INTEGRATED PEST MANAGEMENT PLAN

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI

OCTOBER 2015

PREPARED BY

NAVFAC
Naval Facilities Engineering Command
NAVFAC ATLANTIC

Cover page photos courtesy of www.navy.mil.

Top left: Seabees assigned to Naval Mobile Construction Battalion (NMCB) 74, from Gulfport, MS, assist members of Hike for KaTREEna, a non-profit organization restoring parks in New Orleans, LA, by planting trees and refurbishing both public and private facilities damaged by hurricane Katrina. U.S. Navy photo by Mass Communication Specialist 2nd Class Michael Lindsey, April 16, 2012.

Top right: Builders assigned to NMCB 11 participate in a masonry course at NCBC Gulfport. U.S. Navy photo by Mass Communication Specialist 1st Class Jonathan Carmichael, October 25, 2012.

Bottom left: Seabees assigned to NMCB 11 assemble a medium girder bridge to obtain the certification required for deployment. This training is a part of NMCB 11 homeport training period, which heightens knowledge base, essential mobility skills and command readiness. U.S. Navy photo by Construction Mechanic Constructionman Michael Schutt, June 11, 2014.

Bottom right: Seabees from NMCB 15 set security in a simulated build site during training to prepare for their final evaluation problem before deployment. U.S. Navy photo by Mass Communication Specialist 2nd Class Daniel Garas, January 26, 2013.

Naval Construction Battalion Center Gulfport
Integrated Pest Management Plan
Approval and Implementation

Prepared by:
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Technical and Administrative Approval:
Approved and signed in accordance with DODI 4150.07

_____ _____
Danny Nichols Date
Integrated Pest Management Coordinator

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Lisa Noble Date
Installation Environmental Program Manager

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Marion Fannaly Date
Natural Resources Manager

_____ _____
CDR Brian Nottingham Date
Public Works Officer

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HMC Raquel Guimary Date
Preventive Medicine Department
Branch Health Clinic

Approved for Implementation:

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CAPT Cheryl M. Hansen Date
Commanding Officer

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Naval Construction Battalion Center Gulfport
Integrated Pest Management Plan
Technical Review

The Integrated Pest Management Plan has been reviewed in accordance with DODI 4150.07.

Date: 10/16/15

Ms. Sabra Scheffel
Applied Biology Branch Head
Naval Facilities Engineering Command, Atlantic
Norfolk, VA

Date: 01 JUN 15

CDR Darryl Arfsten
MSC, USN
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Jacksonville, FL

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Integrated Pest Management Plan Annual Review

Year	Completion Date	Integrated Pest Management Coordinator	Copies of changes to the Pest Management Consultant (Annual) Date Completed
16			
17			
18			
19			
20	Rewrite		

Scheduled On-Site Pest Management Technical Review

Scheduled Date	Integrated Pest Management Coordinator	Pest Management Consultant Date Review Completed
21-23 October 2014	Danny Nichols	23 October 2014 (Chris Martin)

Note: Technical Reviews should be scheduled approximately 3 years apart and in conjunction with an EMS review if possible.

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List of Figures

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Additional Source Documents

Pest Management Program Review Reports (2005, 2008, 2014)

General Installation Maps

Red Imported Fire Ant Quarantine Map

Applicable DOD, Federal, and State Regulations (DODI 4150.07, OPNAVINST 6250.4C, OPNAV M 5090.1 Ch. 24, CNO Feral Cat Policy Letter)

Integrated Pest Management Plan Annual Update Form

State of Mississippi Pesticide General Permit for Point Source Discharges to State Waters of Mississippi from the Application of Pesticides

Naval Construction Battalion Center Gulfport Stennis Western Maneuver Area Integrated Natural Resources Management Plan 2011

Naval Construction Battalion Center Gulfport Spill Prevention, Control, and Countermeasure Plan 2011

Naval Branch Health Clinic Gulfport Preventive Medicine Protocol for Bed Bugs

Chikungunya Vector Surveillance & Control Plan for U.S. Navy and Marine Corps Installations 2014

West Nile Virus Vector Surveillance & Control Guide for U.S. Navy and Marine Corps Installations 2014

Manual of Naval Preventive Medicine (NAVMED P) 5010-1 (2004), Chapter 1, Food Safety

Manual of Naval Preventive Medicine (NAVMED P) 5010-8 (2004), Chapter 8, Navy Entomology and Pest Control Technology

NAVFAC Online Pesticide Reporting System Tutorial

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EXECUTIVE SUMMARY

This Integrated Pest Management Plan is a comprehensive, long-range document that captures all of the pest management operations and pesticide-related activities conducted on the installation. It incorporates pest management practices and the local, state, federal, and Department of Defense regulations, and conforms to the requirements of Department of Defense Instruction 4150.07, DOD Pest Management Program, and Chief of Naval Operations Instruction 6250.4C, Navy Pest Management Programs. It supplies comprehensive information about the pest management program to installation staff and internal and external compliance auditors.

The Naval Facilities Engineering Command, Atlantic's Applied Biology Center prepared this plan using information obtained through pest management data collection, on-site observations, installation personnel interviews, and document reviews.

The main goal of the various pest control functions is to support the mission of Naval Construction Battalion Center Gulfport. Pest control services for the installation are provided by a combination of in-house and contract pest control operators. Pest control services are needed on the installation in order to:

1. Provide services that will prolong the life of the structures through subterranean termite and nuisance pest control

2. Maintain the safety and security of industrial and storage areas through weed control

3. Provide nuisance pest control to all buildings (except public-private venture housing) and outdoor areas to ensure a good working and living environment

4. Control weed and insect pests in all recreational and lawn areas to maintain aesthetics and provide recreational facilities to personnel

5. Provide control of mosquitoes, flies, and other potential disease vectors to ensure the comfort and well-being of all personnel

6. Provide vertebrate pest control, including rodent control, to all areas of the installation.

For the current level of work to be accomplished, a sufficient staff of qualified applicators must be maintained. Contract personnel must meet state certification requirements as specified by the contract. Pest management performance assessment representatives must successfully take an initial pest management performance assessment representatives course. To maintain their certification, the pest management performance assessment representatives and Department of Defense pesticide applicators must successfully pass a Department of Defense pest management training and recertification course every three years. Pest control facilities must comply with current safety standards to provide a safe workplace and to minimize pesticide hazards.

This plan focuses on safe, environmentally-sound, and cost-effective control of pests through integrated pest management. Integrated pest management depends on education, proper surveillance, and identification of pests, non-chemical and chemical control methods, and individual responsibility for pest prevention.

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CHAPTER 1

Introduction

1.1 INTEGRATED PEST MANAGEMENT PLAN

The Integrated Pest Management Plan (IPMP) is a long-range, comprehensive planning and operational document that establishes the strategy and methods for conducting a safe, effective, and environmentally-sound Integrated Pest Management (IPM) program. The IPMP covers all pest management and pesticide-related activities conducted by civilian and military Department of Defense (DOD) personnel and commercial contractors within all functional areas of the installation.

1.1.1 Authority

Department of Defense Instruction (DODI) 4150.07, DOD Pest Management Program; Chief of Naval Operations Instruction (OPNAVINST) 6250.4C, Navy Pest Management Programs; and Chief of Naval Operations Manual (OPNAV M) 5090.1, Environmental Readiness Program Manual, Chapter 24—Pesticide Compliance Ashore, require that all Navy installations develop and implement an IPMP in accordance to the guidelines. The IPMP will detail all aspects of pesticide management including administration, procurement, contract services, storage, disposal, safety, reporting, vehicles, integrated pest management, and applicable laws and regulations.

1.1.2 Department of Defense Measures of Merit

This plan provides the framework for the installation to meet the DOD's annual goals or measures of merit (MoMs). As established in DODI 4150.07, and updated by the Armed Forces Pest Management Board, the MoMs are:

1. Measure of Merit 1: All DOD installations will maintain installation Pest Management Plans that have been reviewed and approved by a DOD-certified Pest Management Consultant and annually updated by the installation pest management coordinator.

   Naval Construction Battalion Center (NCBC) Gulfport helps meet this goal by implementing (via the commanding officer's signature) this plan.

2. Measure of Merit 2: All DOD installations will adhere to the principals of integrated pest management and the DOD will maintain the goal of minimizing annual pesticide use by both government and contractor pesticide applicators on its installations. This goal is set at 425,000 lbs of active ingredient, the DOD's average annual usage for Fiscal Years 2007–2009 and an overall 52 percent reduction from the original fiscal year 1993 baseline.

   NCBC Gulfport provides data for this MoM through the reporting requirement (section 2.3).

3. Measure of Merit 3: All DOD pesticide applicators will be certified. All contracted employees shall have appropriate U.S. state or host-nation pesticide applicator certification in the appropriate categories at the time the contract is let.

NCBC Gulfport ensures proper certification of all applicators through regular verifications and maintains a list of certifications in appendix D of this plan. See section 2.4 for training and certification requirements.

1.1.3 Integrated Pest Management Plan Implementation

The IPMP must be reviewed and approved by installation stakeholders and professional pest management consultants (PPMCs) from Naval Facilities Engineering Command (NAVFAC), Atlantic and the Bureau of Medicine and Surgery (BUMED). The IPMP is implemented upon signature of the installation's commanding officer. The integrated pest management coordinator (IPMC) has the task of implementing, coordinating, and executing the IPMP among each of the functional areas of the installation.

1.1.4 Integrated Pest Management Plan Maintenance

Once the IPMP has been developed and implemented, it must be reviewed annually and updated as necessary. The installation IPMC is responsible for maintaining the IPMP.

1.1.4.1 Internal Review

The IPMC shall conduct an internal review annually in coordination with the pest management service providers (PMSPs) and other functional area points of contact (POCs). The review should include updating contract information, applicator certifications, pesticides, and pest management operations to be used on the installation, as well as, updating pesticide use records. The pest management program self-assessment checklist (appendix B) is available as a tool to review compliance issues during the internal review.

1.1.4.2 Off-Site Review

The IPMC may request that a NAVFAC Atlantic Applied Biology PPMC perform a review of regulatory requirements, reporting, and pesticide approval procedures.

1.1.4.3 On-Site Review

The NAVFAC Atlantic Applied Biology PPMC shall perform an on-site review of the entire pest management program every three years to ensure compliance with the IPMP. The review may be performed more frequently if extensive program problems exist.

1.1.4.4 Integrated Pest Management Plan Rewrite

The IPMP should be rewritten every five years to reflect new contracts, personnel, pest management practices, and regulatory changes.

1.2 INSTALLATION BACKGROUND

The Seabees have been the military construction arm of the U.S. Navy since 1942. Naval Construction Battalion Center (NCBC) Gulfport is home to the Atlantic Fleet Seabees.

1.2.1 Mission

The mission of NCBC Gulfport is to maintain and operate facilities and provide services and material in support of naval construction force units, to include amphibious construction fleet units, the maritime prepositioning force (enhanced), and other fleet and assigned organizational units deployed from or

homeported at NCBC Gulfport, and to perform such other functions and tasks as may be assigned by higher authority.

1.2.2 Location and Facilities

The installation is located within the city of Gulfport, MS with outlying areas in Pascagoula (Lakeside Support Facility), and Biloxi, MS (Woolmarket Rifle and Pistol Range). More than 45 tenants call NCBC Gulfport home. This plan also covers pest management operations at the Naval Special Warfare Group 4 Western Maneuver Area (WMA) joint training facility at the John C. Stennis Space Center. Situated in Hancock County, Stennis Space Center is a large testing area under the ownership of the National Aeronautics and Space Administration.

1.3 PEST MANAGEMENT PROGRAM OVERVIEW

The pest management program is summarized below.

1. The installation IPMC is an employee in the public works department (PWD).

2. General pest control services for the installation are provided in-house by the PWD pest control shop.

3. Grounds maintenance services are provided through contract with GSE Facility Services.

4. Subway receives contracted pest control services from Redd Pest Solutions.

5. Public-private venture housing contracts with Knox Pest Control for general pest control services and Davey Tree Expert Company for landscaping services.

6. Preventive medicine technicians from the Naval Branch Health Clinic perform food service sanitation, facilities habitability inspections, and oversee programs to prevent vector-borne and other infectious diseases.

7. The natural resources manager, a DOD-certified pesticide applicator, sits at Stennis Space Center where he oversees management of the WMA.

1.3.1 Pest Management Objectives

The objectives of the installation's pest management program are:

1. The prevention of pest-related health and safety problems that affect the mission.

   Examples of health-related pests that may affect the mission include, but are not limited to mosquitoes, fire ants, and bed bugs. Any pest may impact the mission when its numbers become excessive. Prevention of pest-borne disease and injury is a component of force health protection (FHP). Force health protection seeks to maintain a healthy and fit military and civilian force in order to maintain the highest levels of readiness. Pest management is a force multiplier for construction battalions, maintenance commands, and other deployable units. Additionally, the military and civilian infrastructure on the installation must be protected in order to provide the necessary support to these units as well.

2. The prevention of pest damage to equipment and subsistence used to support the operational mission of the activities and tenant commands.

Equipment and materials are susceptible to physical damage by pests and the financial costs of such damage can be high. Rodents, for example, can cause considerable damage to electronic equipment through gnawing on electrical components. Examples of pests that may damage equipment and subsistence include, but are not limited to rodents, wood-destroying pests, and stored-product pests.

3. Vegetation management to protect the local environment.

   The introduction of non-native/invasive species of plants can increase the risk of fire and degrade the surrounding native environment that is home to a number of endangered and threatened animal and plant species.

4. The protection of government real property, materiel, and aesthetics.

   Buildings and roads that form the infrastructure of the installation are susceptible to pests. If not adequately prevented and controlled, termites can cause extensive damage to wood structures. Weeds can cause damage to roadways and increase the risk of fire.

5. The reduction of the use of and dependence on pesticides.

1.3.2 Program Requirements

1.3.2.1 Administration

Proper administration of the pest management program ensures accountability and documentation through planning, record keeping, reporting, training, pesticide and contract approval, and regulatory compliance. Table 1-1 outlines the pest management administrative program requirements.

Requirement	Description	Reference	Responsibility	Locator
PLANNING	Review and revise the Integrated Pest Management Plan annually.	• OPNAVINST 6250.4C • DODI 4150.07	• IPMC	Section 1.2
RECORDING	Record all pest management operations conducted on the installation after each operation.	• OPNAVINST 6250.4C • DODI 4150.07 • 7 C.F.R.§110*	• All pesticide applicators	Section 2.3.1
MAINTAINING	Maintain records of all pest management operations conducted on installation on-site indefinitely.	• OPNAVINST 6250.4C • DODI 4150.07 • 7 C.F.R.§110*	• IPMC in coordination with PMPARs	Section 2.3.2

Table 1-1. Pest management administrative program requirements. (Sheet 1 of 2)

Requirement	Description	Reference	Responsibility	Locator
REPORTING	Compile and report all pest management operations to NAVFAC Atlantic Applied Biology monthly.	• OPNAVINST 6250.4C • DODI 4150.07 • 7 C.F.R.§110*	• IPMC in coordination with PMPARs	Section 2.3.3
PESTICIDE APPLICATOR CERTIFICATION	Ensure that all personnel applying pesticides on installations have current DOD pesticide applicator certification if in-house or state commercial applicator certification if contracted.	• OPNAVINST 6250.4C • DODI 4150.07 • 40 C.F.R.§171*	• IPMC in coordination with PMPARs	Section 2.4
COMPLIANCE	Ensure that all program elements are in compliance with all federal regulations. Navy policy is to comply with local/state regulations.	• OPNAVINST 6250.4C • DODI 4150.07	• IPMC in coordination with PMPARs	Section 3.3
PESTICIDE APPROVAL	Compile and submit list of requested new pesticides to NAVFAC Atlantic Applied Biology for approval for use on the installation.	• OPNAVINST 6250.4C • DODI 4150.07	• IPMC in coordination with PMPARs	Section 2.2
CONTRACT REVIEW	Review pest management contract specifications for compliance with the Integrated Pest Management Plan and submit to NAVFAC Atlantic Applied Biology for final review and approval prior to advertising.	• OPNAVINST 6250.4C • DODI 4150.07	• Facilities Support Contracting personnel • PMPARs	Section 2.5
• * (applies to restricted-use pesticides only)				

Table 1-1. Pest management administrative program requirements. (Sheet 2 of 2)

1.3.2.2 Operations

Operations are the day-to-day management of pests through pesticides and non-chemical means. Pest management on the installation includes the following categories of operations:

1. Ornamental and turf—Control and management of pests of landscape plants and turf including arthropods, fungi, and weeds.

