge Advocate

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
- Red water inspection records
- Spill Prevention, Control, and Countermeasures (SPCC) Plan
- All records required by SPCC
- Sewage treatment plant operator certification
- Sewer and storm drain layout
- Oil/water separator inventory
- Installation as-built drawings

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

People To Interview

- BCE (Environmental Planning)
- BES (Bioenvironmental Engineering Services)
- Wastewater Treatment Plant Superintendent
- BCE (Natural Resources Planner)
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ALL INSTALLATIONS	
KO.12-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.12-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(5) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFI 48-119, *Medical Service Environmental Quality Program,* 25 July 1994 - AFI 32-1067, *Water Systems*, 25 March 1994 - AFM 91-32, *Operation and Maintenance of Domestic and Industrial Wastewater Systems,* 12 August 1988 - HQ USAF/CE Letter, *Oil/Water Separators Operations, Maintenance, and Construction,* 21 October 1994. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.12-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning water quality have been issued since the finalization of the manual. (1)(5) Verify that the installation is in compliance with newly issued regulations.
KO.12-4. Outside of the continental U.S. (OCONUS) installations must cooperate with foreign regulatory agencies (AFI 32-1067, para 14.1).	Verify that the installation cooperates with foreign regulatory agencies, consistent with host nation agreements. (1)(2)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
GENERAL	(NOTE: It is acceptable to perform effluent analysis either by Korean methods or USEPA methods in order to demonstrate compliance with the allowable pollutant limits in this protocol.)
KO.12-5. BES must conduct periodic evaluations of the treatment works' compliance with applicable standards (AFI 32-1067, para 4.4).	Verify that BES conducts periodic evaluations of compliance with applicable standards. (2)
KO.12-6. BES must characterize and monitor certain discharges for compliance (AFI 48-119, para 9.4.1).	Verify that BES performs stormwater, point and nonpoint ambient water discharge and injection well discharge (groundwater) characterization and compliance monitoring. (2)
KO.12-7. BES must develop and maintain stream emission inventories (AFI 48-119, para 9.4.1).	Verify that BES develops and maintains stream emission inventories. (2)
KO.12-8. BES must permanently identify all environmental monitoring points and maintain a master record of all locations (AFI 48-119, para 9.4.1).	Verify that BES has permanently identified all environmental monitoring points. (3) Verify that BES maintains a master record of all locations.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**

KO.12-9. Major treatment works must have plant-specific O&M manuals (AFI 32-1067, para 7.3.1).	Verify that the installation's major treatment works have plant-specific O&M manuals. (3)
	
	(NOTE: Domestic and industrial wastewater treatment plants are the primary facilities covered by this instruction.)
	
	Verify that, if the facilities are present on the installation, plant-specific manuals address the following areas of concern:
	
	- metal finishing and electroplating
	- vehicle and aircraft wash facilities
	- aircraft maintenance
	  - paint stripping
	  - nondestructive inspection
	  - painting
	  - solvent cleaning
	- battery shops
	- photo labs
	- hospitals
	- aircraft deicing
	- fire training.
	
	Verify that plant-specific manuals address the proper operation and maintenance of oil/water separators and lift stations.

KO.12-10. Specific physical facility information must be developed, maintained, and kept available at treatment facilities (AFI 32-1067, para 10.2).	Verify that the following information is developed, maintained, and kept available at the treatment facilities: (1)(3) - required plant-specific O&M manuals and applicable AF publications - system operating instructions with single-line drawings, including operational and compliance monitoring procedures - up-to-date system as-built drawings along with other system plans and blueprints, including hydraulic water elevation profiles and a drawing of the entire collection and distribution systems - shop drawings, catalogue cuts, and any other equipment information or literature.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.12-11. Installations must develop and maintain effective maintenance plans that address specific topics (AFI 32-1067, para 10.3).	Verify that the installation develops and maintains effective maintenance plans that include: (1) - a recurring work schedule - a maintenance history for each major piece of equipment - an essential spare parts list, with spare parts stocked at the t.eatment facility or other accessible location - a long-range maintenance and improvement plan.
KO.12-12. Each installation must have a system for investigating water pollution complaints from individuals or ROK water pollution control authorities (FGS-ROK, Chapter 4, Criterion 3d).	Verify that the installation has procedures for investigating water pollution complaints. (3) (NOTE: The Environmental Subcommittee under ROK and the U.S. SOFA Joint Committee may be involved, as appropriate.)
KO.12-13. Operators of treatment works must prepare pollution control logs (AFI 32-1067, para 10.1.2).	Verify that operators prepare the following forms: (3) - AF Form 1462, *Water Pollution Control Utility Operating Log (General)* - AF Form 1463, *Water Pollution Control Plant Operating Log--Supplementary.*
KO.12-14. All sludges produced during the treatment of wastewater must be disposed of in accordance with relevant standards (FGS-ROK, Chapter 4, Criterion 3g).	Verify that the installation determines whether the sludge from the wastewater treatment plant are hazardous or not. (1)(2)(3) (NOTE: See Section 4, *Hazardous Waste Management*, for the definition of hazardous waste.) Verify that sludges that are hazardous are disposed of in accordance with the requirements of Section 4, *Hazardous Waste Management.* Verify that sludges that are not hazardous are disposed of in accordance with the requirements of Section 9, *Solid Waste Management.*

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
POINT SOURCE DISCHARGES	
KO.12-15. All new and existing point source dischargers of pollutants to waters of the Republic of Korea must meet specific domestic wastewater effluent limitations and monitoring requirements (FGS-ROK, Chapter 4, Criteria 3a).	Verify that all new and existing sources of pollutants to waters of the Republic of Korea comply with the effluent limitations listed in Table 12-1. (2)(3) Verify that samples for monitoring are collected at the point of discharge prior to any mixing with the receiving water. Verify that all regulated parameters (BOD_5, TSS, pH) are sampled and monitored in accordance with the frequency listed in Table 12-2.
KO.12-16. Samples of wastewater discharges should be processed using proper collection, testing, and shipping procedures (MP).	Verify that, for wastewater sampling: (2)(3) - proper sample containers are used - samples are refrigerated during compositing - proper preservation techniques are used.
KO.12-17. Installations with live fire training facilities that are connected to onsite wastewater treatment plants should discharge the effluent gradually to avoid adverse impact on the wastewater treatment plants (MP).	Verify that there is an effective fuel and water separator. (4) Verify that the fuel and water separator are being properly maintained. Verify that there are self-monitoring reports on fuel and water separators. Verify that wastewater treatment plant discharge is in compliance with permit requirements. Verify that the fuel used for fire training is free from contaminants that can cause adverse environmental impact.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
DISCHARGES TO DWWTPs	(NOTE: These and the following effluent limitations apply to all discharges of pollutants to DWWTPs and associated collection systems.)
KO.12-18. Installations must develop a base standard wastewater treatment procedure to govern the discharge of industrial and nondomestic waste to the sanitary system by generating activities (AFI 32-1067, para 7.3.2).	Verify that the installation has a base standard wastewater treatment procedure to govern the discharge of industrial and nondomestic waste to the sanitary system by generating activities. (1)(3) Verify that BCE outlines procedures for discharging industrial wastes to the sanitary system. Verify that the procedures describe the following: - pretreatment requirements - discharge procedures - effluent limitations for industrial waste. (NOTE: The base commander or the municipal wastewater authority can impose these requirements.) Verify that generators follow the instructions given by BCE.
KO.12-19. Generators must use pollution control techniques to minimize pollutant discharges (AFI 32-1067, para 7.3.2).	Verify that generators of discharges minimize the discharge of pollutants using the pollution control techniques in AFI 32-7080. (1)(3) (NOTE: See the pollution prevention subsection of Section 6, *Other Environmental Issues*.)
KO.12-20. Installations must not discharge certain materials into a treatment works (FGS-ROK, Chapter 4, Criteria 3b(1)(a), 3b(1)(e), and 3b(1)(f)).	Verify that the installation does not discharge any of the following to a DWWTP: (1)(2)(3) - 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. (NOTE: DWWTPs 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.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.12-21. Installations must not introduce specific pollutants into a DWWTP (FGS-ROK, Chapter 4, Criteria 3b(1)(b) through 3b(1)(d)).	Determine whether the installation has been granted any exemptions or variances concerning its discharges. (1)(3) Verify that pollutants that create a fire or explosion hazard in the collection system or treatment facility are not discharged, specifically: - 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. Verify that no pollutant that has the potential to be structurally corrosive is discharged to the DWWTP. Verify that no wastewater with a pH lower than 6.0 is discharged to the DWWTP. (NOTE: This prohibition does not apply if the treatment facilities and collecting systems are designed to handle such wastewater.) Verify that the following types of waste are not discharged: - 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 by FGS-ROK, Chapter 5 - wastes that produce any toxic fumes, vapors, or gases with the potential to cause safety problems or harm to workers.
KO.12-22. Hazardous waste must not be discharged to the collection system (AFI 32-1067, para 7.3.2).	Verify that no hazardous waste is discharged to the collection system. (1)(3)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.12-23. Installations should periodically survey stormwater discharge (MP).	Verify that the installation's stormwater discharges are uncontaminated. (1)(2)(4) (NOTE: The following sites or activities, and records related to them, may reveal problems with stormwater discharges: - the storm sewer system, its outfalls and discharge points - major industrial shops or areas, such as the following: - battery shop - corrosion control - engine shop - motor pool - paint shop - plating shop - petroleum, oil, and lubricant (POL) area.) (NOTE: Signs of contamination include oil sheen, discoloration, etc.) Verify that any oil/water separators connected to the storm sewer on the installation are operating properly.
EFFLUENT LIMITATIONS	
KO.12-24. Installations must meet effluent limitations for direct and indirect discharges (FGS-ROK, Chapter 4, Criterion 3c(1)).	Determine whether the installation has activities that fall into any of the categories in Table 12-3. Verify that the installation complies with the industrial wastewater effluent limitations listed in Table 12-4. (NOTE: Where a difference in limitations exists between new and existing activities, those activities constructed or substantially modified on or after 1 January 1996 must meet the limitations for new activities.)
KO.12-25. Direct discharges from IWWTPs must be monitored quarterly (FGS-ROK, Chapter 4, Criterion 3c(2)(a)).	Verify that monitoring is carried out quarterly and that all the appropriate parameters are analyzed. (1)(2) Verify that samples are collected at the point of discharge after treatment but prior to any mixing with the receiving water. (NOTE: Monitoring includes both sampling and analysis.) (NOTE: Sampling for the toxic organics in Table 12-4 (e.g., polychlorinated biphenyls (PCBs), trichloroethylene, tetrachloroethylene) can be avoided if the commanding officer determines that no discharge of concentrated toxic organics into the wastewaters has occurred and if the facility has implemented a TTO management plan.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.12-26. Indirect discharges to DWWTPs must be monitored triennially (FGS-ROK, Chapter 4, Criterion 3c(2)(b)).	Verify that effluent for the DWWTP is monitored triennially for the pollutants listed in Table 12-4. Verify that, if any pollutant concentration exceeds the limitation, monitoring for that pollutant is performed quarterly until concentration is reduced to below the limitation. Verify that at least two quarterly samples indicate that the concentration is below the limitation before triennial samples are resumed.
OIL/WATER SEPARATORS	
KO.12-27. Existing oil/water separators must be managed in accordance with specific requirements (HQ USAF/CE Oil/Water Separator Letter).	Verify that the installation has developed and implemented a plan to assess the need for and effectiveness of existing oil/water separators. (1)(4) (NOTE: The goal of the assessment/evaluation is to consolidate or eliminate ineffective units.) Verify that an inventory of all oil/water separators has been conducted that identifies: - all sources of pollutants being discharged from the individual shops connected to each separator - the mode of discharge (e.g., to storm sewer, sanitary sewer, septic tank, or direct discharge to the waters of the host nation). (NOTE: For the purposes of this inventory, oil/water separators include on-line oil and grease/fuel traps and small oil/water separators outside of hangers, corrosion control facilities, fuel transfer/storage operations, AGE equipment maintenance shops, wash racks, etc. Mode of discharge includes discharge to storm sewer, septic tank, or direct discharge to the waters of the host nation.) Verify that the separators are identified on the installation as-built drawings. Verify that the drawings are updated as changes occur.
KO.12-28. Installations must operate and maintain oil/water separators in accordance with specific requirements (HQ USAF/CE Letter of 21 October 1994).	Verify that oil/water separator sludge is removed and tested regularly prior to disposal to ensure compliance with sludge disposal requirements. (1) Verify that the discharge of wastewater that contains hazardous wastes and heavy metals from industrial operations is prohibited. Verify that, if sludge is hazardous, immediate action is taken to identify and eliminate sources of hazardous pollutants.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.12-28. (continued)	Verify that, if sludge is disposed of as a hazardous waste, the wastewater is retested to ensure compliance. Verify that there is a primary office of responsibility that understands and has direct control over respective functions. (NOTE: This primary office of responsibility would be a functional organization for the management of pollutants discharged and CE for maintenance of oil/water separators.) Verify that sources discharging to oil/water separators take the following actions: - institute dry cleanup procedures - floor drains are used to carry only residual amounts of floating petroleum pollutants - plug floor drains to oil/water separators that carry industrial wastewater from shops.
KO.12-29. The construction of new oil/water separators is restricted (HQ USAF/CE Letter of 21 October 1994).	Verify that no new separators are built either through Real Property Maintenance or Military Construction projects until the effectiveness of existing separators has been evaluated and a consolidated program has been established. (1) Verify that new separators have a double liner with a leak detection system, including associated oil tanks. Verify that no gravity separators are built for wastewater that contains any of the following: - emulsified petroleum residuals - aqueous film forming foam releases - other nonfloating pollutants from industrial operations. Verify that waste streams that are discharged to sewer systems are not mixed.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
TRAINING AND CERTIFICATION	
KO.12-30. Personnel engaged or employed in operation and maintenance of wastewater treatment facilities must meet USFK certification or training requirements (FGS-ROK, Chapter 4, Criterion 3e).	Verify that such personnel meet the certification and/or training requirements as developed by the USFK Assistant Chief of Staff Engineer. (3)(5)
KO.12-31. Operators of wastewater treatment plants must meet training requirements (AFI 32-1067, para 8.1).	Verify that new operators receive classroom training and extensive supervised on-the-job training before being assigned to critical tasks. (3) Verify that experienced personnel receive technical refresher courses and upgrade training. (NOTE: Training requirements may be met by one of the following means: - AF training available through technical schools, career development correspondence courses, and on-the-job training - civilian training courses available at educational institutions, government agencies, and professional and technical associations - correspondence courses from accredited institutions for operators in areas that do not have local resident courses.)
KO.12-32. Supervisors at wastewater treatment plants must meet specific requirements with regard to safety training for all employees (AFI 32-1067, para 9).	Verify that all employees are familiar with the safety instructions in the following documents, as applicable: (3) - AFM 91-32, *Operation and Maintenance of Domestic and Industrial Wastewater Systems* - Air Force Occupational Safety and Health Standard (AFOSH STD) 127-10, *Civil Engineering* - AFOSH STD 127-25, *Confined Spaces* - AFOSH STD 161-21, *AF Hazard Communication Standard.* Verify that the supervisor maintains current BES baseline and annual industrial hygiene survey reports. (NOTE: The supervisor should use these reports to train workers on occupational health hazards.) Verify that supervisors make safety instructions readily available to all operating personnel.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.12-32. (continued)	Verify that supervisors train facility personnel on safety procedures and equipment and enforce their proper use at all times. (NOTE: Once trained, individual workers are personally responsible for following safe procedures.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) Wastewater Treatment Plant Superintendent (4) BCE (Natural Resources Planner) (5) Base Staff Judge Advocate

Table 12-1

Domestic Wastewater Effluent Limitation

(FGS-ROK Table 4-1)

	BOD_5	TSS	pH
New Sources	30 mg/L	30 mg/L	6.0 - 9.0
Existing Sources	See Table 12-5	60 mg/L	6.0 - 9.0

NOTE: Allowable limits are for a grab sample. Monitoring requirements are listed in Table 12-2.

Table 12-2

Monitoring Requirements for Wastewater

(FGS-ROK Table 4-3)

Plant Capacity in million gallons/day	Monitoring Frequency
0.0 - 0.099	Quarterly
0.1 - 0.99	Monthly
>1.0	Weekly

Table 12-3

Industrial Wastewater Discharge Facilities

(FGS-ROK Table 4-4)

• Transportation facility i. Washing facility: area of 20 m^2 [≈215 ft^2] or larger or water usage of 2 m^3/day [≈71 ft^3/day] or more. ii. Repairing facility: area of 230 m^2 [≈2475 ft^2] or larger. iii. Plating facility: size of 0.1 m^3 [≈3.53 ft^3] or larger. iv. Lubricant-changing facility: total length of dock with 2 m [≈7 ft] or more.
• Laundry facility Washing equipment: size of 2 m^2 [≈21 ft^2] or larger or water usage with 0.5 m^3/h [≈18 ft^3/h] or more.
• Printing facility i. Washing equipment: size of 1 m^3 [≈35 ft^3] or larger or water usage of 0.5 m^3/h [≈18 ft^3/h] or more. ii. Grinding equipment: power of 3 horse power (hp) or more. iii. Photographic plate making equipment: 0.1 m^3 [≈3.53 ft^3] or larger size of manually operated equipment or 1 or more automatic equipment. iv. Plating equipment: size of 0.1 m^3 [≈3.53 ft^3] or larger.
• Photography processing facility i. 1 or more automatic developing equipment. ii. 1 or more automatic printing equipment.
• Social service facility (educational, health, medical, research facilities, etc.) i. Hospital facility: size of 80 beds or more ii. X-ray processing facility: 2 or more X-ray processing equipment.