2. Right-of-way—Control and management of vegetation along roadways as well as vegetation control near fuel farms to reduce fire risk and along fence lines to enhance security.

3. Aquatic Weed Control—Control of vegetation in ponds and ditches.

4. Industrial, Institutional, Structural, and Health-Related—Control and management of pests in and around buildings. Pests may include cockroaches, termites, bees, venomous animals, stored product insects, rodents, and feral animals.

5. Public Health—Control and management of human and animal disease vectors such as rodents, mosquitoes, flies, and fleas.

6. Nuisance Pest Control—Control of insect pests that are a nuisance or annoyance to base personnel, but do not present a health risk.

7. Invasive weeds—Removal of non-native species of plants that are detrimental to native plant and animal habitats.

8. Vertebrate Control—Control of animal predators that prey upon endangered or threatened animals and their habitats, or infest food and material storage.

Each of these operations must meet various requirements that are listed and described in table 1-2.

Requirement	Description	Reference	Responsibility	Locator
INTEGRATED PEST MANAGEMENT	"Federal agencies shall use Integrated Pest Management techniques in carrying out pest management activities and shall promote Integrated Pest Management through procurement and regulatory policies, and other activities."	• 7 U.S.C. § 136r-1	• IPMC • Pesticide applicators	Section 3.1.1

Table 1-2. Pest management operations programs requirements. (Sheet 1 of 4)

Requirement	Description	Reference	Responsibility	Locator
STORAGE	Pesticides kept on installations must be procured and stored in accordance with installation and federal regulations. Navy policy is to comply with local/state regulations.	• OPNAVINST 6250.4C • AFPMB TG 17 • 29 C.F.R.§1910 • 40 C.F.R.§165	• Pest control shop supervisor	Section 3.4.3
CONTAINERS	All containers used to store or transport a pesticide must have the original or copy of the original label attached. Service containers must have attached label identifying: the person responsible for the container, the name of chemical, and the signal word.	• OPNAVINST 6250.4C • DODI 4150.07 • 40 C.F.R.§156	• Pesticide applicators	Section 3.4.5.1
VEHICLES	Must carry pesticide spill kits and properly secure pesticides and pesticide application equipment when not in use.	• OPNAVINST 6250.4C	• Pesticide applicators • Vehicle operators	Section 3.4.3.3

Table 1-2. Pest management operations programs requirements. (Sheet 2 of 4)

Requirement	Description	Reference	Responsibility	Locator
APPLICATION	Only registered pesticides will be used. Applicators must apply pesticides in a manner that ensures safety and protects the environment. A copy of the pesticide label shall be available at the application site.	• OPNAVINST 6250.4C • DODI 4150.07 • 40 C.F.R.§166	• Pesticide applicators	Section 3.4.5
APPLICATOR SAFETY	The installation must provide procedures, medical support, equipment, and supplies to ensure the safety of DOD pesticide applicators during pest control operations.	• OPNAVINST 6250.4C • 29 C.F.R.§1910	• Naval Branch Health Clinic • Safety Department	Section 4.1
OCCUPATIONAL HAZARDS MONITORING	Workplace monitoring shall be conducted by the medical department to ensure a safe and healthful environment for pest management personnel.	• OPNAVINST 6250.4C • OPNAVINST 5100.23G	• Naval Branch Health Clinic	Section 4.1.2.9

Table 1-2. Pest management operations programs requirements. (Sheet 3 of 4)

Requirement	Description	Reference	Responsibility	Locator
CLEANING AND DISPOSAL	Equipment shall be cleaned to prevent health and environmental hazards due to chemical residues. Prevent water from container and equipment rinsing from entering storm drains and water bodies. Dispose of empty containers properly. Manage and dispose hazardous waste and non-hazardous waste properly.	• OPNAVINST 6250.4C • 40 C.F.R.§165 • 40 C.F.R.§260-273	• Pesticide applicators	Section 3.4.6
SPILL PREVENTION	Spill kits should be maintained in pest control shops and on pest control vehicles. Pest management personnel should be familiar with the installation spill contingency plan.	• OPNAVINST 6250.4C • 40 C.F.R.§300	• Pesticide applicators	Section 5.3.4

Table 1-2. Pest management operations programs requirements. (Sheet 4 of 4)

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CHAPTER 2

Program Administration

2.1 ROLES AND RESPONSIBILITIES

The success of the pest management program depends largely on a clear understanding of the roles and responsibilities for the organizations and personnel involved. The following is a listing of the key organizations and personnel and their duties as presented in DOD guidance documents for the implementation of the IPMP.

2.1.1 Commander, Navy Installations Command

The CNIC is responsible for the funding and prioritizing of the pest management program.

2.1.2 Installation Commanding Officer

The installation commanding officer (CO) is responsible for the compliance and enforcement of the pest management program. The installation commanding officer delegates compliance and enforcement of the pest management program to the IPMC via the IPMC designation letter. Responsibilities of the installation CO include:

1. Budgeting for IPMPs, training, operations, and facilities in compliance with legal and DOD requirements
2. Designating an integrated pest management coordinator in writing
3. Implementing and supporting the IPMP
4. Ensuring all pest management operations are conducted safely and have minimal impact on the environment
5. Ensuring an IPM program, minimizing the use of pesticides, is implemented
6. Ensuring the installation's IPM plan and program are in compliance with all applicable federal, state, and local laws as well as DOD regulations.

2.1.3 Integrated Pest Management Coordinator

The IPMC is designated by the installation CO in writing as the advisor to the installation CO and coordinator of all installation pest management activities. The IPMC designation letter is in appendix D. Responsibilities of the IPMC include:

1. Coordinating the installation's pest management program including implementation, maintenance, and annual update of the IPMP

2. Coordinating the rewrite of the IPMP every 5 years

3. Promoting integrated pest management (IPM) in the pest management program to cost-effectively and safely manage pests and to prevent adverse environmental impact

4. Coordinating reporting of all pest management operations on the installation to NAVFAC Atlantic Applied Biology

5. Ensuring current certification and continuing pest management training of pesticide applicators and PMPARs

6. Receiving and compiling lists of new pesticides and uses from all Pest Management Service Providers (PMSPs) on the installation and submitting them to NAVFAC Atlantic Applied Biology for review and approval

7. Maintaining current list of approved pesticides

8. Acting as liaison between installation and Applied Biology and local, state, and federal agencies for pest management and pesticide regulatory issues

9. Ensuring the installation contracting officers submit pest management contract specifications to the Applied Biology PPMC for review prior to advertising.

2.1.4. In-House Pest Control Shop

The in-house pest control shop performs routine pest management on the installation and responds to service requests from tenants. Responsibilities of the shop include:

1. Controlling nuisance, public-health, and structural pests

2. Conducting pest control inside buildings and facilities

3. Conducting pest control on improved grounds.

2.1.5 Environmental Division

The installation environmental division provides oversight on environmental protection and compliance regarding pest management operations. Responsibilities of the department include:

1. Reviewing and approving new pesticides and pest management operations that may adversely impact the environment

2. Conducting internal compliance assessments of the pesticide and pest management program

3. Providing technical review of the IPMP.

As part of the environmental division, the natural resources manager is responsible for managing natural resources at the installation. In this capacity, the manager may be responsible for conducting or contracting some pest management operations (e.g., invasive species management). The role of the natural resources section is further described in the installation's Integrated Natural Resources Management Plan (INRMP). A copy of the INRMP is included on the CD of supporting documents provided with this plan. Responsibilities of the natural resources manager include:

1. Providing information on protected species, endangered or threatened species, noxious or invasive species, and environmentally-sensitive sites

2. Providing guidance on the management of nuisance wildlife.

2.1.6 Facilities Engineering and Acquisition Division

The Facilities Engineering and Acquisition Division (FEAD) prepares, manages, and assesses pest control and grounds maintenance contracts. The performance assessment representative (PAR) monitors and evaluates the performance of contracted PMSPs to ensure that pest control measures are properly applied. The PAR serves as liaison between the contractor and the IPMC. Responsibilities of the FEAD include:

1. Preparing contracts ensuring that all requirements of the IPMP are included in the contract specifications

2. Coordinating with the NAVFAC Atlantic Applied Biology PPMC for a review of pest management contract specifications prior to advertisement for bid

3. Maintaining copy of each contract on file

4. Monitoring pest management contractors; ensuring effective and safe application of pest management practices, identifying and documenting discrepancies, and seeking corrective action with contractors in accordance with the contract

5. Ensuring contractors record all pest management activities and submit reports including actual pesticide use through the NAVFAC Online Pesticide Reporting System (NOPRS) or to the IPMC on a monthly basis.

All PMPARs shall be delegated the authority (in the contract and in the PMPAR appointment letter) to halt any contract pesticide applications that:

1. Endanger or present a hazard to humans, animals, or the environment

2. Violate contract specifications, or applicable federal, state, DOD, or Navy laws/regulations

3. Violate the pesticide label.

2.1.7 Naval Branch Health Clinic

This section discusses responsibilities of the Naval Branch Health Clinic.

2.1.7.1 Preventive Medicine

The Naval Branch Health Clinic provides public health support to the installation in accordance with Navy Medical (Command) (NAVMED) P-5010, Manual of Naval Preventive Medicine, and OPNAVINST 6250.4C. Responsibilities of the health clinic include:

1. Acting as advisor and liaison to the installation CO for public health pest prevention and management

2. Conducting surveys for pests of medical importance, such as cockroaches, mosquitoes, bed bugs, etc., through habitability and food service sanitation inspections

3. Establishing and maintaining liaison with local health agencies as they pertain to vector management and vector-borne and zoonotic disease prevention

4. Maintaining current certification as DOD category 8 (public health) pesticide applicator

5. Developing and maintaining an emergency plan for vector and pest control during a vector-borne disease outbreak or disaster

6. Providing technical review of the IPMP.

2.1.7.2 Occupational Health and Industrial Hygiene

Naval Branch Health Clinic occupational health personnel coordinate with Naval Hospital Pensacola's industrial hygiene (IH) department for a wide variety of programs. Occupational health personnel are responsible for performing all necessary medical surveillance (such as physical examinations and blood testing) for government pest management personnel, as deemed necessary. Industrial hygiene personnel perform surveys (i.e., for pest management employees) to characterize occupational exposures (i.e., to inherent chemical, physical, ergonomic, and biological stressors) and control measures (e.g., engineering–local exhaust and mechanical dilution ventilation systems; administrative–warning signs, standard operating procedures, training requirements, etc.; and personal protective equipment–respiratory protection and chemical resistant clothing). In addition, IH surveillance information is used to initiate, continue, or end medical surveillance.

2.1.8 Contract Pest Management Service Providers

Contract PMSPs are required to be certified as pesticide applicators by the State of Mississippi. These responsibilities apply to all contractors on the installation. Responsibilities of contract PMSPs include:

1. Conducting pest management operations in accordance with the contract specifications or lease agreements and the IPMP and in compliance with federal and state laws and regulations

2. Submitting a list of pesticides proposed for use on the installation to their government representative

3. Communicating all pest management issues and requirements via the government representative

4. Submitting daily pest management operation records to the government representative or through NOPRS.

2.1.9 Morale, Welfare, and Recreation

Morale, welfare, and recreation (MWR) provides recreational activities for military and civilian personnel on the installation. This includes maintenance of the recreational areas. Additionally, MWR oversees commercial food concessions including the Beehive All Hands Club, Anchors and Eagles Club, The Grill, and movie theater concessions. With respect to recreational area maintenance, MWR must:

1. Ensure that all personnel who apply pesticides maintain current certifications in the appropriate categories (see section 2.4 for more information)

2. Ensure that all pesticides are approved, prior to use, by the NAVFAC PPMC

3. Provide copies of the pesticide labels to the IPMC

4. Maintain and report records of all pesticide applications in accordance with the requirements outlined in this IPMP

5 Maintain the pesticide storage and mixing facility in accordance with the requirements of this IPMP and installation regulations

6. Obtain adequate supplies of pesticides, pesticide dispersal equipment, and personal protective equipment (PPE), and ensure equipment is properly maintained

7. Ensure that all pesticide applicators practice IPM

8. Ensure that landscape cultural management practices are used to maintain the health of plants and turf to prevent disease and pest infestations

9. Ensure that new plants brought onto the installation for landscaping in recreational areas are not invasive, infested with pests, or infected with disease.

With respect to MWR food establishments, MWR must:

1. Ensure that proper sanitation is maintained in all food handling facilities

2. Submit any contract specifications (outside of the installation pest management contract) for pest management to the IPMC for technical review prior to submitting the contract for bid

3. Ensure that only current, state-licensed pesticide applicators apply pesticides

4. Ensure that all pest management activities are reported in accordance with the requirements outlined in this IPMP (for pest management that is conducted separately from the installation contract).

2.1.10 Navy Exchange

The Navy Exchange (NEX) displays and sells household and garden pesticides for retail sale. Additionally, the NEX runs commercial food concessions. With respect to pesticide sales, the NEX must:

1. Ensure that pesticides are displayed in accordance with the pesticide label and other federal, state, and local regulations.

2. Ensure that store employees are properly trained on emergency procedures in the event of a pesticide spill.

With respect to food concessions, the NEX must:

1. Ensure proper sanitation is maintained in all food handling facilities

2. Submit any contract specifications (outside of the installation pest management contract) for pest management to the IPMC for technical review prior to submitting the contract for bid

3. Ensure only current, state-licensed pesticide applicators apply pesticides

4. Ensure all pest management activities are reported in accordance with the requirements outlined in this IPMP (for pest management that is conducted separately from the installation contract).

2.1.11 Commissary

The commissary not only sells food and healthcare items, but also household pesticide items. The commissary must:

1. Ensure proper sanitation is maintained in the store
2. Ensure food items for sale are free from stored product pests
3. Ensure commissary facilities are surveyed and controlled for invading pests
4. Coordinate with the Army Veterinarian on pest or sanitation problems
5. Ensure that pesticides are displayed in accordance with the pesticide label and other federal, state, and local regulations
6. Ensure store employees are properly trained on emergency procedures in the event of a pesticide spill.