Table 12-4

Industrial Wastewater Effluent Limitations

(FGS-ROK Table 4-5)

Pollutant Category	Class I and II	Class III, IV, and V
pH	5.8 - 8.6	5.8 - 8.6
Normal nucleic acid substances: mineral oil (mg/L) animal/vegetable oil (mg/L)	 5 or less 30 or less	 5 or less 30 or less
Phenol (mg/L)	3 or less	3 or less
Cyanide (mg/L)	1 or less	1 or less
Chromium (mg/L)	2 or less	2 or less
Soluble iron (mg/L)	10 or less	10 or less
Zinc (mg/L)	5 or less	5 or less
Copper (mg/L)	3 or less	3 or less
Cadmium (mg/L)	0.1 or less	0.1 or less
Mercury (mg/L)	0.005 or less	0.005 or less
Organic phosphorus (mg/L)	1 or less	1 or less
Arsenic (mg/L)	0.5 or less	0.5 or less
Lead (mg/L)	1 or less	1 or less
Hexavalent chromium (mg/L)	0.5 or less	0.5 or less
Soluble manganese (mg/L)	10 or less	10 or less
Fluorine (mg/L)	15 or less	15 or less
PCB (mg/L)	0.003 or less	0.003 or less
Coliform bacteria (numbers/mL)	3000 or less	3000 or less
Temperature (°C)	40 or less	40 or less
Total nitrogen (mg/L)	60 or less	60 or less
Total phosphorus (mg/L)	8 or less	8 or less
Trichloroethylene (mg/L)	0.3 or less	0.3 or less
Tetrachloroethylene (mg/L)	0.1 or less	0.1 or less
Alkyl benzene sulfonate (mg/L)	5 or less	5 or less

(continued)

Table 12-4 (continued)

Pollutant Category	Class I and II	Class III, IV, and V
COD (mg/L)	100 or less	150 or less
TSS (mg/L)	100 or less	150 or less

NOTES:

1. The standards for mineral oil are applied, where the mineral oil and animal/vegetable oil of the normal nucleic acid standards are both generated.
2. Criteria for classification of area is the same as in Table 12-5.
3. Effluent standards for total nitrogen and phosphorus are enforced on the lakes/marshes that are designated by the Minister of Environment, starting 1 January 1996.
4. Effluent standards for Alkyl benzene sulfonate are enforced from 1 January 1996.
5. Use current available analysis methods.

Table 12-5

Existing Sources:
Domestic Wastewater BOD_5 Limitation

(FGS-ROK Table 4-2)

USFK Installation	Stream/River	Class	BOD_5 Limits (mg/L)
Camp Casey Camp Hovey Camp Nimble Camp Castle H-220 Heliport	Shinchon	IV	60
Camp Howze Camp Edwards	Kokrungchon	II	30
Camp Stanton Camp Pelham Camp Garry Owen Camp Giant	Munsanchon	V	60
Camp Greaves Camp Bonifas Camp Liberty Bell Warrior Base	Imchin River (downstream)	II	30
Camp Red Cloud Camp Essayons Camp Falling Water Camp Kyle Camp Sears	Chungryangchon	III	60
Camp Jackson Camp La Guardia	Uijongbu City Sewer	---	---
Camp Stanley	Chungryangchon (upstream)	II	30
Camp Page	Chunchon City Sewer*	---	---
Camp Long	Wonjuchon	IV	60
Camp Eagle	Seom River (upstream)	I	30
Camp Colbern	Han River (Paldang-Tanchon)	I	30
Camp Market	Kulpochon	V	60
K-16	Tanchon	V	60

(continued)

Table 12-5 (continued)

USFK Installation	Stream/River	Class	BOD_5 Limits (mg/L)
Yongsan Garrison Nilbo Barracks Fed Compound Camp Kim Camp Gray	Seoul City Sewer*	---	---
CP Tango	Sangjukchon	I	30
Sungnam Golf Course	Han River (Paldang-Tanchon)	I	10**
Camp Humphreys	Anseongchon	II	30
Camp Carroll	Nakdong River (Kamchon Kumho R)	I	30
Camp Henry Camp Walker Camp George	Taegu City Sewer*	---	---
Camp Hialeah Pusan Storage Area Pier #8	Pusan City Sewer*	---	---
Osan Air Base	Chinwichon (downstream)	III	60
Kunsan Air Base	Kum River (downstream)	III	60
Suwon Air Base	Suwonchon	V	60
Chinhae Navy Base	Chinhae City Combined Sewer/ Chinhae Bay	---	60

NOTES:

1. Class I: Drinking water source (DWS) 1st degree -- usable after primary treatment such as filtration.
2. Class II: DWS 2nd degree/swimming -- usable after secondary treatment such as settling and filtration.
3. Class III: DWS 3rd degree -- usable after tertiary treatment, and Industrial 1st degree -- usable after common treatment and settling.
4. Class IV: Industrial 2nd degree/Agricultural -- usable after complete treatment and chemical treatment.
5. Class V: Industrial 3rd degree -- usable after chemical treatment.
6. * Sewer User Fee Areas.
7. ** Golf Course Sewage Treatment Facility Effluent BOD Limit: 10 mg/L.
8. Remote sites and training fields are not included.

INSTALLATION:	COMPLIANCE CATEGORY: WASTEWATER MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 13

WATER QUALITY MANAGEMENT

Korea ECAMP

SECTION 13

WATER QUALITY MANAGEMENT

A. Applicability of this Section

This section identifies regulations, responsibilities, and compliance requirements applicable to water use and management on Air Force (AF) installations, including activities and procedures involved in the collection, treatment, storage, and distribution of drinking water.

All AF installations have potable water issues of one sort or another; therefore, this section will be applicable to most installations.

The regulatory requirements in this section are based on DOD regulations and Air Force Regulations (AFRs) and Air Force Instructions (AFIs) that apply at overseas installations. Management Practices (MPs) are derived from U.S. Environmental Protection Agency (USEPA) regulations that are not mandatory overseas but are important to preserve the health and safety of AF employees and protect the environment.

B. DOD Directives/Instructions

- *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995, Chapter 3, addresses standards for potable water and the management of a drinking water facility.

C. U.S. Air Force Documents

- AFR 91-26, *Maintenance and Operation of Water Supply, Treatment, and Distribution Systems,* 30 August 1984, provides guidance for personnel who maintain and operate water supply, treatment, and distribution systems on AF installations.

- AFI 32-1066, *Plumbing Systems,* 4 May 1994, provides guidance for personnel who maintain and operate plumbing systems on AF installations.

- AFI 32-1067, *Water Systems,* 25 March 1994, provides guidelines for managing water and wastewater systems at U.S. AF bases.

- Headquarters (HQ) USAF/SG Policy Letter, *Water Testing in Child Development Centers (CDCs),* 21 October 1992, provides guidelines for monitoring drinking water at AF CDCs.

D. Responsibility for Compliance

- The Base Civil Engineer (BCE) designs, constructs, and operates the water supply system to provide sufficient drinking water to installation personnel. The BCE is responsible for providing adequate water treatment to assure that drinking water does not exceed the maximum contaminant levels established for human consumption. Training of operating personnel to meet proficiency levels consistent with the operator certification requirements that apply to their location is also the responsibility of the BCE. The BCE maintains an up-to-date map of the complete potable water system, makes

repairs, and maintains the systems. The BCE is also responsible for negotiating and maintaining the base's water supply contract.

- The Director of Base Medical Services, through BES, is responsible for proper sample collection from drinking water systems at AF installations and for determining compliance with drinking water standards.

E. Definitions

- *Action Level* - the concentration of a substance in the water that determines appropriate treatment for a water system (FGS-ROK, Chapter 3, Definitions).

- *Approved* - in the context of backflow prevention, 'approved' means that the International Association of Plumbing and Mechanical Officials (IAPMO) laboratory has tested the product and that it meets their standards. IAPMO-approved products carry an attached or imprinted IAMPO seal of approval. BCE can, with Major Command (MAJCOM) coordination, approve the installation of a new product or device not yet approved by IAPMO, but BCE must ensure that it will safely satisfy the intended purpose (AFI 32-1066, para 12.4).

- *Community Water System (CWS)* - a public water system having at least 15 service connections used by year-round residents or that regularly serves at least 25 of the same people for more than 6 mo per year (FGS-ROK, Chapter 3, Definitions).

- *Concentration/Time (CT)* - the product of residual disinfectant concentration (C) in mg/L determined before or at the first customer, and the corresponding disinfectant contact time (T) in minutes (FGS-ROK, 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-ROK, Chapter 3, Definitions).

- *First Draw Sample* - a 1 L [0.26 gal] sample of tapwater that has been standing in plumbing at least 6 h and is collected without flushing the tap (FGS-ROK, Chapter 3, Definitions).

- *Follow-Up Lead Monitoring* - two consecutive 6-mo monitoring periods for water systems that do not comply with the lead/copper rule. Monitoring consists of lead/copper tap samples and water quality parameters (WQPs). This sampling cycle continues until the system demonstrates compliance with the lead/copper rule (FGS-ROK, Chapter 3, Definitions).

- *Groundwater Under the Direct Influence of Surface Water (GWUDISW)* - any water below the surface of the ground with (FGS-ROK, 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.)

- *Initial Lead Monitoring for Medium/Small Systems* - two consecutive 6-mo monitoring periods for first-draw samples for lead and copper (FGS-ROK, Chapter 3, Definitions).