2.1.12 United States Army Veterinary Services

Naval Construction Battalion Center Gulfport does not have a veterinary services department on site, but may utilize the clinic at Keesler Air Force Base in Biloxi, MS if necessary. The veterinary services department provides clinical support for military working dogs and services for privately-owned pets and animals. Veterinary technicians out of NAS Pensacola provide food inspection for the commissary and for other food items delivered to the installation. Responsibilities of the veterinarian include:

1. Conducting surveillance for pests which damage, destroy, and contaminate food stored in the commissary and installation facilities
2. Ensuring stored field rations (e.g., meals, ready to eat (MREs), etc.) are free from pests
3. Advising preventive medicine (PREVMED) and the IPMC of any zoonotic diseases that may require pest management
4. Providing advice and education to pet owners on preventing pest infestations.

2.1.13 Public Private Venture Housing

The public-private venture (PPV) housing manager provides pest control and landscape maintenance for military family housing residents.

1. Ensure that pesticide usage reports for outdoor pesticide applications (including herbicides) are forwarded to the IPMC or the NAVFAC Atlantic PPMC, or reported using NOPRS
2. Ensure that only current, state-licensed pesticide applicators apply pesticides.

2.1.14 Building Occupants and Barracks/Housing Residents

All installation personnel have the responsibility for:

1. Apply good sanitary and pest exclusionary practices to prevent pest infestations

2. If permitted for personal use, use pesticides in accordance with the pesticide label

3. Coordinate and cooperate fully with PMSPs in scheduling pest management and preparing the areas for pesticide treatment if necessary.

2.2 PESTICIDE APPROVAL

Only pesticides approved by both the Environmental Protection Agency (EPA) and the state shall be used. Additionally, DOD and Department of the Navy (DON) directives require installations to submit a list of all pesticides that will be used during control operations to the cognizant NAVFAC Atlantic PPMC for review and approval (OPNAVINST 6250.4C, paragraph 4). The purpose of this approval process is to ensure that only registered pesticides which are safe, effective, and appropriate for the site will be used on the installation. Requests for pesticide approval will be submitted to the NAVFAC Atlantic PPMC via the installation IPMC using NOPRS (see section 2.3.3). Once a pesticide is approved, it may be used on-site as per the label directions. New pesticides may also be added to the list and submitted for approval as needed. The list should be reviewed and updated annually by the IPMC as part of the IPMP maintenance. Pesticides currently approved for use on the installation are listed in appendix C.

The IPMC shall maintain a hard copy or electronic version of the manufacturer's label and safety data sheet (SDS) for each pesticide on the pesticide authorized use list (AUL). The PMPARs or the PMSPs should also maintain copies. Pesticide labels and their registration status can be found on the EPA's National Pesticide Information Retrieval System at http://ppis.ceris.purdue.edu/.

2.3 RECORDS AND REPORTING

All shore installations and units performing pest control operations shall maintain daily records of pesticide applications and submit reports of pest management operations monthly to the cognizant PPMC. (OPNAVINST 6250.4C, paragraph 23 and OPNAV M-5090.1, paragraph 24-3.4)

2.3.1 Pest Management Record Keeping

All PMSPs shall record pest management operations daily. Records shall include all pest management operations including surveys and non-chemical control operations performed on the installation by commercial contractors as well as work performed by DOD pest management personnel. The records will include the following information: date of application, location and site, type of operation, target pest, area treated, name of applicator, pesticide information (trade name, active ingredient, and formulation), amount of pesticide applied, and calculated pounds of active ingredient applied. The following operations are excluded from the record keeping requirement:

1. Personal use of insect repellent

2. Application of repellent by deployable units during mass treatment of clothing and tentage

3. Application of pesticides for personal relief by residents of military housing

4. Application of pesticides for flea and tick control to pets by pet owners and veterinary services.

Records shall be submitted to the IPMC monthly via the NAVFAC Online Pesticide Reporting System (section 2.3.3)

2.3.2 Maintaining Pest Management Operations Records

The installation must archive complete daily pest management operation records on-site indefinitely. Pesticide applications for each building, structure, or outdoor site must be accounted for. Past hardcopy records must be archived so as to prevent them from being destroyed. Electronic records shall be stored to prevent destruction or loss; back-up copies are recommended. All records reported to NAVFAC Atlantic will be stored and may be used as a back-up. Downloading records from NOPRS at least annually and maintaining them on-site is highly recommended.

2.3.3 Pest Management Service Provider Reporting Procedures

Reports will be reviewed by the IPMC and the NAVFAC Atlantic PPMC to provide program oversight to the installation and to generate data for tracking overall DON pesticide usage.

All PMSPs that have Internet access must use the NAVFAC Online Pesticide Reporting System to record, report, and manage pesticide and pest management records. This system is preferred to other methods because it eliminates the need to send hardcopy or electronic records to the IPMC and then to the PPMC. The records are entered directly into a central database that can be accessed by the PPMC and the IPMC and downloaded into a spreadsheet. The only computer requirement is reliable Internet access. Integrated pest management coordinators must contact the NAVFAC Atlantic PPMC to establish a supervisor account. Pest management service provider's applicators can then contact the IPMC to request an applicator account. The NOPRS Web site is at: https://clients.saic.com/PestManagementNET/. The NOPRS PowerPoint tutorial is included on the CD of supporting documents provided with this plan.

2.4 TRAINING, CERTIFICATION, AND LICENSING

Integrated pest management requires personnel who are properly trained to investigate and diagnose pest problems, select the appropriate pest management method, apply the appropriate pesticide, perform these operations so that they are safe to humans and the environment, and educate and advise their customers on pest prevention methods. All installation pest management personnel who apply or supervise the application of pesticides shall be trained and certified within two years of employment in accordance with the DOD Plan for the Certification of Pesticide Applicators, or EPA-approved state certification plan (OPNAVINST 6250.4C, paragraph 11). Additionally, professional pest management personnel shall be certified if their duties include:

1. Making recommendations for the use of pesticides, applying pesticides, or directly supervising the application of pesticides

2. Conducting demonstrations on the proper use and techniques of pesticide application or the supervision of pesticides

3. Conducting field research that includes using or supervising the use of pesticides.

An exception to the standard training and certification requirements are those individuals approved by the IPMC to apply ready-to-use pesticides as part of the self-help program.

2.4.1 Verification of Qualifications

Copies of contractor or lessee state licenses shall be obtained from all PMSP personnel applying pesticides on the installation. Verification of DOD pesticide applicator certifications, as well as IPMC and

PMPAR accreditation, can be obtained from the NAVFAC Atlantic PPMC. A list of applicator certifications as well as a list of pest control business licenses is found in appendix D.

2.4.2 Requirements for Department of Defense Pesticide Applicators

DOD applicators may be certified in the following categories:

1. Category 2—Forestry
2. Category 3—Ornamental and Turf (landscape arthropod and vertebrate pests)
3. Category 5—Aquatic (aquatic weeds in lakes, ponds, rivers, streams, irrigation canals)
4. Category 6—Right-of-Way (weeds on sidewalks, along fence lines, parking lots, road ways, storage tank grounds)
5. Category 7—Industrial, Institutional, Structural, and Health-Related (termites and other wood-destroying insects, cockroaches, crickets and other invading organisms)
6. Category 8—Public Health (mosquitoes, ticks, fleas, rodents)
7. Category 11—Aerial Application (application of pesticides for any pest by fixed or rotary-wing aircraft).

Preventive medicine technicians (PMTs) are required to be certified only in Category 8 and receive certification during PMT school. Golf course applicators are only required to be certified in categories 3, 5, and 6.

Initial certification in categories 2, 3, 5, 6, 7, and 8 for civilian employees is a three and a half week course conducted by a designated DOD training agency. The Navy course is conducted by the Navy Entomology Center of Excellence (NECE) in Jacksonville, Florida. Initial certification and recertification in category 11 is a one week course conducted by the Air Force Reserve. Certification for all categories is valid for three years. With proper justification, certifications can be extended for an additional six months by the applicator's certifying authority. Recertification courses for civilians in all categories except category 11 are conducted annually by NAVFAC Atlantic. Initial and recertification course schedules can be viewed at http://www.afpmb.org/pubs/courses/courses.htm.

2.4.3 Requirements for Commercial Contract Applicators

"Licensed firms shall perform all pest management services procured by contract using only trained operators who are certified in the applicable state in the required EPA pest management categories for the work planned. Copies of state or host nation business licenses and applicator certifications shall be reviewed prior to award" (OPNAVINST 6250.4C, paragraph 15b). Copies of contractor business licenses and applicator certificates can be found in appendix D. All contract pesticide applicators applying pesticides on the installation must hold a state commercial or government pesticide applicator's license. Mississippi pesticide applicator categories equivalent to DOD categories are found in table 2-1. The Bureau of Plant Industry (Pesticide Program) within the Mississippi Department of Agriculture and Commerce (MDAC) certifies applicators, registers pesticide products, and licenses pesticide businesses. More information can be found at: https://www.mdac.ms.gov/bureaus-departments/plant-industry/pesticide-program/.

2.4.3.1 Grounds Maintenance and Golf Course

To apply pesticides or herbicides on the installation for grounds maintenance, the contracted pesticide applicator must hold a pesticide applicator license in the appropriate categories issued by the MDAC Bureau of Plant Industry.

2.4.3.2 Structural Pest Control (General Pest Control)

Applicators applying pesticides inside and outside buildings to control household or structural pests must hold a pesticide applicator license in the appropriate categories issued by the MDAC Bureau of Plant Industry.

2.4.3.3 Mosquito Control

Applicators conducting mosquito control must have a pesticide applicator license issued by the MDAC Bureau of Plant Industry.

DOD		Mississippi	
2	Forest	II	Forestry Pest Control
3	Ornamental and Turf	III	Ornamental and Turf Pest Control
5	Aquatic	V	Aquatic Pest Control
6	Right-of-Way	VI	Right-of-Way Pest Control
		VII-3	Industrial Weed Control
7	Industrial, Institutional, Structural, and Health-Related	VII	Industrial, Institutional, Structural and Health Related Pest Control
8	Public Health	VIII	Public Health Pest Control
11	Aerial Application	XI	Aerial Application
No DOD equivalent		I-A	Ag Pest Control – Plant
		I-B	Ag Pest Control – Animal
		IV	Seed Treatment Pest Control
		VII-4	Fumigation
		IX	Regulatory (Pesticide Dealer)
		X	Demonstration and Research
		XII	Wood Preservation Pest Control
		XIII	Anti-Fouling Paint Pest Control
		XIV	Metam Sodium Pest Control

Table 2-1. Mississippi pesticide applicator certification categories and DOD equivalents.

2.4.4 Requirements for Natural Resource Management Applicators

Commercial contract applicators applying herbicides for invasive weed control or habitat restoration must hold a state license. Personnel using pesticides for wildlife control must also hold an appropriate state license. Department of Defense employees applying pesticides for invasive weed control or habitat restoration should be DOD-certified as a pesticide applicator.

2.4.5 Requirements for Performance Assessment Representatives

Pest management performance assessment representatives (PMPARs) assess the performance of contractors in the Performance-Based Acquisition (contracting) Program. The installation is required to train personnel to provide performance assessment for commercial pest control or grounds maintenance services in pest management within one year of appointment and send them to refresher training every three years (OPNAV M-5090.1, paragraph 24-3.19). Naval Facilities Engineering Command provides initial and refresher PMPAR training annually. The training schedule is available at the Armed Forces Pest Management (AFPMB) Web site at: http://www.afpmb.org/content/training-and-certification.

2.4.6 Requirements for Integrated Pest Management Coordinators and Environmental Personnel

"The IPMC shall have the educational background, technical knowledge, and management skills to implement and oversee the pest management program" (DODI 4150.07, section E.4.4.1). Newly designated IPMCs are required to receive training in the administrative and operational requirements of installation pest management. Environmental personnel who have compliance oversight of pesticides on the installation should also receive training. The initial PMPAR and IPMC course provides the necessary training. Naval Facilities Engineering Command, Atlantic conducts these courses annually. If applying pesticides or recommending pesticide applications, the IPMC must be certified as a DOD pesticide applicator. Training schedules are available at: http://www.afpmb.org/pubs/courses/courses.htm#pestmgmtquaassurance.

2.5 PEST MANAGEMENT CONTRACTING

Contracts requiring the use of pesticides must be reviewed and approved by the NAVFAC Atlantic Applied Biology PPMC. This includes contracts issued by non-appropriated activities and tenant commands on the installation. Pest control contracts are required to be monitored by a trained PMPAR (OPNAVINST 6250.4C, paragraph 1).

2.5.1 Pest Management Contracts

2.5.1.1 Grounds Maintenance Contract

The installation has a grounds maintenance contract in place under the BOS contract. Grounds maintenance work includes the use of pesticides (herbicides) to control weeds in semi-improved and improved grounds including rabbit runs, substations, fence lines, railroads, thermal lines, parking lots, ditches, and ponds. The contractor also uses non-chemical methods of weed control such as line trimming. To put in a call for grounds maintenance services, personnel must contact the public works call center at 1-855-462-8322. The names of the current contract companies are listed in appendix D.

2.5.1.2 Miscellaneous Pest Management Contracts

Subway contracts independently with Redd Pest Solutions for pest management services.

2.5.2 Contract Specifications and Review

Pest management contract specifications must be written to ensure effectiveness, safety, and regulatory compliance. The facilities support contract/base operation support (FSC/BOS) performance-based contract template for pest control (sub-annex 1503020) and grounds maintenance (sub-annex 1503050) is available from NAVFAC Atlantic or on the NAVFAC Portal (requires login) at:

https://hub.navfac.navy.mil/webcenter/portal/pw/FSC+Mgmt+and+Facility+Services++/FSC/BOS+Templates. The facilities contracting officer (KO) or contracting officer representative (COR) can provide additional information. The KO shall send the contract specifications to the NAVFAC Atlantic PPMC for review prior to sending the contract out for bidding (OPNAVINST 6250.4C, paragraph 4).

Termite pretreatment contract specifications for new construction shall also be reviewed by the NAVFAC Atlantic PPMC prior to procurement. The Unified Facilities Guide Specifications (UFGS) 31 31 16 Soil Treatment for Subterranean Termite Control should be included in all new construction contracts for termite pretreatment. See section 3.2.4.3 for more information on termite treatment contracts.

2.5.3 Government Representatives

Contractors will communicate and submit required pest management reports via their government representative. For the pest control and grounds maintenance (FSC/BOS) contracts, the representative is the PMPAR who is responsible for assessing the contract. For Non-Appropriated Fund Instrumentality programs (NAFI) (i.e., NEX, MWR) contracts, the representative is the local NAFI organization manager. In cases where a government representative is not available, the installation IPMC may liaison with a contractor's representative.

2.5.4 Contract Requirements

The application of pesticides on Navy properties by contractors is strictly regulated by Department of Defense and Navy regulations, this IPMP, and state regulations. These requirements apply to all pesticide applications including insecticides, herbicides, fungicides, molluscides, etc. to any area in or outdoors. These requirements apply to any size contract (small purchase or facility support contract generated) and services acquired by any other means including government purchase cards (EBUSOFFINST 4200.1, chapter 6, paragraph 7). The specific requirements for contracted pest control operators working on Navy properties are:

1. Contractor Work Plan (CWP): If required by the contract, a CWP shall be submitted as part of the contractor's proposal. The CWP specifies how the contractor will meet the contract requirements.

2. Pesticide Applicator Certification: All contractor personnel, who apply pesticides (which include all herbicides), shall be certified/licensed in the appropriate applicator category in accordance with section 2.4.4 of this IPMP. All contractors who will apply pesticides shall, prior to the start of work, supply a copy of the certificate(s)/license(s) in accordance with contract specifications. Pesticide business licenses and pesticide applicator certificates are included in appendix D of this IPMP.

3. Pesticide Approval: Pesticides used by contractors must be approved and added to the installation pesticide AUL, before use, by the NAVFAC Atlantic PPMC as described in section 2.2. The list of proposed pesticides shall be included in the CWP or submitted to the designated Government representative using the format designated in the contract specifications. The pesticide AUL is in appendix C of this IPMP.

4. Pesticide Mixing, Storage, and Disposal: Contractors shall not store, mix, or dispose of pesticides or clean pest control equipment on the installation unless an approved pesticide storage and mixing area is specified in the contract and authorized by the KO. One exception to this is soil treatment for termite prevention during building construction; the contractor must mix the termiticide on-site while the PMPAR or IPMC is there to witness.

5. Pesticide Applications: Only pesticides listed on the pesticide AUL shall be used and applied in a manner consistent with the pesticide label.

6. Pest Management Reporting: Contractors shall submit reports in accordance with the reporting requirements in section 2.3.3.

7. Contractor Vehicles:

    a. Safety equipment: Vehicles used to transport pesticides shall be equipped with a fire extinguisher and a spill and decontamination kit, and be capable of cleaning up the maximum amount of pesticide transported at any given time. Clean water shall be carried for use in emergency personal decontamination.

    b. Security: All pesticides carried on the vehicles shall be secured in locked compartments at all times. Vehicles shall not be left unattended at any time unless properly locked and secured.

    c. Identification: Vehicles will be clearly marked as pest control vehicles.

    d. Appearance: All vehicles shall be maintained with a clean and orderly appearance, free from observable pesticide spills, residues, or build-up.

    e. Transporting pesticides: Pesticides shall not be transported in the cab or occupied part of any vehicle. They shall always be carried in a separate compartment from the occupied cab.

8. Compliance Assessment: All contractors are subject to regulatory compliance assessments by the PMPAR, IPMC, environmental compliance staff, and other authorized government personnel. Pest control vehicles, pesticide applications, and administrative requirements are subject to inspection. Authorized government personnel may also require the contractor to stop work if the work is not being performed in a safe manner.

2.5.5 Contract Performance Assessment

Contracts shall be assessed by a trained PMPAR to ensure environmental and contractual compliance. For FSC/BOS contracts, Functional Assessment Plans for pest control and grounds maintenance should be developed and implemented. Functional Assessment Plan templates are available from the KO or NAVFAC Atlantic Applied Biology. Periodic assessments for pests prior to, during, or after pest control operations should be conducted to ensure efficacy of the services. Pest survey methods for contract performance assessments are found in chapter 8 on each of the Integrated Pest Management Sheets. Periodic assessment of the contractors during pesticide application should also be conducted to ensure appropriate safety measures are being taken. The contractors' vehicles and equipment must be made available for inspection when requested. In the absence of a PMPAR, a preventive medicine technician can provide information on the efficacy of pest control in some facilities. The PMT conducts monthly inspections that include pest surveys of food service facilities and child development centers. The PMPAR and the IPMC should liaison and coordinate performance assessment activities with the PMT.

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CHAPTER 3

Operations

3.1 INTEGRATED PEST MANAGEMENT

Presidential Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance, October 5, 2009, requires federal agencies to promote pollution prevention and eliminate waste by implementing integrated pest management and other appropriate landscape management practices. United States Code (7 U.S.C. § 136r-1) states, "Federal agencies shall use Integrated Pest Management techniques in carrying out pest management activities and shall promote Integrated Pest Management through procurement and regulatory policies, and other activities." Department of Defense policy is to, "Incorporate sustainable Integrated Pest Management (IPM) philosophy, strategies, and techniques in all aspects of DOD and Component vector control and pest management planning, training, and operations, including installation Integrated Pest Management Plans and other written guidance to reduce pesticide risk and prevent pollution" (OPNAVINST 6250.4C).

3.1.1 Integrated Pest Management Defined

Integrated pest management is, "a planned program incorporating education, continuous surveillance, record keeping, 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 habitat modification, biological, genetic, cultural, mechanical, physical, and regulatory controls, and when necessary, the judicious use of least hazardous pesticides" (OPNAVINST 6250.4C, paragraph 2). There are significant differences between IPM and traditional pest control methods. Table 3-1 lists some of the differences.

In IPM programs, treatments are not made according to a predetermined schedule. Rather, treatments are made only when and where monitoring has indicated that the pest will cause unacceptable economic, medical, or aesthetic damage. Treatments are chosen and timed to be most effective and least hazardous to non-target organisms and the general environment.

Pest Management	Traditional Pest Control	IPM
Program Strategy	Reactive	Preventive
Customer Education	Minimal	Extensive
Potential Liability	High	Low
Emphasis	Routine pesticide application	Pesticides used when exclusion, sanitation, and other non-chemical methods are inadequate
Inspection and Monitoring	Minimal	Extensive
Pesticide Application Frequency	By schedule	By need
Pesticide Application Target	Area-wide spraying	Spot treatment of areas where pests are found
Customer Involvement in Preventing Pests	Minimal	Extensive

Table 3-1. Comparison of traditional pest control and integrated pest management methods.

Under an IPM program, execution of individual pest management practices involves the following steps:

1. Identify pests.

2. Establish action thresholds that are sufficient to warrant treatment. In determining threshold levels, the amount of public health, aesthetic, or economic threat that can be tolerated must be correlated with the population size of pests, natural enemies, time in the season, and/or life stage of the pest or host.

3. Develop plans/strategies through an integration of treatment methods that are effective against the pest, least disruptive to natural controls, and least hazardous to human health and the environment.

4. Monitor pest population before and after treatment. Monitoring is an ongoing activity.

5. Implement pest control measures if economic damage or public health threat are above the established action threshold.

6. Document results.

7. Evaluate/redesign plan to determine the outcome of treatment actions.

Controlling pests has traditionally been the responsibility of the pest control operator. Using IPM, preventing and controlling pests is the responsibility of all personnel on the installation.

3.1.2 Integrated Pest Management Compliance

All pesticide applicators are trained in IPM techniques during initial and refresher licensing or certification training. Government representatives shall assess the PMSP's compliance with IPM. This may include:

1. Reviewing the approved pesticide list for use of less toxic pesticides, baits with sustainable control, short-residual and pest-specific products, and products used for spot treatment rather than broadcast application

2. Ensuring contractor work plans and partner pest management plans incorporate IPM

3. Reviewing pest management records to ensure that only approved pesticides are used, spot applications are performed, non-chemical methods are used, and routine surveys are being performed

4. Observing pest control service calls to ensure pest control operators identify conditions conducive to pest infestations, provide information to building occupants on how they can prevent pests, use only approved pesticides, perform spot treatments, properly apply baits, conduct routine surveys, and monitor baits/bait stations/traps.

3.1.3 Integrated Pest Management Sheets

The IPM sheets in chapter 8 provide general guidelines for the integrated control of pests. They may be used as a reference for surveillance and non-chemical and chemical control alternatives.

3.2 CURRENT PEST MANAGEMENT OPERATIONS

Nuisance and health-related pests and vegetation are managed on the installation. Figure 3-1, figure 3-2, and table 3-2 illustrate the frequency of pest management issues and pounds of pesticide active ingredient applied based on the pest management records from fiscal years 2012, 2013, and 2014.

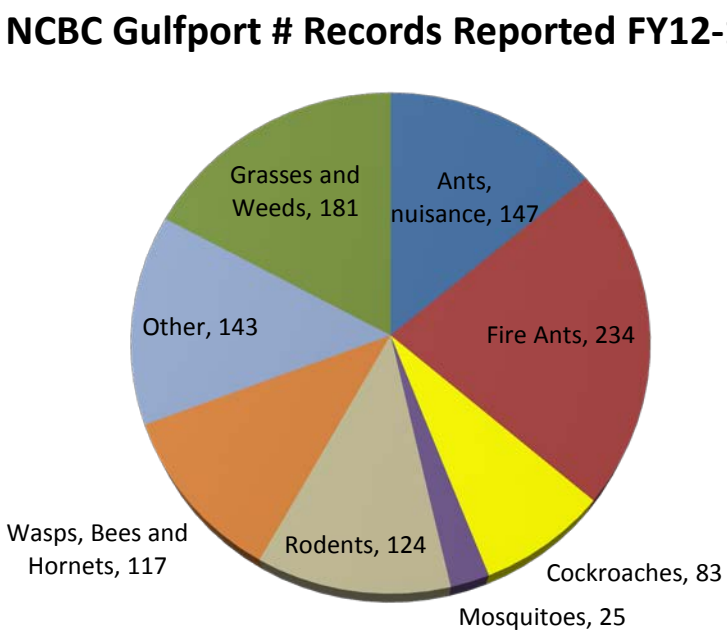

Figure 3-1. Number of records reported via NOPRS for various pest management issues, FY12–14.

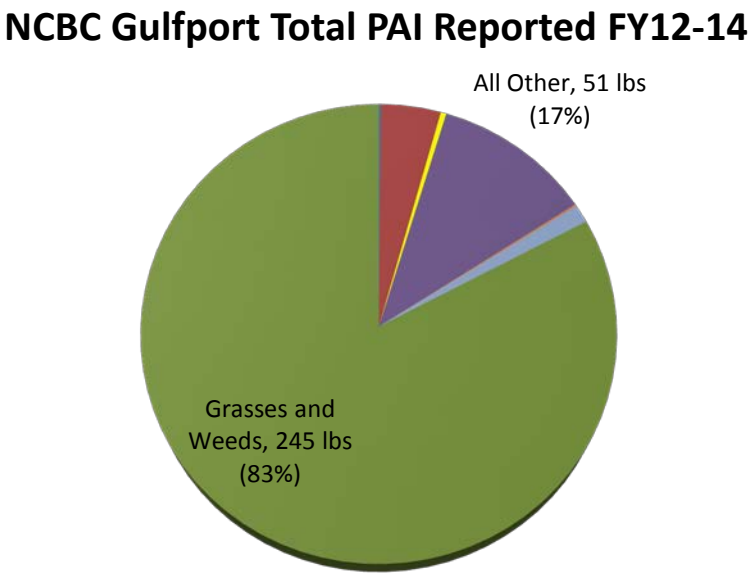

Figure 3-2. Total pounds of active ingredient reported via NOPRS for grounds maintenance versus general pest control operations, FY12–14.

Fiscal Year	Pounds of Active Ingredient (Herbicide) Reported
2012	205
2013	502
2014	17

Table 3-2. Pounds of active ingredient reportedly applied for maintenance of the Western Maneuver Area, FY12–14.

3.2.1 Inspections

Routine inspections provide early detection of pests. Pest inspections should be conducted routinely at all food service, sales, and storage facilities. Preventive medicine technicians conduct food safety inspections including surveys for pests and pest signs at the galleys and food facilities each month. They also inspect the child development center, exchanges, and barber shops. The preventive medicine department provides monthly and quarterly sanitation inspection reports and, if necessary, immediate recommendations to facility managers when contractor-administered pest control operations are needed to control pests. U.S. Army Veterinarian food inspectors conduct food quality inspections that include examining food items for pests at the commissary and at food service and sales locations.

3.2.2 General Household and Nuisance Pests

Sanitation, glue traps, and pest exclusion are the primary sustainable means of non-chemical control. Low-toxicity insecticidal baits are used effectively against cockroaches and ants. Most pesticide applications can be effective in immediate reduction of pest populations, but have short residual efficacy and are not sustainable in the long term.

3.2.2.1 Cockroaches

German and American cockroaches are common pests. The general adaptability of the cockroach makes it both an important pest problem and the most common pest problem in food service areas. An integrated approach of using both preventive and corrective techniques is the only practical means of controlling this pest.

3.2.2.2 Control Measures

Non-chemical preventive control measures—including inspection, interior and exterior facility sanitation, and exclusion methods such as closing harborage areas by caulking or other modifications—reduce pest populations by limiting food, water, and shelter. In buildings that are most susceptible to pest infestation, these measures are performed on a scheduled basis through preventive maintenance contracts. Common use areas and food consumption areas of other buildings, such as restrooms, coffee messes, lounge areas, and vending machine rooms, are serviced on either a monthly or quarterly basis, depending on the preventive maintenance contract for that building, with response to call-backs as necessary. This also includes common use areas of the barracks, warehouses, and administration buildings. Buildings where there is no food and where problems occur only occasionally such as shops and storage buildings, are handled on a service call basis. Pesticide treatments in food handling areas shall be confined to crack and crevice placement when using residual aerosol or dust formulations. Insect growth regulators and baits are used to complement other control measures. Self-contained light traps may also be utilized in these areas. Low-odor formulations are used in offices and in other spaces where a pesticide odor would be objectionable.

3.2.3 Grounds Maintenance

Grounds maintenance is performed on improved or landscaped grounds. Pest management during grounds maintenance may involve weed control; control of pests and disease on plants, trees, and turf; and control of vertebrate animals (e.g., squirrels, moles) that may destroy plants and turf. Mechanical removal of weeds and mowing are routinely performed. Grounds maintenance also includes weed control in drainage ditches that may contribute to mosquito control and bird habitat removal. Weed control is performed along roadways, fence lines, and at fuel farms where they pose fire and visibility concerns.

3.2.3.1 Turf and Ornamental Pests

Turf and ornamental pests include insects and diseases. White grubs and ants infest the soil and roots of plants. Japanese beetles, bagworms, tent caterpillars, sod webworms, and armyworms feed on the leaves of plants. Leafhoppers, scale insects, and aphids are referred to as plant sucking insects and feed on the fluids inside of plants. Oak borers and bark beetles are insects that bore into plants or trees and disrupt the plants' ability to transport nutrition and water. Various plant diseases including brown patch and dollar spot are also possible turf diseases that may be encountered. Ornamental diseases can cause leaf spots, blights, mildews, and wilts from fungi, bacteria, and viruses.

3.2.3.2 Weed Control

A wide variety of herbicides are available for controlling unwanted vegetation. Extreme care should be taken when using herbicides around waterways. Herbicides can be used around mowing obstacles such as signs, fire hydrants, and manholes. Herbicides are used to control weeds along cracks in sidewalks and asphalt parking areas, along fence lines, around buildings, and along ditch banks. Selective herbicides are used to control various weeds that occur in lawns on the installation. Various cultural and chemical controls can be used to deal with these and other weed control problems. When using chemical controls, both selective and non-selective herbicides may be used.

The MDAC has the authority to regulate noxious weeds. A noxious weed is a plant species or classified group of plants declared by the Bureau of Plant Industry to be a public nuisance or to be especially injurious to the environment, to agricultural and horticultural production, or to wildlife, and which should be controlled and the dissemination of which prevented. Mississippi noxious weeds include: Benghal dayflower (*Commelina benghalensis*), Brazilian santintail (*Imperata braziliensis*), Chinese tallow tree (*Sapium sebiferum*), cogongrass (*Imperata cylindrica*), giant salvinia (*Salvinia molesta*), hydrilla (*Hydrilla verticillata*), itchgrass (*Rottboellia cochinchinensis*), kudzu (*Pueraria montana var. lobata*), and tropical soda apple (*Solanum viarum*).