- *Lead-free* - a maximum lead content of 0.2 percent for solder and flux and 8.0 percent for pipes and fittings (FGS-ROK, 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 a line (FGS-ROK, Chapter 3, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *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 public water system, except for turbidity, for which the maximum permissible level is measured after filtration (FGS-ROK, Chapter 3, Definitions).

- *Nonpublic Water System (NPWS)* - a system that is not a public water system (e.g., a well serving a building) (FGS-ROK, Chapter 3, Definitions).

- *Nontransient, Noncommunity Water System (NTNCWS)* - a public water system that is not a community water system and that regularly serves at least 25 of the same persons for more than 6 mo per year (FGS-ROK, 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-ROK, 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-ROK, Chapter 3, Definitions).

- *Potable Water* - water that has been examined and treated to meet the standards of FGS-ROK, Chapter 3 (FGS-ROK, Chapter 3, Definitions).

- *Public Water System (PWS)* - a system for the provision to the public of piped water 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:
    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 public water system is either a community water system or a noncommunity water system. (FGS-ROK, Chapter 3, Definitions).

- *Reduced Lead Monitoring* - the scale-back of both the number of samples and the frequency of monitoring for those water systems that have demonstrated consistent compliance with the lead/copper rule. The regulatory authority is responsible for determining if a water system qualifies for reduced monitoring. Monitoring consists of lead/copper tap samples and WQPs and will be conducted annu-

ally for three consecutive years during the months of June, July, August, and September (FGS-ROK, Chapter 3, Definitions).

- *Sanitary Survey* - an onsite review of the water source, facilities, equipment, operation, and maintenance of a public water system to evaluate the adequacy of such elements for producing and distributing potable water (FGS-ROK, Chapter 3, Definitions).

- *Total Trihalomethanes (TTHMs)* - the sum of the concentration in mg/L of chloroform, bromoform, dibromochloromethane, and bromodichloromethane (FGS-ROK, Chapter 3, Definitions).

- *Transient Noncommunity Water System* (TNCWS) - a noncommunity water system that does not regularly serve at least 25 of the same persons over 6 months per year (FGS-ROK, Chapter 3, Definitions).

- *Ultimate Reduced Lead Monitoring* - monitoring that consists of lead/copper tap samples and WQPs. Monitoring is conducted once every 3 yr during the months of June, July, August, and September (FGS-ROK, 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-ROK, Chapter 3, Definitions).

- *Vulnerability Assessment* - an evaluation by USFK that shows that contaminants of concern either have not been used in a watershed area or the source of water for the system is not susceptible to contamination (FGS-ROK, 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-ROK, Chapter 3, Definitions).

WATER QUALITY MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	KO.13-1 through KO.13-5	(1)(2)(6)
Backflow Prevention	KO.13-6 through KO.13-18	(1)(2)(5)
Drinking Water		
General	KO.13-19 through KO.13-29	(1)(2)(4)
Water Quality Standards	KO.13-30 through KO.13-40	(2)(4)
Disinfection and Filtration	KO.13-41 and KO.13-42	(1)(2)(3)
Child Development Centers	KO.13-43 through KO.13-47	(2)
Recordkeeping and Notification Requirements	KO.13-48 through KO.13-57	(1)(2)(4)
Alternative Water Supplies	KO.13-58	(1)(2)
Underground Injection Control	KO.13-59	(2)(3)
Aquifers	KO.13-60	(2)(3)
Training and Certification	KO.13-61 through KO.13-63	(4)

(a) CONTACT/LOCATION CODE:

(1) BCE (Environmental Planning)
(2) BES (Bioenvironmental Engineering Services)
(3) BCE (Natural Resources Planner)
(4) Water Treatment Plant Superintendent
(5) Backflow Program Manager
(6) Base Staff Judge Advocate

WATER QUALITY MANAGEMENT

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

Physical Features To Inspect

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

People To Interview

- BCE (Environmental Planning)
- BES (Bioenvironmental Engineering Services)
- BCE (Natural Resources Planner)
- Water Treatment Plant Superintendent
- Base Staff Judge Advocate

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
ALL INSTALLATIONS	
KO.13-1. Determine actions or changes since previous review (MP).	Determine whether noncompliance issues have been resolved by reviewing a copy of the previous review report. (1)(2)
KO.13-2. Copies of all relevant DOD directives/ instructions, USAF directives, and guidance documents should be maintained at the installation (MP).	Verify that copies of the following regulations are maintained and kept current at the installation: (1)(6) - *Environmental Final Governing Standards--Republic of Korea* (FGS-ROK), April 1995 - AFR 91-26, *Maintenance and Operation of Water Supply, Treatment, and Distribution Systems*, 30 August 1984 - AFI 32-1066, *Plumbing Systems,* 4 May 1994 - AFI 32-1067, *Water Systems*, 25 March 1994 - HQ USAF/SG Policy Letter, *Water Testing in Child Development Centers*, 21 October 1992. Verify that the Base Staff Judge Advocate reviews the documents annually for currency and completeness and submits the findings of the review to the Base Environmental Protection Committee.
KO.13-3. Installations must meet regulatory requirements issued since the finalization of the manual (a finding under this checklist item will have the citation of the new regulation as a basis of finding).	Determine whether any new regulations concerning water quality have been issued since the finalization of the manual. (1)(6) Verify that the installation is in compliance with newly issued regulations.
KO.13-4. Outside of the continental U.S. (OCONUS) installations must cooperate with foreign regulatory agencies (AFI 32-1067, para 14.1).	Verify that the installation cooperates with foreign regulatory agencies, consistent with host nation agreements. (1)(2)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Natural Resources Planner) (4) Water Treatment Plant Superintendent (5) Backflow Program Manager (6) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-5. Bases must not have dual water supply systems for potable and nonpotable water unless certain conditions have been met (AFI 32-1067, para 12.1).	Verify that the following conditions are met by bases with dual water supply systems: (1) - BCE establishes and maintains a clearly defined separation of the two systems so that nonpotable water cannot contaminate the potable water system - the systems have approved backflow prevention devices to prevent contamination of potable water - the MAJCOM approves the dual system before construction and operation - connections between systems are avoided.
BACKFLOW PREVENTION	(NOTE: Except for laboratory sinks and sinks with hose threaded faucets, backflow preventers integral to a standard plumbing fixture do not come under this program.)
KO.13-6. Installations must have a Backflow Program Manager who fulfills specific responsibilities (AFI 32-1066, paras 6, 8, and 12.2).	Verify that an engineer or appropriate supervisor has been appointed the Backflow Program Manager. (1)(5) Verify that the Backflow Program Manager: - maintains an aggressive program to identify, isolate, record, and correct cross-connections and other potential sources of distribution system contamination - makes sure plumbing personnel can properly test, install, maintain, and repair backflow prevention device - identifies and forecasts training requirements for BCE personnel - reviews all plans and drawings of new or modified water systems to identify potential cross-connections - centrally maintains inspection records and the status of installation and upgrade actions.
KO.13-7. The installation's Backflow Program Manager must conduct a facility survey of plumbing devices and systems every 5 yr (AFI 32-1066, paras 8, 12.1).	Verify that the Backflow Program Manager conducts a facility survey of plumbing devices and systems every 5 yr. (5) Verify that records are updated to reflect the results of the survey. (NOTE: Military family housing is excluded from the survey unless underground sprinkler systems are installed.) (NOTE: The Backflow Program Manager coordinates the surveys with BES.) Verify that survey personnel locate backflow prevention devices, assess their adequacy, and determine the need for more devices. (NOTE: This information is used to determine potential or existing cross-connections and the degree of hazard they present.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Natural Resources Planner) (4) Water Treatment Plant Superintendent (5) Backflow Program Manager (6) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-7. (continued)	Verify that the results of the survey are recorded on AF Form 848, *Inventory of Cross-Connection Control and Backflow Prevention Devices.*
KO.13-8. BES must fulfill particular responsibilities with regard to cross-connections (AFI 32-1066, para 9).	Verify that BES assigns a degree of hazard to each cross-connection, using the *Uniform Plumbing Code* (UPC). (2) Verify that BES reviews plans for water system modification to prevent cross-connections and to identify existing cross-connections or other potential sources of contamination or pollution and recommends corrective action.
KO.13-9. BCE personnel must eliminate the potential for cross-connections (AFI 32-1066, para 11).	Verify that the potential for cross-connection is eliminated. (1) Verify that, if elimination is not feasible, approved prevention devices are installed. Verify that the devices installed prevent contamination of potable water supplies that are susceptible to backpressure or back-siphonage from fixtures, equipment, appliances, or buildings. Verify that, if the potable water supply is critical, approved backflow preventers are installed in parallel to allow maintenance or repair without system shutdown.
KO.13-10. Severe cross-connections must be eliminated immediately (AFI 32-1066, para 12.2).	Verify that severe cross-connections are eliminated immediately. (1)
KO.13-11. Installations must take specific actions with regard to existing backflow protection devices (AFI 32-1066, para 12.5).	Verify that existing backflow prevention devices are identified during the survey by a control number. (5) Verify that unapproved devices are replaced in priority depending on the degree of hazard and without waiting for the devices to fail. (NOTE: MAJCOM/CE may be contacted for help when uncertain about a device's category or level of protection.)