Poison ivy (*Toxicodendron radicans*) and poison oak both occur in Mississippi, although poison ivy is the most common. Sap from either plant can cause an allergic reaction in susceptible individuals. If removing poison ivy by hand, personnel should wear rubber gloves that are washed off with soap and water after handling the plants. Contact with stinging nettles may also cause individuals to react negatively, although usually only for a short duration. Washing the affected area or immediate application of baking soda paste soothes the stinging sensation for most people. Seek medical attention immediately in the event of a severe allergic reaction to contact with either of the described plants.

3.2.3.3 Aquatic Weed Control

Aquatic weed control work should be conducted in accordance with the Integrated Natural Resource Management Plan (INRMP). The policy is to control and limit the spread of invasive species of plants,

and to protect aquatic plant species. Each pesticide must be approved prior to use to prevent harm to the natural resources that feed in these aquatic environments.

The Mississippi Department of Wildlife, Fisheries, and Parks determined the following aquatic species to be detrimental to the state's native resources. Sales and distribution of the following species are prohibited in Mississippi: hydrilla (*Hydrilla verticillata*), egeria (*Egeria densa*), water hyacinth (*Eichhornia crassipes*), rooted hyacinth (*Eichhornia azurea*), eurasian watermilfoil (*Myriophyllum spicatum*), water lettuce (*Pistia stratiotes*), and paperpark (*Melaleuca quinquenervia*).

A recurring concern at the Lakeside Support Facility is the level of algae in the pond. Algae are necessary and beneficial to aquatic ecosystems. They form the food and energy basis for nearly all other aquatic organisms. However, severe algal blooms can be problematic. Extremely high levels of algae can generate enough shade to prevent sunlight from reaching rooted aquatic plants, limiting their growth or even causing them to die. Also, as more algae grow within the pond, there are more dead algae to be decomposed. Decomposition by bacteria consumes oxygen and may decrease or even completely deplete dissolved oxygen contents which can cause fish kills.

It is important to realize that algae occur in natural cycles of abundance in aquatic ecosystems. Blooms of algae should only be considered problematic if they occur with increasing frequency as a direct result of human influence on the environment. Management emphasis should be geared toward maintaining healthy, natural levels of algae within waterbodies. Recurring algae blooms can be limited by 1) reducing the nutrients washing into the pond and 2) using other plants or compounds to absorb nutrients from the water. Licensed applicators can treat algae blooms using properly labeled herbicides, but, unless the nutrients are reduced, the chemical herbicides will provide only temporary control of algae blooms. Also, ponds that are experiencing an algal bloom are more likely to have a fish kill when treated with an herbicide because of the rapid death and decay of the algae, so it is important to provide adequate circulation when ponds develop severe algal blooms.

Read and follow label instructions before using any chemical in water. Applicators may also refer to the publication *2015 Weed Control Guidelines for Mississippi* for specific recommendations, application rates, and water use restrictions. That document is included on the CD of supporting documents provided with this plan.

3.2.4 Structural Pests

Structural pests which have an impact on activity operations include termites, powder post beetles, wood borers, and wood destroying fungi. Of these, subterranean termites and wood destroying (decay) fungi cause the most damage.

3.2.4.1 Structural Control Program

A well-managed structural pest control program includes inspection, prevention, and chemical treatments when needed. All susceptible structures that contain wood or wooden structural members should be inspected on an annual basis. The records should note when a building was inspected, the location of any infestation found, and the description of any treatment performed.

3.2.4.2 Termite Control

Various control techniques as part of an integrated approach to structural pest control include:

1. The use of construction practices which protect wood from attack

2. The control of moisture through proper drainage and ventilation

3. The use of termiticides for barrier treatment of soil and hollow masonry units of building foundations

4. The use of treated wood and or metal and concrete supporting structures

5. The fumigation for extensive drywood termite infestations.

Corrective chemical treatments should be performed when termites are found actively damaging wood. Control operations should be based on annual inspections of buildings and reports of termite swarming from building occupants. All wood that is damaged by termites or wood rot fungi should be replaced with treated wood to prevent future damage.

Top priority is given to preventive control treatments, such as preconstruction termite soil treatments and the use of treated wood to protect wood from attack. Once treated with termiticides, care must be taken to prevent disturbance of the soil barrier within one foot of the foundation (if moved by gardening activity or covered when raised flower beds are installed against a building). This can be a serious problem in housing areas where people are encouraged to beautify their yards. Raised beds must be four-sided (i.e., not using the foundation as one side) and soil within one foot of the foundation can't be cultivated for planting.

3.2.4.3 Administration of Termite Treatment Contracts and Warrantees

Termite treatment contracts shall follow all of the requirements found in section 2.5.4. The NAVFAC Atlantic PPMC should review contract specifications for termite control. Termiticides, when needed, must be applied at the highest EPA-labeled concentration and application rate. Soil treatment for termite prevention will be conducted during building construction in accordance with the Unified Facilities Guide Specifications (UFGS) 31 31 16 (DODI 4150.07, section E.4.7.15.1). In accordance with UFGS 31 31 16, the contractor shall provide a warranty of no less than five years. This ensures that if termite activity is discovered during the five year warranty period, the contractor will re-treat the soil and repair or replace any damage that has been caused by termite infestation. Termiticides used for termite control must be nonrepellent, such as pesticides with the active ingredient of fipronil, imidacloprid, chlorfenapyr, or chlorantraniliprole. DOD-certified pesticide applicators or PMPARs trained in pest control shall inspect applications of pesticides by contractors to control termites or other wood-destroying organisms.

3.2.5 Invasive and Non-Indigenous Species Management

Executive order (EO) 13112 is implemented at DOD installations through DODI 4150.07 (section E4.7.6) which requires that installations prevent, detect, and monitor invasive species. Guidance on the use of available control techniques may be obtained from the installation's NAVFAC Atlantic PPMC.

The Chinese tallow tree (*Triadica sebifera*) is the primary invasive species of concern at Stennis WMA. Information on other invasive species and management strategies can be found in the installation INRMP.

3.2.6 Stored Product Pests

Stored product pests are a potential problem at any installation. Inspection upon receipt of products and rejection of obviously infested materials generally prevents heavily infested material from being placed in the storage area.

3.2.6.1 Dermestid Beetle

If the dermestid beetle (*Trogoderma*) is found in a commodity, the whole lot of food must be condemned. The pointed hairs on the larvae will cause digestive problems if the contaminated food is eaten. An accurate identification of *Trogoderma* is required to condemn the lot. For the most part, sanitation (keeping storage areas clean) and stock rotation minimize or prevent pest infestation. If an infestation is found, the most effective way to control *Trogoderma* is through deep cleaning, vacuuming, and discarding or segregating the infested product while surveying adjacent areas.

3.2.6.2 Storing Meal, Ready-to-Eat Rations

More stringent controls are required for prevention of stored products pests when storing meal, ready-to-eat (MRE) rations. Guidance on this program can be found in AFPMB Technical Guide No. 38, Protecting Meals, Ready-to-Eat Rations (MREs) and Other Subsistence during Storage.

3.2.7 Health-Related Pests

In accordance with OPNAVINST 6250.4C (paragraph 4c), the Naval Branch Health Clinic Preventive Medicine Department is responsible for conducting inspections and surveys aboard the installation to determine the species, source, location, and density of medically-important arthropods and provide the results to the public works and facilities departments for use in planning pest control operations. Mosquitoes, biting flies, and filth flies constitute the most important insect pests for both disease transmission and general annoyance. Controlling these insect pests should be based on a thorough knowledge of the target pest, actionable surveillance data, and compelling evidence of an infestation that poses an emergent public health risk.

3.2.7.1 Mosquito Surveillance

Routine mosquito surveys are the responsibility of preventive medicine technicians. However, if a PMT is not available, a pest control provider can conduct mosquito surveillance. If additional assistance is needed, Navy entomologists from the Navy Entomology Center of Excellence or the Navy Environmental and Preventive Medicine Units can provide assistance in mosquito surveillance. Survey operations are essential to determine the species present, the population level involved, and the potential hazard of disease transmission. Surveys also serve as a valuable tool in evaluating control operations. Mosquito surveillance includes conducting both larval and adult surveys. Larval surveys are important because they determine exactly where mosquitoes are breeding, providing the information necessary to manage or eliminate mosquitoes at the source. Larval surveys involve regular dipping stations that are selected, noted on a map, and inspected periodically throughout the mosquito season. In areas where mosquito control is conducted, random larval sampling should be made to check the effectiveness of the control program.

Adult mosquito surveys may be conducted by either collecting mosquitoes from resting sites or using light traps. Adult collections are then counted and identified to genus or species so the disease transmission risk can be assessed. Adult surveys focus on collecting female mosquitoes because they are the only ones that bite. Female mosquitoes require a blood-meal before they can lay viable eggs. The male mosquito feeds on plant sugars such as nectar, and does not bite. A high proportion of adult males in a trap collection usually will indicate a nearby larval habitat, and a survey of the area should be done to locate possible breeding sites. The Navy Bureau of Medicine and Surgery entomologists, centered at the Navy Entomology Center of Excellence and the Navy environmental and preventive medicine units, are responsible for providing professional guidance, recommendations, and on-site assistance on all technical

matters relating to disease vectors and other medically important pests (OPNAVINST 6250.4C, paragraph 4c).

PREVMED surveys adult mosquitoes on the installation using strategically-placed CDC light traps. Employee and resident mosquito complaints can be made through the call center and then forwarded to PREVMED.

3.2.7.2 Mosquito Control

Mosquito control methods are either permanent (e.g., eliminating the water source) or temporary (e.g., chemical control) in nature and may be directed against larvae or adults. The most effective way to control mosquitoes is to target the larval stage. Larvicides, pesticides specifically labeled to control mosquito larval stages, should be applied to areas where water stands for longer than 7 days when results of mosquito dip counts exceed one larvae per dip. Biological control can be accomplished by the introduction of mosquito fish (*Gambusia* sp.), which are surface feeders that are predaceous on mosquito larvae. *Gambusia* have the ability to outcompete other species, so it is important to consult with the environmental division prior to introducing them, as well as to only introduce them into waters that do not drain into other waterways. To decrease the amount of standing water, it is important to have a drainage system allowing proper runoff of rain water from roadways. Ditches should be maintained free of weed growth. This increases water flow in the ditch allowing access of natural mosquito predators.

This installation performs ultra-low volume (ULV) pesticide applications to control adult mosquitoes on an as needed basis via the in-house pesticide applicator. When female adult mosquito counts exceed 25 per night per trap, ULV pesticide applications should be initiated upon approval from preventive medicine. If a trap count exceeds the threshold, the area surrounding that trap should be surveyed to identify and treat the active breeding site. For most species, mosquito activity is greatest from dusk to dawn. Adult mosquito control efforts should be made during peak mosquito activity. Ultra-low volume treatments must be made during peak mosquito activity when weather conditions are optimal; therefore, ULV pesticide applications should be conducted in the early morning hours before the sun warms the ground or in the evening after the ground has cooled (when temperature inversion usually occurs).

Regular testing of ULV aerosol droplet dispersal is required to assure maximum control, minimum insecticide use, and prevention of automobile finish spotting caused by droplets that are too large. This testing must be done at the beginning of each spray season and for every 50–100 hours of operation, or when the pesticide is changed. More information is included in the AFPMB TG No. 13, Ultra Low Volume Dispersal of Insecticides by Cold Aerosol and Thermal Fog Ground Equipment. Government personnel can obtain slides for aerosol droplet size testing from the Testing and Evaluation Department at the Navy Entomology Center of Excellence, Jacksonville, Florida. Additionally, application of residual insecticides labeled for mosquito control in relatively small areas near the source of the mosquitoes has been shown to be highly effective.

If adult numbers are extremely high or infestations occur in hard to reach areas, aerial control by helicopter or fixed-wing aircraft may be the only effective treatment method available. Refer to section 3.2.7.9 for requirements regarding aerial spraying.

3.2.7.3 Filth Fly Management

Performing routine sanitation is the best method to manage filth flies (houseflies, blow flies, flesh flies, bottle flies, etc.). Removal of refuse and routine cleaning of garbage cans and dumpsters will minimize the problem. Garbage cans and dumpsters should be placed on concrete pads at least 100 feet from facilities to reduce breeding under and around the containers and to minimize access to the facilities.

Continuous monitoring of sanitation conditions in and around food service areas helps assure that significant fly breeding will not occur.

Chemical control of filth flies is short-term and unsustainable. The choice of fly control techniques must be based on an on-site evaluation of the problem. Pest control personnel inspect areas where garbage is handled and treat these locations with approved insecticides when flies exceed control limits. Preventive medicine technicians also inspect these areas and report significant findings to facility managers for corrective action. Exclusion devices, such as screens and air curtains, help prevent the entrance of flying insects into buildings when installed and properly maintained. Aerosol insecticide treatments are provided when adult flies become a problem in indoor spaces. Automated pesticide misting devices are not allowed according to DODI 4150.07 (section E4.10.3). Light trap devices are also helpful for filth fly control in food handling areas, but only when they are placed inside of the building. Use only non-contaminating light traps with some way of containing the dead insects. For more information on filth fly management, see AFPMB TG No. 29, Integrated Pest Management In and Around Buildings.

3.2.7.4 Bed Bug Management

Bed bugs belong to a family of blood-feeding, ectoparasitic insects called *Cimicidae*. They have a number of features that make them very effective pests and difficult to control. Their small, flattened body allows them to hide in inconspicuous places such as cracks and crevices. A female can lay several hundred eggs during her lifetime. Bed bugs can survive a long time without feeding; and many insecticides have been rendered ineffective due to resistance development. The most common way bed bugs are introduced is by the movement of infested items (e.g., bedding, clothing, and luggage) from one place to another. The common bed bug is not known to transmit human disease. For most people, the bite of a bed bug is painless and will usually go unnoticed, though many people can have allergenic skin reactions, ranging in severity from local inflammation and itchiness, to asthmatic symptoms and anemia. Although the common bed bug seems to prefer human hosts, they are also capable of feeding on birds, rodents, or other mammals. While other cimicid species, like bat bugs and swallow bugs, mainly feed on bats or birds, but may incidentally bite people when their usual host abandons the nest or is eliminated from the building.

Bed bugs can be difficult pests to detect without a diligent survey strategy. Bed bugs typically feed at night when the host is asleep, and hide in cracks and crevices during the day. It is very important to thoroughly inspect areas where bed bug infestation is suspected. Typical harborage areas might include mattress seams, box springs, bed frames, night stands, picture frames, loose wallpaper, and curtains. Bed bugs typically travel 5–20 feet from their harborage area to feed. When populations are small, infestations may go unnoticed. Some tell-tale signs of a larger bed bug population include the presence of fecal spotting, shed skins, increased biting frequency, and in serious cases a distinct, obnoxiously sweet, odor produced by the bugs. Persons conducting inspections and surveys should be properly trained on what to look for and where to look for infestations. The NECE and EPMU personnel are available to provide training on bed bug inspections.

Bed bugs are a public health issue; installation preventive medicine department should be contacted immediately. Bed bug control may be more difficult to achieve today with increased travel and more stringent limitations on available control materials. A successful control program will require a carefully planned and integrated approach. For more information on controlling bed bugs see AFPMB Technical Guide No. 44, Bed Bugs—Importance, Biology, and Control Strategies. A copy of the Naval Branch Health Clinic Gulfport Preventive Medicine Protocol for Bed Bugs is included on the CD of supporting documents provided with this plan

3.2.7.5 Rodent Management

Rodent control work is an ongoing program to eliminate the causes of rodent infestations. Major emphasis is placed on sanitation and exclusion to limit the amount of food and harborage available to rodents. Tamper-proof bait stations should be maintained in high infestation areas. There are specific EPA requirements for first generation anticoagulant products (warfarin, chlorophacinone, and diphacinone), second generation anticoagulant products (brodifacoum, bromadiolone, difenacoum, and difethialone), and non-anticoagulants (bromethalin, cholecalciferol, and zinc phosphide). Bait stations are required for all outdoor, above-ground placements and must be placed within 100 feet of man-made structures. Bait stations are also required indoors if exposure to children, pets, or nontarget animals is possible. Mechanical traps (snap traps, glue traps, etc.) are another effective control method. Trapping is an effective way of quickly reducing a large mouse population.