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-12. Installations must meet specific requirements with regard to backflow prevention on new dry/wet fire suppression systems (AFI 32-1066, para 12.6).	Verify that double check valve backflow preventers are installed on new dry/wet fire suppression systems that use only water as a fire suppressant. (5) Verify that a reduced pressure type backflow device is used where antifreeze or other hazardous chemicals are added. Verify that backflow preventers are approved and listed for fire protection use by acceptable testing agencies such as Underwriters' Laboratories or Factory Mutual.
KO.13-13. Backflow prevention retrofit work must be performed when systems are down for major renovation (AFI 32-1066, para 12.6).	Verify that backflow prevention retrofit work is performed when systems are down for major renovation. (5) (NOTE: This requirement is waived if a threat dictates that the work be performed sooner.)
KO.13-14. Technicians who test and maintain backflow prevention devices must be certified by MAJCOM (AFI 32-1066, paras 14 and 15).	Verify that MAJCOM-certified technicians perform tests, inspections, and maintenance of backflow prevention devices. (5) (NOTE: Current certificates using forms other than AF Form 483, *Certificate of Competency,* are valid until they expire.) Verify that technicians are recertified by MAJCOM every 3 yr. (NOTE: The MAJCOM recertifies technicians using data furnished by BCE, who requests recertification at least 60 days before the expiration date on AF Form 483. For the purposes of recertification a retraining course is unnecessary if the technician has inspected and tested a representative number (normally 50) of double-check and/or reduced pressure backflow devices since last certified.)
KO.13-15. Tests and inspections of backflow devices must be conducted on a schedule established by the Backflow Prevention Manager (AFI 32-1066, para 13).	Verify that the Backflow Prevention Manager has established a schedule for testing and inspecting all backflow devices, including air gaps. (5) Verify that the frequency of testing, inspection, and overhaul of each devices is established with due regard to the age, condition, and degree of hazard each prevents. (NOTE: The inspecting and testing schedule should be part of the recurring work program.) Verify that overhauls are performed according to manufacturer recommendations.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-15. (continued)	(NOTE: The following are recommended time intervals for inspection of backflow prevention devices. If the Degree of Hazard is: — Inspect Device Every: Minor — 24 mo Moderate — 24 mo Severe — 6 mo (Air Gap) — 12 mo.)
KO.13-16. Certain tasks must be conducted in the course of inspections of cross-connections (AFI 32-1066, paras 13.1, 13.2, and 13.3).	Verify that certified backflow inspectors inspect all cross-connections to make sure that: (5) - there is an approved air gap - the backflow prevention devices are in good condition - newly installed devices were installed correctly and are free of debris that could interfere with their functioning. Verify that all devices are tested in accordance with the UPC, the *UPC Illustrated Testing Manual*, or the manufacturer's instructions. Verify that defective devices are repaired and retested or replaced. Verify that the inspector records data on all cross-connections on AF Form 845, *Cross-Connection Information*, or an approved computerized version. (NOTE: For an air gap, the test consists of a visual inspection and an "OK" recorded if it is satisfactory.) Verify that the form appropriate for the device is also filled out: - AF Form 843, *Backflow Prevention Inspection Data* - AF Form 844, *Backflow Prevention (Vacuum Breakers) Inspection Data.*
KO.13-17. Installations must meet specific inspection requirements on newly installed back-flow prevention devices (AFI 32-1066, para 13.1).	Verify that newly installed devices are inspected within 1 week of installation. (5) Verify that a follow-up inspection is performed 3 mo later.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-18. Installations must meet recordkeeping requirements with regard to backflow prevention (AFI 32-1066, para 13.4).	Verify that the installation keeps an inventory of all device locations and an individual record (AF Form 845) for each device. (5) Verify that records of cross-connection control and backflow prevention devices are kept at a central location. Verify that the Backflow Program Manager keeps the records current and complete.
DRINKING WATER **General**	
KO.13-19. Installations must use municipal or regional water supply systems where feasible (AFI 32-1067, para 2).	Verify that the installation uses a municipal or regional water system where feasible. (1) Verify that a life cycle cost analysis is performed to determine the most cost-effective approach.
KO.13-20. 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-ROK, Chapter 3, Criterion 3a(10) and AFI 32-1067, para 13).	Verify that the installation has an emergency contingency plan that includes, at a minimum: (1)(2) - 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. Verify that the plan is updated as necessary.
KO.13-21. BCE must develop local operating instructions that address specific topics (AFI 32-1067, para 4.3).	Verify that BCE has developed local operating instructions that include the following: (1) - operational monitoring for process control - sampling and testing procedures - emergency operations - maintenance - regulatory compliance requirements.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-22. Installations must maintain a current map/drawing of the complete potable water system (FGS-ROK, Chapter 3, Criterion 3a(1)).	Verify that the installation maintains a current map/drawing of the complete potable water system. (1)
KO.13-23. Installations must have a Potable Water System Master Plan that is updated at least every 5 yr (FGS-ROK, Chapter 3, Criterion 3a(2)).	Verify that the installation has a Potable Water System Master Plan. (1) Verify that the plan is updated at least every 5 yr.
KO.13-24. Each separate water supply source must have a water meter and a raw water sampling point (AFI 32-1067, para 6).	Verify that each separate water supply source has a water meter and a raw water sampling point for water quality monitoring. (1)(4)
KO.13-25. Each active well should have an air line or electric depth gauge to measure drawdown, static level, and pumping level (MP).	Verify that each active well has an air line or electric depth gauge to measure drawdown, static level, and pumping level. (1)(4) (NOTE: This MP is drawn from AFI 32-1067, para 6.)

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-26. USFK water systems must meet specific requirements concerning positive pressure and maintenance practices (FGS-ROK, Chapter 3, Criteria 3a(6) through 3a(8)).	Verify that a continuous positive pressure is maintained in the water distribution system. (2)(4) Verify that there is an effective cross connection control and backflow prevention program. Verify that the water distribution operation and maintenance practices include: - 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).
KO.13-27. Installations must conduct sanitary surveys of the water system (FGS-ROK, Chapter 3, Criterion 3a(4)).	Verify that surveys of the water system, including a review of required water quality analyses, are conducted annually and as warranted. (1)(2) Verify that off-installation surveys are coordinated with the appropriate ROK authorities.
KO.13-28. Installations must conduct vulnerability assessments (FGS-ROK, Chapter 3, Criterion 3a(14)).	Verify that the installation has conducted a vulnerability assessment. (1)(2)
KO.13-29. Installations must use only lead-free pipe, solder, flux, and fittings when installing or repairing water systems and plumbing systems for drinking water (FGS-ROK, Chapter 3, Criterion 3a(11) and AFI 32-1067, para 12.4).	Verify that only lead-free materials (see definition) are used. (2)

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Water Quality Standards	(NOTE: These requirements apply regardless of whether the installation produces or purchases water.) (NOTE: Monitoring of secondary drinking water contaminants listed in Table 13-1 is not required, but the results of routine testing can be useful to plant operation.) (NOTE: Waivers for the monitoring requirements in this section may be granted only by the USFK Assistant Chief of Staff Engineer in coordination with the USFK Surgeon.) (NOTE: Exemptions from MCLs may be granted by the USFK Surgeon if the exemption will not result in an unreasonable risk to health.)
KO.13-30. Independent testing conducted in accordance with USEPA test methods and protocols must be used to demonstrate compliance with water quality standards (FGS-ROK, Chapter 3, Criterion 3b).	Verify that the installation uses independent testing conducted in accordance with USEPA test methods and protocols to demonstrate compliance with water quality standards. (2)(4)
KO.13-31. USFK water systems must meet specific MCL and testing requirements for total coliform bacteria (FGS-ROK, Chapter 3, Criterion 3b(1)).	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. (2)(4) 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. (NOTE: Any fecal coliform-positive repeat sample or *Escherichia coli* (*E. coli*)-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or *E. coli*-positive routine sample constitutes a violation of the MCL for total coliforms. For the purposes of public notification requirements, this is a violation that may pose an acute risk to health.) Verify that each system has a written, site-specific monitoring plan and collects routine samples according to the schedule in 13-2. Verify that systems with initial samples testing positive for total coliforms collect repeat samples as soon as possible, preferably on the same day. Verify that repeat samples are taken at the same tap as the original sample and that an upstream and a downstream sample are both collected within five service connections of the original service connection.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-31. (continued)	Verify that any additional required repeat sampling is performed according to local medical or Executive Agent guidance. Verify that monitoring continues until total coliforms are no longer detected. Verify that when routine or repeat samples are positive for total coliforms, they are tested for fecal coliforms or *E. coli.* Verify that, if the installation collects more than one routine sample/month, it collects no fewer than three repeat samples for each total coliform-positive sample found. Verify that, if the system has exceeded the MCL, installation personnel (U.S. and ROK) are notified no later than the end of the next business day that an acute risk to public health may exist. Verify that special purpose samples, are not used to determine compliance with the MCL for total coliforms. (NOTE: Samples such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, are examples of special purpose samples. Repeat samples are not considered special purpose samples and must be used to determine compliance with the MCL for total coliforms.)
KO.13-32. USFK water systems must meet specific requirements with regard to inorganic chemical parameters and monitoring (FGS-ROK, Chapter 3, Criterion 3b(2)).	Verify that the parameters in water distributed to end users do not exceed the limitations in Table 13-3. (2)(4) Verify that systems are monitored for inorganic chemicals at the frequency set in Table 13-4. Verify that, if a system is out of compliance, the Executive Agent and installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after the condition. (NOTE: If the installation is only monitoring annually on the basis of a waiver, it must immediately increase monitoring in accordance with Table 13-4 until authorities determine that the system is reliable and consistent and remedial actions are completed.)
KO.13-33. Installations that fluoridate their water must meet specific requirements (FGS-ROK, Chapter 3, Criterion 3b(3)).	(NOTE: Fluoridation of drinking water occurs at the discretion of the Installation Commander (IC) responsible for the PWS.) Verify that the fluoride content of drinking water does not exceed the MCL of 4.0 mg/L given in Table 13-3. (2)(4) 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.