3.2.7.6 Bird Management

Pigeons are the primary bird pests on most installations. Pigeons, English sparrows, and starlings can be controlled without a permit because they are not covered under the Migratory Bird Treaty Act. Other bird species require special permits before any control measures can be taken. Bird control methods vary according to the situation. Bird droppings pose a health hazard, as a possible cause of histoplasmosis and other respiratory problems when airborne. Bird ectoparasites, such as mites, can also fall on installation employees. Ultrasonic devices and plastic owls and snakes, etc. are not effective for bird control. The best alternative for bird control is bird-proofing or the exclusion of birds by closing up all openings. Because of its permanency, bird-proofing (i.e., the placing of hardware cloth and chicken wire over potential roosts) is considered the most cost effective means of control. Population reduction techniques (e.g., destruction of nests accessible by a ladder or cherry picker) can sometimes be used effectively. Repellent chemicals which produce alarm reactions and cause a flock to leave or avoid an area are often used. Control personnel should continually monitor bird population levels and take appropriate control actions when required.

3.2.7.7 Feral Animal Management

Feral or free-ranging domestic cats and dogs are considered by the professional wildlife management community to be one of the most widespread and serious threats to the integrity of native wildlife populations (e.g., birds, bats) and natural ecosystems in North America. Navy commands must prevent feral cat and dog populations, and ensure their humane removal from Navy lands through close coordination and cooperation between natural resources, pest management, security, veterinary, and housing personnel. In accordance with the Chief of Naval Operations Policy Letter Preventing Feral Cat and Dog Populations on Navy Property (10 Jan 2002) and OPNAV M-5090.1, chapter 12, Navy commands shall not allow trap-neuter-release or the release of unwanted house pets on their lands due to the potential of feral or free-ranging cat populations to act as disease reservoirs, threatening human health, native wildlife populations, and natural ecosystems.

Cats may occasionally be found near food handling areas or dwelling in crawl spaces under buildings where they can cause flea problems inside of the buildings. The elimination of available food by keeping garbage cans and dumpsters sealed will decrease the appeal of the area to the cats. Elimination of shelter is also a good means of control. The installation should discourage people from feeding stray cats. Guidance on feral cat management can be found in AFPMB Technical Guide No. 37, Integrated Management of Stray Animals on Military Installations.

The installation's certified pesticide applicator or the Gulfport Police Department Animal Control office may respond to feral animal issues if necessary.

3.2.7.8 Wildlife Management

Native and feral animals can adapt to and thrive within human habitations. The animals may become a nuisance, damage buildings or property, or be a source of human disease transmission. They can also kill native animals and plants or disrupt their habitats. Animals that may be pests at NCBC Gulfport or outlying commands include beavers, bats, nutria, and others. Animal damage control efforts will emphasize the use of integrated pest management techniques which exclude pests and mitigate damage rather than control populations whenever practical. The field use of chemical toxicants which cause secondary poisoning effects is generally prohibited for bird and mammal control by E.O. 11870. The United States Department of Agriculture (USDA) damage control office may be called for wildlife or carcass removal. In cases where they cannot be reached and personnel or equipment may be at risk, the certified pesticide applicator may also be available to remove the animal.

3.2.7.9 Aerial Spraying

Aerial spraying can be conducted to effectively control disease-carrying insects, pest insects, and undesirable vegetation over a large area. Validation for aerial spraying must be obtained from a category 11-certified pest management consultant with BUMED or NAVFAC Atlantic and clearance for aerial spray operations must be obtained from the Federal Aviation Administration. The validation statement and the execution of a requirements type contract should be done before they are required to minimize delays in initiation of control operations.

3.2.7.10 Red Imported Fire Ant

Fire ants are a significant health concern due to their aggressive nature when disturbed and the allergic reaction that occurs in some people. The fire ant's mound building and stinging behavior interferes with recreational and grounds maintenance activities. Bait and residual insecticides are available for control of fire ants. Monthly inspections for fire ant mounds should be made in all improved and unimproved areas, with treatment as necessary. Infested areas should be treated with bait, followed by a drench of any mounds 6–8 weeks later. Any active mounds found in the interim should be retreated. Bait and residual insecticides are available for control of fire ants.

Red imported fire ants are not native to the United States. They first entered the country around 1918 near Mobile, Alabama, and made their way into southern Mississippi by the 1930's. They have since spread to every corner of every county in the state and through most of the southeastern U.S. Restrictions are imposed on the movement of regulated articles from the quarantined areas into or through the non-quarantined areas. A map of the RIFA quarantine can be found on the CD of additional source documents included with this plan. More information can be found on the following Web site: http://msucares.com/insects/fireants/index.html.

3.2.8 Pest Management in Housing

Housing areas on the installation are under a PPV partnership with Balfour Beatty Communities. The PPV partner is responsible for providing pest management services and for upholding the agreements set forth in the Partner's Plan for Pest Control. General pest control and grounds maintenance services are provided by contract. Certificates for the PPV contract pesticide applicators are located in appendix D. Contractors providing services in the PPV areas must follow all state and local laws.

Pet dogs and cats released or lost by owners on base can become a pest problem. Feral cats and dogs are susceptible to and can carry disease, damage natural habitats, harm protected wild animals, become a vehicle strike hazard, and attack and injure personnel. Pet owners are encouraged to microchip their pets.

Microchipping is a permanent pet identification system using a computer chip implant in the skin of the animal. This allows a lost pet to be identified even if the collar tag is missing.

3.2.9 Self-Help Pest Management

Self-help pest control programs on DOD installations are authorized by DODI 4150.07 (section E4.7.7.3) when they are cost-effective and when IPM monitoring indicates the need for control. Self-help pest control allows uncertified personnel to use low-toxicity, ready-to-use (RTU) pesticides for small-scale pest control operations. Examples of self-help programs available are: stinging insect pest control for maintenance personnel, venomous spider control, fire ant control, vegetation control using glyphosate, and barracks/office pest control. Any personnel or departments conducting unauthorized pesticide applications should be directed to immediately cease applications. Requirements for self-help are:

1. The program shall be reviewed and approved by the IPM coordinator and then by the NAVFAC Atlantic PPMC

2. A program manager, who will be responsible for the program and be the primary point of contact, shall be designated

3. All personnel that will be applying pesticide must be trained and their training documented

4. Only RTU pesticides approved for use by the NAVFAC Atlantic PPMC shall be used

5. The area(s) to be treated should be small enough to be practically treated with RTU pesticides

6. All pesticides will be stored in a storage site as described on the pesticide label

7. All pesticide use will be reported.

To request review of a proposed program and submit a statement of need, the IPMC must contact the NAVFAC Atlantic PPMC.

3.2.10 Prohibited Operations and Devices

Several operations and devices are prohibited by DOD and DON regulations.

Prohibited operations and devices include:

1. Occupied spaces—Installations shall not permit liquid spray and dust pesticide formulations in any space occupied by unprotected personnel. However, pesticides contained in gel or paste bait formulation may be applied in occupied spaces (OPNAV M-5090.1, paragraph 24-3.2).

2. Preventive or Scheduled Pesticide Treatments—DOD policy prohibits the use of regularly scheduled, periodic pesticide applications except 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 (DODI 4150.07, section E4.10.3).

3. Electrically-Operated Devices—“Electromagnetic exclusion or control devices, ultrasonic repellent or control devices, and outdoor devices for electrocuting flying insects are not approved for use on DOD installations” (DODI 4150.07, section E4.10.1). This does not apply to indoor use of selected devices, carefully placed, for electrocuting flying insects. Pest surveillance traps

and monitoring equipment, such as non-electrocuting mosquito light traps, may also be used by trained personnel.

4. Paints and Coatings Containing Pesticides and Other Biocides—DOD policy prohibits the use of paint containing insecticides on DOD property. This includes interior and exterior paints. Paints containing fungicides as mildew inhibitors and approved marine antifouling compounds or coatings may be applied to protect surfaces of watercraft (DODI 4150.07, section E4.10.2).

3.3 REGULATORY COMPLIANCE

The Department of Defense's policy is to ensure that DOD pest management programs achieve, maintain, and monitor compliance with all applicable executive orders and applicable federal, state, and local statutory and regulatory requirements. When there is a conflict between federal and local regulations, the installation will comply with the more stringent of the two. This may occur with pesticides limited for use by the state, which are not necessarily restricted by the EPA. In this case, the installation must comply with state regulations.

3.3.1 Pesticide Regulation and Enforcement

The U.S. Environmental Protection Agency (EPA) has the primary authority to regulate pesticides in the United States. The EPA delegates pesticide enforcement authority to states through cooperative agreements. Per OPNAVINST 6250.4C, Navy installations must comply with state and local pesticide use regulations.

The responsibility for compliance and enforcement lies with the installation's commanding officer. As the installation CO's pest management advisor, the IPMC shall be familiar with federal, state, and local pesticide use regulations and ensure that all applicators conduct operations in compliance with these regulations. The environmental division should be familiar with these regulations as well due to the environmental hazards of pesticides. Regulatory enforcement for each of the PMSPs is provided.

1. Commercial contractor applicators: PMPARs shall provide assistance by monitoring contract PMSPs for compliance with all applicable regulations as specified in the contract and will recommend appropriate actions to the contracting officer if the contractor does not comply. Preventive medicine technicians conducting sanitation inspections of food service facility pest management programs can also ensure compliance for safe pesticide use and applicator licensing/certification. Inspection guidelines are found in NAVMED P-5010, chapters 1 and 8. The preventive medicine technicians will notify the IPMC of any potential pesticide application violations observed during the course of routine sanitation inspections.

2. DOD applicators: The pesticide applicator's immediate supervisor, with the assistance of the IPMC, shall also ensure that pesticide use is in compliance. Under the authority of DODI 4150.07 and DOD Directive 5134.01, and per DODM 4150.07, Volume 1, the DOD may deny, suspend, or revoke the certificate of any DOD employee who violates any provision of Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) or falsifies records under DODM 4150.07, Volume 1. In accordance with DODM 4150.07, Volume 1, the installation CO may initiate a formal review if FIFRA violations are suspected. Violations shall be reported through appropriate command channels to the NAVFAC Atlantic certifying authority for review. The certifying authority shall determine if further action is required. That action may include suspension of the applicator's certification.

Naval Facilities Engineering Command, Atlantic Applied Biology shall provide assistance to the installation IPMC with compliance and enforcement issues and clarification of regulations. The senior pest management consultant is the certifying official for DOD-certified pesticide applicators on the installation.

3.3.2 Pesticide Laws and Regulations

Primary pesticide regulations include:

1. Federal: U.S. Code of Federal Regulations (CFR) at 40 CFR Section E, 152-180: Pesticide Programs (http://www.access.gpo.gov/nara/cfr/waisidx_03/40cfrv21_03.html).

2. DOD and Navy: DODI 4150.07, DOD Pest Management Program; OPNAVINST 6250.4C, Navy Pest Management Programs; OPNAV M-5090.1, Environmental Readiness Program.

3. Mississippi: The Bureau of Plant Industry (Pesticide Program) within the Mississippi Department of Agriculture and Commerce regulates the pest control industry (https://www.mdac.ms.gov/bureaus-departments/plant-industry/pesticide-program/).

3.3.2.1 The Pesticide Label

The primary source of pesticide regulations for the pesticide applicator is found on the pesticide label in accordance with 40 CFR § 156. Mississippi may add supplementary labels which are regulations that must be complied with in the state. It is a violation of federal and/or state law to use a pesticide in a manner inconsistent with the label. Note, however, that the pesticide label does not provide specific information for each site where the pesticide may be applied. For example, the pesticide label may allow application of an herbicide to unimproved grounds, but if those grounds are within a ringed map turtle habitat, then pesticide use may be restricted under the Endangered Species Act. Pesticide applicators should be aware of environmentally sensitive areas before beginning any new pesticide application and should consult the installation's environmental division. For more on pesticide labels, see http://www.epa.gov/pesticides/label/.

Endangered Species Protection Bulletins set forth geographically-specific pesticide use limitations for the protection of endangered or threatened species and their designated critical habitat. If your pesticide label directs you to the EPA Bulletins Live Web site (http://epa.gov/espp/bulletins.htm), you are required to follow the pesticide use limitations found in the Bulletin for your county, pesticide active ingredient, and application month.

3.3.2.2 Other Regulations

Other applicable directives, laws, and regulations concerning pesticide applicators and pest management operations are listed and described in appendix E.

3.4 PESTICIDE MANAGEMENT

Chemical control of pests using pesticides can be an integral part of an IPM program. Proper management of pesticides will ensure a safe and cost-effective pest management program. Management of pesticides includes the proper selection of pesticides, pesticide approval, procurement, storage, mixing, use of pesticide application equipment, and clean-up. The pesticide label provides most of the information needed to manage pesticide use and must be affixed to the container at all times.

3.4.1 Pesticide Selection

The following criteria should be used when selecting a pesticide:

1. Determine the need for a pesticide. Is a chemical pesticide really needed? In some situations non-chemical control methods may be more effective or less costly and time-consuming in the long term. Will exclusion or habitat elimination take care of the problem?

2. Choose a pesticide with a low toxicity. Can the pest be sufficiently controlled with a pesticide that has a low toxicity to humans?

3. Choose pesticides and pesticide formulations with minimal environmental impact. Avoid using "Restricted Use" pesticides if possible. The environmental impact of pesticide spills is reduced when using a granular pesticide formulation rather than a liquid. Can attractant bait stations be used instead of broadcast application of a pesticide?

4. Choose pesticides that provide a long-term or sustainable solution. For example, contact insecticides applied to ant trails will only temporarily halt the infestation, and may cause the colony to bud and form new colonies, while baits can kill the entire colony including the queen.

3.4.2 Pesticide Procurement

Pesticides used by contractors are included in the cost of the contract and are procured through commercial sources. Pesticides used by DOD personnel may be purchased through the Federal Stock System. Contractors cannot purchase pesticides through the Federal Stock System. A list of pesticides approved by the DOD and found in the stock system can be found at http://www.afpmb.org/sites/default/files/pubs/standardlists/DOD_pesticides_list.pdf. These are not the only pesticides that may be used on the installation. Only pesticides listed on the installation's pesticide AUL (appendix C) may be purchased. All pesticide products and pest control services procured via government credit cards must also be pre-approved by the NAVFAC Atlantic PPMC according to DON eBusiness Operations Office Instruction (EBUSOPSOFFINST) 4200.1A, Department of Navy Policies and Procedures For the Operation and Management of the Government Commercial Purchase Card Program (chapter 6, paragraph 7). For information on requesting new pesticides to the installation pesticide AUL, see section 2.2, Pesticide Approval.

3.4.3 Pesticide Storage

Pesticide storage facilities, retail sales, and vehicles each have specific requirements in regards to pesticide storage.

3.4.3.1 Pesticide Storage Facilities

DODI 4150.07, section E4.5.1, states that pesticide storage facilities "shall comply with all applicable regulatory standards and shall, where feasible, be modified to meet the minimum standards for new pesticide storage facilities." The Department of Defense standards are described in AFPMB TG No. 17, Military Handbook, Design of Pest Management Facilities. The NAVFAC Atlantic PPMC should be consulted during the design phase of new pesticide storage facilities to ensure that the latest requirements are included.

At a minimum, all existing facilities shall meet the following standards:

1. An active ventilation system that provides a minimum of six air changes per hour
2. Backflow prevention on all water sources used for mixing/filling
3. No floor drains and a surrounding berm that provides containment of any pesticide spills
4. Warning signs
5. Surrounded by a climb-proof fence with access only through doors with locks.

The in-house pest control shop maintains a pesticide storage and mixing facility at Building 421. The BOS grounds maintenance contractor shares this facility. Other contractors are not permitted to store pesticides on the installation.

The natural resources manager for the Stennis WMA maintains a pesticide locker behind the natural resources office.

3.4.3.2 Retail Sale Pesticide Storage

Household, pet, and garden pesticides displayed and sold at the commissary and NEX shall be stored in their original, sealed containers.

3.4.3.3 Vehicles

Pest control vehicles must carry pesticide spill kits in accordance with OPNAVINST 6250.4C (paragraph 13d). Pesticides shall not be transported in the vehicle's passenger compartment and pesticide containers shall be secured to vehicles to prevent spillage.

3.4.4 Pesticide Mixing

In-house pest control and the grounds maintenance contractor (per contract specifications) are permitted to mix on the installation. All pesticide mixing conducted by other commercial contractors is done off-site. One other exception to this is soil treatment for termite prevention during building construction; the contractor must mix the termiticide on-site while the PMPAR or IPMC is there to witness. Pest control operators must mix pesticides in accordance with the pesticide label in appropriate areas that minimize the risk of safety and environmental hazards. Contracted pest control operators must also mix pesticides in accordance with the contract specifications. Persons mixing pesticides with water shall protect the water supply from back-siphoning of the pesticide mixture. They shall also ensure accurate measurement of concentrated pesticide to ensure proper application rate. Precautions must be taken to minimize the risk of a pesticide spill. See section 5.3.4 for pesticide spill prevention measures. Spill kits must be maintained on pest control vehicles and must be available at the mixing site.

3.4.5 Pesticide Application

All pesticides shall be applied in accordance with federal, state, and label directions. Application of pesticides should be timed to ensure contact with and maximum kill of the pest and to prevent use under adverse weather conditions that can cause drift of the chemical outside the target area. See section 4.2.2 for more information on timing and drift prevention

3.4.5.1 Service containers

Containers other than the original pesticide container that are used for transporting pesticides to the job site must have a copy of the label attached. Service containers used for the application of a pesticide must have the following information on a tag attached to the container: name of party responsible for the container, the identity of the chemical in the container, and the signal word of the chemical. Containers commonly used for food, drink, or household products shall not be used to hold pesticides.

3.4.5.2 Equipment

Only pest control equipment that is in good repair and safe to operate shall be used by PMSPs. The equipment should be in good condition, free from corrosion, clean, and free from leaks. The PMPAR shall inspect equipment used by contract applicators. Applicators shall also ensure that they use equipment suitable to ensure proper application of pesticides.

3.4.6 Pesticide Disposal

All pest control equipment shall be properly cleaned. Contract PMSPs are not allowed to dispose of excess pesticide, used containers, or residues on the installation per contract specifications; they must conduct all cleaning off-site. Spray tanks and pesticide containers must be triple-rinsed prior to storage or disposal. Disposal of pesticide spray tank rinse water should be performed by applying to a site listed on the pesticide label, used for future mixing of the same pesticide, or disposed of as hazardous waste. Rinse water shall not be allowed to enter storm drains.

3.4.6.1 Sprayer Clean-Outs

When cleaned, spray equipment will be triple rinsed in the field using 10 percent of the tank capacity divided into 3 doses. The rinse material will be sprayed on the application site in accordance with the pesticide label.

3.4.6.2 Empty Containers

OPNAV-M 5090.1 (paragraph 24-3.12) requires disposal of pesticide wastes be in accordance with 40 CFR § 262, EPA Regulations for Hazardous Waste Generators. The disposal of pesticides, their containers, and related wastes is strictly regulated. Empty liquid pesticide containers will be triple-rinsed with 10 percent of the container's capacity divided into 3 doses. Disposal of empty containers will be coordinated with the installation's environmental division. Empty containers will not be reused. If possible, pesticide containers shall be returned to the manufacturer for recycling.

3.4.6.3 Rinse Water

Water from rinsing out equipment will be used immediately. If it cannot be sprayed on the application site, rinse water should be stored in marked plastic containers and used as the diluent for the next time the same pesticide is formulated for application. Wastewater formulations that contain pesticides shall not be discharged into any storm or sanitary sewer system.

3.4.6.4 Excess Pesticides

Disposal or redistribution of excess pesticides shall be coordinated through Environmental and the IPMC. Environmental and the Consolidated Hazardous Material Reutilization and Inventory Management

Program (CHRIMP) will determine whether the pesticide can be redistributed or if it needs to be disposed of. Excess pesticides shall never be disposed in any storm or sanitary sewer system.

3.5 MINIMUM RISK PESTICIDES

Minimum risk pesticides, such as those marketed under the EcoEXEMPT brand, may be used by pest management service providers (PMSP) as part of their IPM program. According to the EPA, "Minimum risk pesticides are a special class of pesticides that are not subject to federal registration requirements because their ingredients, both active and inert, are demonstrably safe for the intended use." These pesticides are exempt from federal registration under section 25(b) of the FIFRA and are not labeled with an EPA registration number. Since there is no federal review of these pesticides or their pesticide label, there is no federal review of the instructions for effective use of these products. Although these pesticides are exempt from federal registration, they still need to be approved prior to use on DOD property, primarily for efficacy and safety reasons.

3.6 CANCELED PESTICIDES

The EPA has canceled or restricted several common pesticides.

3.6.1 Organophosphates

Chlorpyrifos (e.g., Dursban, Lorsban) and diazinon were, widely used pesticides that have been canceled. The following actions are allowed with these pesticides:

1. End users (e.g., PMSPs and private, residential users) should check with NAVFAC Applied Biology or state/local regulatory agencies for guidance. Some canceled pesticides are allowed to be used until stocks are depleted, while others are under a stop use order.

2. PMPARs should monitor the use of the pesticides by contractors to ensure that they are not using an increased amount of the pesticides as a means of using up their stock.

Fenamiphos (e.g., Nemacur), a systemic insecticide/nematicide commonly used for the control of turf nematodes, was canceled by the EPA on May 31, 2008 with an end use date on October 6, 2017. Use any remaining stocks in accordance with the label until the end use date.

3.6.2 Organic Arsenicals

The EPA is also canceling most organic arsenical pesticide registrations, which consist of monosodium methanearsonate (MSMA), disodium methanearsonate (DSMA), calcium acid methanearsonate (CAMA), and cacodylic acid and its sodium salt. All uses of DSMA, CAMA, and cacodylic acid and its sodium salt were canceled as of September 30, 2009.

All uses of MSMA except cotton, sod farms, golf courses, and highway rights-of-way, were canceled as of September 30, 2009. Use of MSMA on sod farms, golf courses, and highway rights-of-way was to have been prohibited after December 31, 2013, but because the EPA is considering newly-submitted information, these uses remain registered. These uses, in addition to the cotton use, will be considered in the pending registration review process for MSMA. Users can continue to apply MSMA on sod farms, golf courses, and highway rights-of-way until further notice, but thoughtful use and consideration of depleting stocks is highly encouraged. For golf courses and highway right-of-ways, the following restrictions currently apply:

1. For golf courses:

    a. Spot treatments only (100 square feet per spot), not to exceed 25 percent of the total golf course acreage per year

    b. One broadcast treatment for newly constructed courses only.

2. For highway right-of-way:

    a. Two broadcast applications only on highway rights-of-way

    b. A 100-foot buffer around permanent water bodies.

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CHAPTER 4

Health and Safety

4.1 PESTICIDE APPLICATOR SAFETY

To ensure the safe use of pesticides, pesticide applicators shall handle and apply pesticides in accordance with the product's label directions.

4.1.1 Potential Occupational Hazards

The following hazards may be encountered by pesticide applicators or Government representatives that may be exposed while inspecting pest management operations. Occupational safety and health guidance is found in the OPNAVINST 5100.23G, The Navy Occupational Safety and Health Program Manual.

4.1.1.1 Direct Contact Toxic Chemical Exposure

Many chemicals used as pesticides are also harmful to humans. The three routes of exposure to applicators are dermal, inhalation and ingestion. For applicators, the most common route of exposure is dermal and is frequently due to not wearing the appropriate personal protective equipment. Severity of the harmful effects is determined by duration of exposure and toxicity of the chemical. The effects can be acute (rapid onset due to high-dosage, high-toxicity chemicals) or chronic (slow or delayed onset due to long-term exposure to low-dosage, low-toxicity chemicals). The highest risk for severe acute chemical exposure occurs during pouring and mixing of concentrated pesticide resulting in high-dose, rapid-onset chemical poisoning. Chronic exposure can occur when the applicator fails to use appropriate PPE during frequent pesticide applications and the chemical accumulates in the body of the individual over a period of time leading to delayed or gradual onset of illness or injury. Direct chemical exposure can result not only in pesticide poisoning, but also in skin burns due to corrosive chemicals.

4.1.1.2 Heat

The use of protective equipment such as a respirator, goggles, gloves, and coveralls increases the risk of heat injury especially in warm climates. Heat injury can occur during long periods of work outdoors during warm weather or in enclosed spaces where machinery or equipment may generate heat.

4.1.1.3 Noise

Some pesticide application equipment use gas-powered air compressors or pumps that produce noise hazards. Gas-powered backpack sprayers are particularly hazardous due to the proximity of the noise source to the ears.

4.1.1.4 Eye Hazards

Eye hazards may result from chemical splashed into the eyes causing corrosive, toxic, or impact injury. Some pesticides are labeled "Restricted Use" due to their corrosive nature. The highest risk occurs during pesticide pouring, mixing, and application. During pesticide applications, chemicals may enter the eyes

through splash back when applying the chemical under pressure into a crack or crevice or when applying pesticides overhead. Injury may also occur during equipment cleaning.

4.1.1.5 Infectious Zoonotic Disease

Care should be taken when trapping and handling live or dead animals. Hantavirus may be transmitted from rodents to humans through body fluid exposure or when breathing aerosolized rodent excreta. Pest management providers may be exposed when handling rodent carcasses after trapping or handling traps contaminated with rodent urine and feces. Feral dogs, cats, skunks, raccoons, and bats may carry and transmit rabies through a bite.

4.1.1.6 Inhalation Hazards

Many pesticides release hazardous vapors and are particularly hazardous in enclosed spaces. Some pesticides are labeled “Restricted Use” due to the high risk of inhalation injury. Personnel may be exposed during mixing, application, and equipment cleaning.

4.1.1.7 Electrical and Fire Hazards

Spot and crack and crevice applications may require application of a pesticide to areas near motors of refrigerators, compressors, and other machinery where it can become an electrical shock hazard. They may also be applied to areas near pilot lights resulting in an explosion and/or fire hazard.

4.1.1.8 Head Impact and Sharp Hazards

Surveys and pest control procedures may be done in attics, crawl spaces, basements, and other areas with low overheads where head impact hazards exist. Some devices used for bird roosting exclusion and rodent control have sharp edges and can cause cuts, puncture wounds, and abrasions.

4.1.1.9 Trip and Fall Hazards

Trip hazards may occur when applicators are spraying without close attention to where they are stepping. Spraying around buildings where there are various obstacles (e.g., plants, utility boxes, plumbing) in the path of the applicator can be particularly hazardous. Pest control may also need to be performed from ladders, on roofs, in ceilings, and in trees. Wet surfaces on the ground or on elevated surfaces can increase the risk of trips and falls.

4.1.1.10 Exposure to Harmful Animals

Venomous animals such as bees, wasps, rattlesnakes, and spiders are potential hazards when attempting to control them. Some of these are very dangerous due to envenomation and allergic reactions. Feral dogs, cats, coyotes, raccoons, and other large pest animals can inflict serious bites or clawing wounds.

4.1.2 Hazard Abatement

Detecting and reporting unsafe or unhealthful working conditions as early as possible, and then promptly controlling the reported hazards, is essential to a successful safety and occupational health program.

4.1.2.1 Operational Risk Management

Operational risk management (ORM) is a decision-making tool to reduce the risk of mishaps, whether in military contingency or support operations Pest management operations pose risks to human health and

the environment that affect the installation's mission that can be reduced and minimized through ORM. Pest management ORM uses the following process to minimize hazards:

1. Identify hazards—the hazards may involve the pesticide or the application equipment (see list of hazards in section 4.1.1).

2. Assess hazards—determine the degree of risk based on the probability and severity of these hazards. For example, the risk may be high if a highly-toxic pesticide is used daily.

3. Make risk decisions—develop risk control options. Decide whether benefits of control outweigh the risks involved.

4. Implement controls

    a. Engineering controls—e.g., use a less-toxic pesticide for controlling the pest

    b. Administrative controls—e.g., place warning placards around pesticide vehicles and pesticide storage areas.

    c. Personal protective equipment—e.g., wear a respirator when an inhalation hazard exists.

5. Supervise—follow-up to determine effectiveness of controls and monitor changes to hazards.

For more information on ORM, go to the Navy Safety Web site at http://www.safetycenter.navy.mil/.

4.1.2.2 Training and Education

Pesticide safety is a core requirement for DOD and civilian pesticide applicator certification and licensing programs. Topics included in the DOD training are listed in DODM 4150.07, Volume 1, The DOD Plan for the Certification of Pesticide Applicators. Safety topics are also given during recertification courses. See section 2.4 for specific training information.

4.1.2.3 Read the Pesticide Label

Pesticide labels are found on all pesticide containers used by installation PMSPs. The pesticide label provides directions for mixing, applying, and disposing of pesticides safely. It also includes a list of hazards to humans and first aid treatment. It may also include a list of personal protective equipment that must be worn and user safety recommendations. The label should always be read completely and thoroughly by the applicator before purchasing and using a pesticide. The label is a legal document mandated by FIFRA.

4.1.2.4 Personal Protective Equipment

Personal protective equipment (PPE) should always be used when applying pesticides. The type and level of protection needed will be determined by the toxicity, formulation, and method of application of the pesticide. The pesticide label provides guidance on what PPE to use.

1. Respirator

2. Chemical-resistant gloves

3. Chemical-resistant coveralls or long-sleeve shirt and long pants

4. Chemical-resistant boots
5. Hard hat
6. Goggles
7. Apron
8. Face shield
9. Self-contained breathing apparatus (for fumigation).

Personal protective equipment must be appropriate for the type and application of the pesticide being used. It is the applicator's responsibility to maintain the PPE. Contractors must provide appropriate PPE to their applicators.

4.1.2.5. Pest Control Vehicle Safety Devices

Pest control vehicles should be equipped with safety devices and information.

1. Labels and SDSs for all pesticides in vehicle
2. Emergency medical information including nearest emergency treatment center
3. Fire extinguisher
4. Spill kit
5. First aid kit
6. Cell phone or radio
7. Drinking water supply
8. Rinse water supply for washing pesticide off skin.