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REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-33. (continued)	(NOTE: Daily monitoring is recommended for systems practicing fluoridation using the criteria in Table 13-5.) Verify that, if any sample exceeds the MCL, installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after the violation.
KO.13-34. USFK water systems must meet specific standards for lead and copper action levels and reporting requirements when these levels are exceeded (FGS-ROK, Chapter 3, Criterion 3b(4)).	Verify that the concentration of lead does not exceed 0.015 mg/L. (2)(4) Verify that the concentration of copper does not exceed 1.3 mg/L. (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.) Verify that monitoring is carried out in accordance with Table 13-6. Verify that sampling sites selected are as outlined in Table 13-6. Verify that high risk sampling sites are targeted by conducting a materials evaluation of the distribution system. Verify that, if an action level is exceeded, additional water samples are collected as specified in Table 13-6. Verify that optimal corrosion control treatment is pursued. 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. Verify that installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after receipt of test results when an action level is exceeded. Verify that an education program for installation personnel (U.S. and ROK) is implemented within 60 days.
KO.13-35. Installations must notify their users about lead in drinking water systems (FGS-ROK, Chapter 3, Criterion 3a(11)).	Verify that the installation provides public notification concerning the following: (2) - the lead content of materials used in distribution or plumbing systems - the corrosivity of water that has caused leaching - remedial actions that may be taken. (NOTE: This requirement appears to apply regardless of whether or not the action level for lead has been exceeded.)

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-36. USFK water systems must meet specific requirements with regard to synthetic organics (FGS-ROK, Chapter 3, Criterion 3b(5)).	Verify that synthetic organic chemicals in water distributed to people do not exceed the limitations outlined in Table 13-7. (2)(4) Verify that systems are monitored for synthetic organics according to the schedule in Table 13-8. Verify that, if the system is out of compliance, installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 14 days after the violation. (NOTE: When the MCLs for synthetic organic chemicals are exceeded, the installation must begin immediate quarterly monitoring and must increase quarterly monitoring if the level of any contaminant is at its detection limit but less than its MCL (see Table 13-8) and must continue until the system is reliable and consistent, and any necessary remedial measures are implemented.)
KO.13-37. USFK water systems must meet specific requirements with regard to TTHMs (FGS-ROK, Chapter 3, Criterion 3b(6)).	Verify that PWSs and NTNCWSs that add a disinfectant (oxidant, such as chlorine, chlorine dioxide, or chloramines) to any part of the treatment process do not exceed an MCL of 0.10 mg/L for TTHMs in drinking water. (2) Verify that systems that add a disinfectant monitor for TTHMs as outlined in Table 13-9. Verify that, if the system is out of compliance, installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 14 days after the violation, and that remedial measures are undertaken.
KO.13-38. USFK water systems must meet specific requirements with regard to radionuclides (FGS-ROK, Chapter 3, Criterion 3b(7)).	Verify that PWSs and NTNCWSs meet the MCLs for radionuclides and that monitoring is performed as outlined in Table 13-10. (2)(4) Verify that, if the average annual MCL for gross alpha activity, total radium, or gross beta is exceeded, the appropriate ROK authorities and installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 30 days after receipt of the test results. (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.) Verify that, if any gross beta MCL is exceeded, the major radioactive components are identified.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-39. Installations must test USFK PWS filtered waters daily for turbidity and must meet a specific MCL for turbidity (FGS-ROK, Chapter 3, Criterion 3b(9)).	Verify that the installation tests PWS filtered water for turbidity daily. (2)(4) Verify that the monthly average of daily samples does not exceed 1 Nephelometric Turbidity Unit (NTU) in more than 5 percent of the samples. Verify that the average of 2 consecutive days does not exceed 5 NTU. Verify that, if the MCL for turbidity is exceeded, installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 14 days after the violation.
KO.13-40. Installations must periodically monitor USFK NPWSs for total coliforms and disinfectant residuals (FGS-ROK, Chapter 3, Criterion 3b(11)).	Determine whether the installation operates an NPWS. (2)(4) Verify that the installation periodically monitors (as a minimum) for total coliforms and disinfectant residuals.
Disinfection and Filtration	
KO.13-41. Installations that use surface water or GWUDISW to produce potable water must conform to certain treatment requirements (FGS-ROK, Chapter 3, Criteria 3a(5) and 3b(8)).	Determine whether the installation employs surface water sources or GWUDISW. (1)(2)(3) Verify that the installation meets the surface water treatment requirements specified in Table 13-11.
KO.13-42. Installations that use a groundwater source as their supply of drinking water must disinfect the supplies (FGS-ROK, Chapter 3, Criterion 3a(5)).	Determine whether the installation's water supply is groundwater. (1)(2)(3) Verify that, at a minimum, groundwater supplies are disinfected.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Child Development Centers	
KO.13-43. Drinking water at CDCs must be sampled monthly (HQ USAF/SG Policy Letter, 21 October 1992, paras 1 and 4).	Verify that the drinking water at CDCs is sampled monthly. (2) Verify that bacteriological sampling is accomplished monthly. (NOTE: Chemical sampling is generally accomplished once every 3 yr.)
KO.13-44. BES and CDC Directors must coordinate certain efforts (HQ USAF/SG Policy Letter, 21 October 1992, para 2).	Verify that BES and the CDC Director coordinate the following: (2) - determine whether *Lead Contamination Control Act* (LCCA) sampling was thorough and complete - review records to ensure that identified corrective actions to remove sources of lead contamination were completed - ensure that Lead Assessment Program analytical results for drinking water lead concentrations are on file in the CDC administrative office.
KO.13-45. The Director of the CDC must notify BES of certain activities (HQ USAF/SG Policy Letter, 21 October 1992, para 3).	Verify that BES is notified prior to the opening of a new CDC facility and when plumbing lines or fixtures are added or replaced. (2)
KO.13-46. Certain taps must be taken out of service and resampled (HQ USAF/SG Policy Letter, 21 October 1992, para 3).	Verify that taps with lead concentrations exceeding 20 parts per billion (ppb) are taken out of service and resampled. (2) Verify that remediation is accomplished when successive sample results exceed 20 ppb.
KO.13-47. BES must perform sampling in accordance with LCCA guidance under certain circumstances (HQ USAF/SG Policy Letter, 21 October 1992, para 3).	Verify that BES performs sampling in accordance with LCCA guidance when metallic materials are used in CDC plumbing systems. (2)

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Recordkeeping and Notification Requirements	
KO.13-48. Water treatment logs must be prepared (AFI 32-1067, para 10.1.1).	Verify that operators prepare AF Form 1461, *Water Utility Operating Log (General).* (4) Verify that, if the water requires more than minor treatment, AF Form 1460, *Water Utility Operating Log (Supplemental)*, is prepared.
KO.13-49. Water treatment facilities must manage logs and reports in accordance with specific requirements (AFI 32-1067, paras 10.1).	Verify that daily operating logs and laboratory records are prepared for in-plant use. (4) (NOTE: Computer files and printouts such as the Work Information Management System (WIMS) operating logs are acceptable if they have the same information as the forms.) Verify that permanent records of the printouts are kept as if they were forms. Verify that backup copies of the active computer files are maintained to protect them against accidental loss. Verify that operating logs or computer files are posted daily (covering one month's operation) in neat legible form. Verify that the original form or computer printout is kept for the BCE permanent file.
KO.13-50. Specific records must be maintained for wells and pumping stations (AFI 32-1067, para 10.1.2 and 10.2).	Verify that AF Form 996, *Well Data*, is completed and a file kept for each well, beginning with initial construction. (4) Verify that the information is updated after completing a repair, redeveloping a well, or conducting a performance test. Verify that the following daily operating records are maintained for wells and pumping stations: - AF Form 997, *Daily Well Activity Record* - AF Form 998, *Daily Pumping Station Activity Record - Water.*

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-51. Facilities should establish local procedures for preparing coordinating, reviewing, and approving logs and reports (MP).	Verify that water treatment and wastewater treatment facilities establish local procedures for preparing coordinating, reviewing, and approving logs and reports. (4) (NOTE: This MP is found in AFI 32-1067, para 10.1.3.)
KO.13-52. Specific records must be maintained for USFK water systems (FGS-ROK, Chapter 3, Criterion 3a(12)).	Verify that records of chemical analyses are kept for at least 10 yr. (2) Verify that records showing monthly operating reports are maintained for at least 3 yr. Verify that records of bacteriological results are maintained for at least 5 yr.
KO.13-53. Specific physical facility information must be developed, maintained, and kept available at treatment facilities (AFI 32-1067, para 10.2).	Verify that the following information is developed, maintained, and kept available at the treatment facilities: (1)(4) - required plant-specific Operations and Maintenance (O&M) manuals and applicable AF publications - system operating instructions with single-line drawings, including operational and compliance monitoring procedures - up-to-date system as-built drawings along with other system plans and blueprints, including hydraulic water elevation profiles and a drawing of the entire collection and distribution systems - AF Form 996, *Well Data* - shop drawings, catalogue cuts, and any other equipment information or literature.
KO.13-54. Installations must develop and maintain effective maintenance plans that address specific topics (AFI 32-1067, para 10.3).	Verify that the installation develops and maintains effective maintenance plans that include: (1) - a recurring work schedule - a maintenance history for each major piece of equipment - an essential spare parts list, with spare parts stocked at the treatment facility or other accessible location - a long-range maintenance and improvement plan.

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-55. Installations must document actions taken to correct breaches of water quality criteria (FGS-ROK, Chapter 3, Criterion 3a(13)).	Verify that the installation documents corrective actions taken to correct breaches of criteria. (2) Verify that such documentation is maintained for at least 3 yr.
KO.13-56. Required notifications must meet specific content standards (FGS-ROK, Chapter 3, Criterion 3c).	Verify that the IC notifies both U.S. and ROK installation personnel when a USFK water system is out of compliance with primary maximum contaminant levels. (1)(2)(4) Verify that the public notices are clear and understandable and address the following topics: - 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. Verify that, in cases of continued noncompliance, the IC accomplishes public notification requirements at least every 3 mo.
KO.13-57. Installations must notify the MAJCOM Civil Engineer when the potable water supply becomes contaminated (AFI 32-1066, para 6).	Verify that MAJCOM/CE is notified when the potable water supply becomes contaminated. (1)

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
Alternative Water Supplies	
KO.13-58. USFK installations must use only approved alternative water sources, if the use of alternative sources is necessary (FGS-ROK, Chapter 3, Criterion 3b(12)).	Determine whether the installation uses alternative water sources. (1)(2) Verify that alternative water sources have approval from the IC. (NOTE: This requirement includes POE and POU treatment devices, as well as bottled water supplies.)
Underground Injection Control	
KO.13-59. Underground injection must be carried out in such a way that underground water resources are protected (FGS-ROK, Chapter 3, Criterion 3a(9)).	Verify that the installation regulates underground injection so as to protect underground water sources. (2)(3) Verify that, at a minimum, the installation conducts monitoring to determine the effects of any underground injection wells on nearby groundwater supplies.
Aquifers	
KO.13-60. Installations must protect water supply aquifers from contamination (FGS-ROK, Chapter 3, Criterion 3a(3)).	Determine whether the installation is located near a water supply aquifer. (2)(3) Verify that the aquifer is protected by suitable placement and construction of wells, siting and maintenance of septic systems and onsite treatment units, and appropriate land use management.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Natural Resources Planner) (4) Water Treatment Plant Superintendent (5) Backflow Program Manager (6) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
TRAINING AND CERTIFICATION	
KO.13-61. Personnel engaged or employed in the operation and maintenance of water treatment facilities must meet certification or training requirements as developed by the USFK Assistant Chief of Staff Engineer (FGS-ROK, Chapter 3, Criterion 3d).	Verify that personnel engaged or employed in the operation and maintenance of water treatment facilities meet certification or training requirements as developed by the USFK Assistant Chief of Staff Engineer. (3)(4)
KO.13-62. Operators of water treatment plants must meet training requirements (AFI 32-1067, para 8.1).	Verify that new operators receive classroom training and extensive supervised on-the-job training before being assigned to critical tasks. (3)(4) Verify that experienced personnel receive technical refresher courses and upgrade training. (NOTE: Training requirements may be met by one of the following means: - AF training available through technical schools, career development correspondence courses, and on-the-job training - civilian training courses available at educational institutions, government agencies, and professional and technical associations - correspondence courses from accredited institutions for operators in areas that do not have local resident courses.)
KO.13-63. Supervisors at water treatment plants must meet specific requirements with regard to safety training for all employees (AFI 32-1067, para 9).	Verify that all employees are familiar with the safety instructions in the following documents, as applicable: (3)(4) - AFR 91-26, *Maintenance and Operation of Water Supply, Treatment, and Distribution Systems* - AFM 91-32, *Operation and Maintenance of Domestic and Industrial Wastewater Systems* - Air Force Occupational Safety and Health Standard (AFOSH STD) 127-10, *Civil Engineering* - AFOSH STD 127-25, *Confined Spaces* - AFOSH STD 161-21, *AF Hazard Communication Standard.* Verify that the supervisor maintains current BES baseline and annual industrial hygiene survey reports.

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Natural Resources Planner) (4) Water Treatment Plant Superintendent (5) Backflow Program Manager (6) Base Staff Judge Advocate

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Republic of Korea ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
KO.13-63. (continued)	(NOTE: The supervisor should use these reports to train workers on occupational health hazards.) Verify that supervisors make safety instructions readily available to all operating personnel. Verify that supervisors train facility personnel on safety procedures and equipment and enforce their proper use at all times. (NOTE: Once trained, individual workers are personally responsible for following safe procedures.)

(1) BCE (Environmental Planning) (2) BES (Bioenvironmental Engineering Services) (3) BCE (Natural Resources Planner) (4) Water Treatment Plant Superintendent (5) Backflow Program Manager (6) Base Staff Judge Advocate

Table 13-1

Secondary MCLs

(FGS-ROK Table 3-12)

Contaminant	Secondary MCL
Aluminum	0.05 - 0.2 mg/L
Chloride	250 mg/L
Color	15 color units
Corrosivity	Noncorrosive
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5 to 8.5
Silver	0.1 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

Table 13-2

Total Coliform Monitoring Frequency

(FGS-ROK Table 3-2)

Population Served per Month	Minimum Number of Samples per Month
25 to 1000[1]	1
1001 to 2500	2
2501 to 3300	3
3301 to 4100	4
4101 to 4900[2]	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

[1] A noncommunity water system using groundwater and serving 1000 or fewer people may monitor once in each calendar quarter during which the system provides water, provided that a sanitary survey conducted within the last 5 yr shows the system is supplied solely by a protected groundwater source and free of sanitary defects.

Systems serving fewer than 4900 people which 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.

Table 13-3

Inorganic Chemical MCLs

(FGS-ROK Table 3-3)

Contaminant	MCL, mg/L
Arsenic	0.05
Asbestos[1]	7 million fibers/L (longer than 10 μm)
Barium	1.0
Cadmium[1]	0.010
Chromium[1]	0.05
Fluoride[2]	1.5
Mercury[1]	0.002
Nitrate[3]	10.0 (as N)
Nitrite[3]	1.0 (as N)
Total Nitrite and Nitrate[3]	10.0 (as N)
Selenium[1]	0.01
Sodium[4]	
Antimony[1]	0.006
Beryllium[1]	0.004
Cyanide (as free Cyanide)[1]	0.2
Nickel[1]	0.1
Thallium[1]	0.002

[1] MCLs apply to CWSs and NTNCWSs.

[2] Fluoride also has a secondary MCL at 2.0 mg/L. The primary MCL applies only to CWSs. See checklist item KO.13-32 for additional fluoride requirements.

[3] MCLs apply to CWSs, NTNCWSs, and TNCWSs.

[4] No MCL established. Monitoring is required so concentration levels can be made available on request.

(NOTE: See checklist items KO.13-33 and KO.13-34 for additional criteria concerning lead and copper.)

Table 13-4

Inorganics Monitoring Requirements

(FGS-ROK Table 3-4)

Contaminant	Groundwater Baseline Requirement[1]	Surface Water Baseline Requirement	Trigger That Increases Monitoring[5]	Waivers
Barium	1 sample/3 yr	Annual sample	> MCL	---
Cadmium	1 sample/3 yr	Annual sample	> MCL	---
Chromium	1 sample/3 yr	Annual sample	> MCL	---
Mercury	1 sample/3 yr	Annual sample	> MCL	---
Selenium	1 sample/3 yr	Annual sample	> MCL	---
Sodium	1 sample/3 yr	Annual sample	---	---
Asbestos	1 sample/9 yr	1 sample/9 yr	> MCL	Yes[2]
Nitrate	Annual sample	Quarterly	> 50% MCL[6]	Yes[3]
Nitrite	Annual sample	Quarterly	> 50% MCL[6]	Yes[4]
Corrosivity[7]	Once	Once	---	---
Arsenic	1 sample/3 yr	Annual sample	> MCL	---
Fluoride	1 sample/3 yr	Annual sample	> MCL	---
Antimony	1 sample/3 yr	Annual sample	> MCL	---
Beryllium	1 sample/3 yr	Annual sample	> MCL	---
Cyanide	1 sample/3 yr	Annual sample	> MCL	---
Nickel	1 sample/3 yr	Annual sample	> MCL	---
Thallium	1 sample/3 yr	Annual sample	> MCL	---

[1] Samples must be taken as follows: groundwater systems must take a minimum of one sample at every entry point to the distribution system that is representative of each well after treatment and at a consumer's tap; surface water systems must take at least one sample at a consumer's tap and every entry point to the distribution system after any application of treatment or in the distribution system at a point that is representative of each source after the treatment.

[2] Necessity for analysis is predicated upon a vulnerability assessment conducted by the PWS.

[3] The DOD Executive Agent may reduce repeat sampling frequency of surface water systems to an annual sample if, after 1 yr, the parameter is less than 50 percent of the annual sample MCL.

[4] The DOD Executive Agent may reduce repeat sampling frequency to one sample if the parameter is 50 percent of MCL.

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

(continued)

[6] Increased quarterly monitoring must be undertaken for nitrate and nitrite if a sample is greater than 50 percent of the MCL.

[7] PWSs must be analyzed within 1 yr of the effective date of country-specific final governing standards to determine the corrosivity entering the distribution system.

Table 13-5

Recommended Fluoride Concentration at Different Temperatures

(FGS-ROK Table 3-5)

Annual Average of Max. Daily Air Temperatures (^{o}F)	Control Limits (mg/L)		
	Lower	Optimum	Upper
50.0 - 53.7	0.9	1.2	1.7
53.8 - 58.3	0.8	1.1	1.5
58.4 - 63.8	0.8	1.0	1.3
63.9 - 70.6	0.7	0.9	1.2
70.7 - 79.2	0.7	0.8	1.0
79.3 - 90.5	0.6	0.7	0.8

Table 13-6

Monitoring Requirements for Lead and Copper Water Quality Parameters

(FGS-ROK Table 3-6)

System Size / Population Served	Monitoring Type	Initial Monitoring[1,2] — 2 consecutive 6-mo sampling periods	Follow-up Monitoring[1,2] — 2 consecutive 6-mo sampling periods	Reduced Monitoring[3] — annually for 3 yr	Ultimate Reduced Monitoring — every 3 yr
10,000 to 50,000	Cold Water Tap (1st draw)	60	60	30	30
	POE[5]	None	1	1	1
	WQPSs[4]	None	10	7	7
3301 to 10,000	Cold Water Tap (1st draw)	40	40	20	20
	POE[5]	None	1	1	1
	WQPSs[4]	None	3	3	3
501 to 3300	Cold Water Tap (1st draw)	20	20	10	10
	POE[5]	None	1	1	1
	WQPSs[4]	None	3	3	3
101-500	Cold Water Tap (1st draw)	10	10	5	5
	POE[5]	None	1	1	1
	WQPSs[4]	None	1	1	1
less than 100	Cold Water Tap (1st draw)	5	5	5	5
	POE[5]	None	1	1	1
	WQPSs[4]	None	1	1	1

[1] Two consecutive 6-mo monitoring periods.

[2] Sampling sites must be based on a hierarchal approach. For CWSs, priority must 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 must 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 must be collected from a cold water kitchen or bathroom tap; nonresidential samples must be taken at an interior tap from which water is typically drawn for consumption.

(continued)

Table 13-6 (continued)

[3] Monitor annually for lead and copper if action levels are met during each of two consecutive 6-mo monitoring periods. Annual sampling must be conducted during the months of June, July, August, and September.

[4] Water quality parameter samples (WQPSs) must be representative of water quality throughout the distribution system and include a sample from the entry to the distribution system. Samples must 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.

[5] POE: Point of entry into the water distribution system.

Table 13-7

Synthetic Organic Chemical MCLs

(FGS-ROK Table 3-7)

Synthetic Organic Chemical	MCL, mg/L	Detection Limit, mg/L
Pesticides, PCBs		
Alachor	0.002	0.0002
Atrazine	0.003	0.0001
Carbofuran	0.04	0.0009
Chlordane	0.002	0.0002
2,4-D	0.07	0.0001
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00002
Endrin	0.002	0.00002
Ethylene dibromide (EDB)	0.00005	0.00001
Heptachlor	0.0004	0.00004
Heptachlorepoxide	0.0002	0.00002
Lindane	0.0002	0.00002
Methoxychlor	0.04	0.0001
PCBs (as decachlorobiphenyls)	0.0005	0.0001
Pentachlorophenol	0.001	0.00004
Toxaphene	0.003	0.001
2,4,5-TP (Silvex)	0.05	0.0002
Benzo [a] pyrene	0.0002	0.00002
Dalapon	0.2	0.001
Di (2-ethylhexyl) adipate	0.4	0.0006
Di (2-ethylhexyl) phthalate	0.006	0.0006
Dinoseb	0.007	0.0002
Diquat	0.02	0.0004
Endothall	0.1	0.009
Glyphosate	0.7	0.006
Hexachlorobenzene	0.001	0.0001
Hexachlorocyclopentadiene	0.05	0.0001
Oxamyl (Vydate)	0.2	0.002

(continued)

Table 13-7 (continued)

Synthetic Organic Chemical	MCL, mg/L	Detection Limit, mg/L
Picloram	0.5	0.0001
Simazine	0.004	0.00007
2,3,7,8-TCDD (Dioxin)	3×10^{-8}	5×10^{-9}
Volatile Organic Compounds (VOCs)		
Benzene	0.005	0.0005
Carbon tetrachloride	0.005	0.0005
o-Dichlorobenzene	0.6	0.0005
cis-1,2-Dichloroethylene	0.07	0.0005
trans-1,2-Dichloroethylene	0.1	0.0005
1,1-Dichloroethylene	0.007	0.0005
1,1,1-Trichloroethane	0.20	0.0005
1,2-Dichloroethane	0.005	0.0005
1,2-Dichloropropane	0.005	0.0005
Ethylbenzene	0.7	0.0005
Monochlorobenzene	0.1	0.0005
para-Dichlorobenzene	0.075	0.0005
Styrene	0.1	0.0005
Tetrachloroethylene	0.005	0.0005
Trichloroethylene	0.005	0.0005
Toluene	1.0	0.0005
Vinyl chloride	0.002	0.0005
Xylene (total)	10	0.0005
Dichloromethane	0.005	0.0005
1,2,4-Trichlorobenzene	0.07	0.0005
1,1,2-Trichloroethane	0.005	0.0005

Use current USEPA test methods.

Table 13-8

Synthetic Organic Chemical Monitoring Requirements

(FGS-ROK Table 3-8)

Contaminant	Base Requirement[1]		Trigger for more monitoring[6]	Waivers
	Groundwater	Surface water		
VOCs	Quarterly	Quarterly	> 0.0005 mg/L	Yes[2,3]
Pesticides/PCBs	Four quarterly samples/3 yr during most likely period for their presence		> Detection limit[5]	Yes[3,4]

[1] Groundwater systems must take a minimum of one sample at every entry point that is representative of each well after treatment; surface water systems must take at least 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 to the following after one round of no detection:
- systems greater than 3300 may be reduced to 2 samples/yr every 3 yr
- systems less than 3300 may be reduced to 1 sample every 3 yr.

[5] Detection limits noted in Table 13-7.

[6] 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 USFK Assistant Chief of Staff Engineer requests a confirmation sample. A system is out of compliance if any contaminant exceeds the MCL. If four consecutive quarters of sampling results are not available, subject to approval from Assistant Chief of Staff Engineer, USFK, the installation may substitute six quarters of sampling results collected during the past two years to determine compliance.)

Table 13-9

TTHM Monitoring Requirements

(FGS-ROK Table 3-9)

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 must 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 must be analyzed. If the TTHM sample exceeds the MCL, noncompliance results.

3. If four consecutive quarters of sampling results are not available, subject to approval from the Assistant Chief of Staff Engineer, USFK, the installation may substitute six quarters of sampling results collected during the past 2 yr to determine compliance.

Table 13-10

Radionuclide MCLs and Monitoring Requirements

(FGS-ROK Table 3-10)

MCL Contaminant	MCL, pCi/L
Gross Alpha[1]	15
Combined Radium-226 and -228	5
Gross Beta[2]	50
Strontium-90	8
Tritium	20,000

Monitoring Requirements

For gross alpha activity and radium-226 and radium-228, systems must be tested once every 4 yr. Testing will 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 less than or equal to 5 pCi/L. Where radium-228 may be present, radium-226 and/or radium-228 analyses should be performed when activity is greater than 2 pCi/L. If the average annual concentration is less than half the maximum contaminant level, 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.

[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., equal a dose of 4 mrem/yr, the individual components must be determined.

Table 13-11

Surface Water Treatment Requirements

(FGS-ROK Table 3-1)

1. **Unfiltered Systems**

   a. Systems that use unfiltered surface water or groundwater sources 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. If the total coliforms and/or fecal coliforms exceed 100/100 milliliters (mL) and 20/100 mL, respectively, appropriate filtration must be applied. Appropriate 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 in the distribution system are undetected in more than 5 percent of monthly samples for two 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.

INSTALLATION:	COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Korea ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		