4.1.2.6 Pesticides and Equipment

The risk of pesticide exposure can be reduced by selecting the appropriate pesticide and equipment for the job. Applying small amounts of low-toxicity pesticide using appropriate and properly-maintained equipment greatly reduces the risk of harm. Using pesticides that are formulated (e.g., contain emetics) or packaged (e.g., water-soluble packets) to minimize chemical exposure and increase safety should be considered when purchasing pesticides. Pesticide selection is addressed in section 3.4.1. Equipment should be tested with water prior to use to ensure proper application and that it is not leaking. Situational awareness, such as monitoring meteorological conditions and location, may also prevent harmful exposure to pesticides.

4.1.2.7 Protection from Infectious Zoonotic Diseases

Pest control personnel who handle trapped animals or dead animal carcasses should wear gloves to prevent exposure to potentially infectious body fluids. A respirator fitted with a high-efficiency

particulate air filter should be worn when entering enclosed spaces with large amounts of rodent feces that might be disturbed and become airborne. Additional protection from hantavirus can be provided by spraying dead rodents and rodent feces with a commercial disinfectant. This will kill hantavirus as well as wet the feces to prevent it from becoming airborne. Detailed guidance on rodent handling is found in AFPMB TG No. 41, Protection from Rodent-borne Diseases with Special Emphasis on Occupational Exposure to Hantavirus.

4.1.2.8 Hazard Communication

All pesticide applicators must receive Occupational Safety and Health Administration (OSHA) Hazard Communication training (29 CFR § 1910.1200). Contractors must carry safety data sheets (SDSs) in their vehicles or, as appropriate, at their on-base administration office. Applicators must understand all of the hazards associated with the chemicals they will use and be able to communicate those to the customer if necessary.

4.1.2.9 Medical Surveillance Program

Department of Defense pesticide applicators are required to be in a medical surveillance program depending on their hazard exposure. Medical surveillance is conducted by the occupational health clinic at the Naval Branch Health Clinic in accordance with Navy Environmental Health Center Technical Manual (NEHC-TM-OEM) 6260.96-2, Occupational and Environmental Medicine Field Operations Manual.

4.2 PUBLIC SAFETY

By their nature, many pesticides may pose some risk to humans, animals, or the environment because they are designed to kill or otherwise adversely affect living organisms. Safely using pesticides depends on using the appropriate pesticide and using it correctly.

4.2.1 Potential Hazards to the Public

A potential hazard is the risk of harmful effects from pesticides and the level of risk depends on the toxicity of the pesticide and the exposure a human will receive in any situation.

4.2.1.1 Direct Contact with Pesticides

Pesticide exposure can occur through dermal contact with a pesticide on a surface, inhalation of vapors, or ingestion of pesticide through contaminated food or eating utensils. This type of exposure can occur if a pesticide application is done while unprotected building occupants are present, occupants are allowed entry into buildings before the pesticide has dried, or food and food preparation and serving equipment are not properly protected or cleaned after an application.

4.2.1.2 Pesticide Drift

Pesticide drift occurs when a pesticide leaves the target area and affects unprotected persons outside the area. This commonly occurs outdoors when winds can carry the pesticide off-site. Drift can occur indoors if there is air movement or pesticides are drawn up through ventilation ducts. Pesticide applications that involve small pesticide droplets, such as fogging or ultra-low volume application, or dusts are most susceptible to drift.

4.2.1.3 Contact with Contaminated Water

Some pesticides can move through soil and contaminate groundwater used for drinking. Others, if applied in or close to surface water, can cause contamination of recreational waterways.

4.2.1.4 Injury Due to Animals or Plants

The use of an inappropriate pesticide may cause collateral injury due to an insufficient knockdown of the target pest. This can occur with bees and wasps. Some insecticides do not knockdown the insects rapidly and may actually excite them causing them to become more aggressively defensive in behavior. Unprotected persons blocks away from the pesticide application may become the target of their aggression. Injury can also occur when persons get too close to or try to release a trapped animal or try to capture feral animals by themselves.

4.2.1.5 Fumigation Exposure

Fumigants are highly toxic and can cause immediate death upon exposure. Fumigations can be performed in the housing area where it poses a potential hazard to neighbors and pets. During fumigation the chemical is injected into a tarped structure and allowed to remain for 24 hours. The highest risk of injury or death occurs if a person or animal were to enter the tarp during this period or after the tarp is removed, but before the building is completely ventilated. The fumigant, when exposed to air, dissipates rapidly and readily.

4.2.2 Hazard Abatement

Pesticide applicators should continually be aware of the hazards associated with pesticide use in order to protect the public from exposure.

4.2.2.1 Proper Timing of Pest Control Operations

Most indoor application of pesticides should be conducted when building occupants are not present. An exception to this is the application of pesticide baits that are enclosed in a tamper-proof bait station that does not allow exposure to occupants or pets. The building occupants must remain out of the building to allow the liquid pesticide to dry. Some pesticide labels are specific about re-entry times (time after application that occupants are allowed back into the treated building). Some pesticides, such as fumigants, provide specific directions on aeration of spaces to remove pesticide prior to re-entry. Certain operations, such as bee and wasp control or removal, are best conducted after the area has been cleared of unprotected persons. Refer to the product label for specific information.

4.2.2.2 Preventing Pesticide Drift

Pesticide drift from target areas to areas where humans, animals, and plants can be affected can be reduced through the following means (adapted from University of Nebraska publication G1773, Spray Drift of Pesticides).

1. Select low or nonvolatile pesticides.

2. Read and follow the pesticide label. Apply a pesticide only if an application is warranted.

3. Use spray additives that decrease drift within label guidelines. This will increase the droplet sizes and pesticide effectiveness.

4. Use larger spray nozzle orifice sizes. This will give larger droplets and will increase the number of tank refills, but will improve coverage and effectiveness.

5. Avoid high pressure. High pressure creates finer droplets; 45 PSI should be considered maximum for conventional broadcast spraying.

6. Use drift-reduction nozzles. These will produce larger droplets when operated at low pressures.

7. Use wide angle nozzles and low boom heights, and keep the boom stable.

8. Drift is minimal when wind velocity is less than 10 mph. Do not spray when wind is greater or blowing towards sensitive crops, gardens, dwellings, livestock, or water sources.

9. Use shielded spray booms. When banding, use shroud covers to keep chemical from drifting.

10. For indoor applications, turn off ventilation and close doors to prevent air currents.

4.2.2.3 Prevent Tampering with Animal Traps

Caged animals can be very aggressive. Traps should be placed in areas where they will not be tampered with by humans or pets. Warning signs can be placed on the traps and area occupants can be warned of the risk of injury. Live and dead rodents in traps can also be a hazard for hantavirus. Traps should be placed in areas where humans or domestic animals will not be exposed to the rodents.

4.2.2.4 Protection of Fumigation Sites

Warning signs should be posted at the fumigation site warning of the hazards. Some installation contracts require the contractor to provide a 24-hour roving watchperson to patrol the fumigation site to prevent entry by unauthorized personnel.

4.2.3 Special Safety Considerations

Certain areas require special considerations due to the sensitive nature of the area or the people contained in that area.

4.2.3.1 Child Development Center

Children can be sensitive to pesticides and other chemicals. Parents are also concerned about potential hazards that their children may be exposed to and have a right to know about these hazards. Best practice is to minimize pesticide use in and around child development centers and schools, use only enclosed baits and low-toxicity pesticides, do not apply pesticides when people are present, and inform staff and parents of any pesticides used on the property. Integrated pest management methods should be used to reduce the health risks of pesticides to children.

4.2.3.2 Branch Clinic

Persons undergoing medical treatment may be highly sensitive to pesticides and pesticide odors in the environment. Additionally, medical equipment and supplies may be contaminated during pesticide applications. Alternative IPM methods must be considered prior to using pesticides in medical treatment areas. If pesticides must be used, then only crack and crevice treatments with low toxicity pesticides or enclosed baits can be used. Application of any liquid or dust formulation must only be done when the area

is unoccupied. Guidance for pest management operations in medical treatment facilities can be found in AFPMB TG No. 20, Pest Management Operations in Medical Treatment Facilities.

4.2.3.3. Food Service Areas

Food contaminated with pesticides can lead to pesticide poisoning. Sanitation and exclusion should be the primary means of preventing and reducing pest infestations. Pesticide use in food service areas should be limited to low-toxicity pesticides, applied to cracks and crevices, and baits. The area should be properly prepared for treatment by putting away utensils and equipment and covering food preparation services. After treatment, the area should be thoroughly cleaned to prevent contamination.

4.3 PEST CONTROL ACCIDENTS

In the case of a pest control accidents, applicators should be trained in first aid procedures and identify the nearest medical services.

4.3.1 First Aid

First aid for pesticide accidents is included on the pesticide label. The applicator should be familiar with first aid procedures required for the pesticide they are using. A copy of the label must be available at the application site. For some pesticides, immediate first aid and medical treatment may be required.

4.3.2 Medical Emergencies

Pesticide applicators experiencing an acute exposure to hazardous pesticides or significant injuries sustained in control operations should immediately go to the nearest emergency room capable of treating their emergent condition. Pesticide applicators that are government employees enrolled in a medical surveillance program with the occupational health department should schedule a follow-up appointment after their condition has subsided. The name, address, and telephone number of an emergency medical care facility should be posted in the commercial applicator's vehicle. For pesticide poisonings, a copy of the pesticide label should be given to the medical first responders or taken to the emergency medical facility. If cholinesterase-inhibiting pesticides (e.g., malathion) are used, the proper antidotes include atropine and 2-pam chloride.

CHAPTER 5

Environmental Considerations

5.1 ENVIRONMENTAL MANAGEMENT SYSTEM FOR PESTICIDES

This IPMP puts pesticide management within the framework of the DOD and the Navy Environmental Management System (EMS). This plan provides the tools and products to include pesticide management in the installation's overall EMS program.

5.1.1 Department of Defense Policy

Department of Defense policy states, "The Department of Defense shall integrate EMS into missions, activities, functions, contracts, and installation support agreements as a business practice for improving overall performance. EMS is a vital supporting component of the DOD mission and is therefore the responsibility of all DOD personnel. It is not just an environmental function responsibility, but requires active participation from all functions and organizations." The remainder of this policy and details on the EMS program are found in DODI 4715.17, Environmental Management Systems.

5.1.2 Definition of an Environmental Management System

According to the Council on Environmental Quality, Instructions for Implementing Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management, March 29, 2007, "Environmental Management System means a set of processes and practices that enable an organization to increase its operating efficiency, continually improve overall environmental performance and better manage and reduce its environmental impacts, including those environmental aspects related to energy and transportation functions. EMS implementation reflects accepted quality management principles based on the "Plan, Do, Check, Act," model found in the ISO 14001:2004(E) International Standard and using a standard process to identify and prioritize current activities, establish goals, implement plans to meet the goals, evaluate progress, and make improvements to ensure continual improvement."

5.1.3 Conformance of the Pest Management Program to the Environmental Management System

An EMS is composed of five basic components. The components and how the pest management program conforms to these components are:

5.1.3.1 Policy

The installation has established an environmental policy to support "mission readiness through environmental stewardship." Pest management environmental objectives to meet this policy are:

1. Reduce pesticide pollution that affects the installation's neighbors through the use of IPM to prevent adverse impact on air, water, and land resources

2. Use IPM to preserve aspects of the natural environment by managing and controlling invasive and nuisance pests and preventing pesticide pollution

3. Ensure and maintain the competence of pest management personnel through certification and training to ensure that effective operations and technologies are used to control pests that minimize waste, prevent air and water pollution, minimize health and safety risks, and dispose of waste safely and responsibly

4. Enable the IPMC to maintain effective oversight and coordination of the program and liaison with local agencies in order to ensure regulatory compliance.

5.1.3.2 Planning

This IPMP is the installation's primary planning document. Specific planning items included in the IPMP are:

1. Legal and other requirements as identified in section 3.3, appendix E, and throughout the plan.

2. General objectives and targets as included in section 1.3.2 and specific pest management objectives included in the IPM sheets in chapter 8.

5.1.3.3 Implementation

Implementation of the EMS is addressed in the following sections of the IPMP:

1. Roles and responsibilities—section 2.1.

2. Pest management personnel training and awareness—section 2.4.

3. Program documentation includes record keeping, reporting, and IPMP updates—sections 2.3 and 1.1.4.

4. Operational requirements—section 1.3.3. Operational control is the responsibility of the pest management service providers and is maintained through their contract. Integrated pest management is the operation used for reducing environmental impacts and supporting mission priorities.

5. Safety considerations—chapter 4.

5.1.3.4 Checking and Corrective Action

The success of an EMS depends on the ability of an installation to assess and correct itself. The self-assessment checklist (appendix B) provides the basis for a self-assessing and self-correcting system.

5.1.3.5 Management Review

The review of the program is conducted during environmental audits by Commander, Navy Installations Command (CNIC).

5.1.3.6 Emergency Management System Definitions

The following are common terms used in EMS:

1. Practice—any activity conducted by an installation or its tenants in performing their missions that has an actual or potential impact on the installation's assets. The term practice includes equipment, processes, and facilities. It includes both business and management practices.

2. Practice owner—the person, unit, or organization that operates, conducts, controls, or is otherwise responsible for a practice.

3. Environmental aspects—elements of an organization's activities, products, or services which can interact with the environment.

4. Impact—the positive or negative effects on assets of conducting business and management practices.

5. Vulnerable assets—A resource on which the installation depends or for which it has some responsibility, and which may be impacted by the conduct of practices. Vulnerable assets may include environmental, historical, and cultural areas on and off the installation; personnel health and safety; mission effectiveness; military training lands; real property; financial resources; and public relations status.

5.2 ENVIRONMENTAL CONSIDERATIONS ON THE PESTICIDE LABEL

If the pesticide is potentially harmful to the environment, information will be provided in the following sections of the label:

1. Directions for Use—If pesticide drift is a potential environmental hazard, the directions may require certain application equipment and/or the addition of an anti-drift agent to the tank mix.

2. Environmental Hazards—This section may indicate the pesticide is particularly hazardous to specific animals (e.g., bees, fish). It will also provide information on how to avoid environmental damage.

5.3 MANAGING ENVIRONMENTAL IMPACT

Air, water, and soil risk contamination from pesticides. Pesticide drift to outside the target application area is the primary reason for contamination. Pesticides that pose the highest risk of contamination are herbicides applied to improved and unimproved grounds. Despite being applied in water, pesticides to control mosquito larvae pose a minimal risk due to the target-specific nature of the pesticide (e.g., the biopesticide, *Bacillus thuringiensis israelensis* (Bti), and insect growth regulators). Many procedures to reduce the impact of pest management practices on vulnerable assets are already in place.

5.3.1 Pesticide Pollution

5.3.1.1 Synthetic Pyrethroids

Pyrethroids are insecticides that are widely used for household, garden, and agricultural pest control. Most were replacements for more toxic and environmentally-hazardous organophosphate and carbamate insecticides. Surveys have indicated that some pyrethroids are being detected in urban stream sediment and at least one chemical has been shown to be toxic to sediment dwelling organisms. Specific pyrethroids of concern include:

1. Bifenthrin (i.e., Talstar)

2. Cyfluthrin (i.e., Cykick, Tempo)

3. Beta-Cyfluthrin (i.e., Tempo Ultra)

4. Cypermethrin (i.e., Demon, Cynoff)

5. Deltamethrin (i.e., Deltadust)

6. Lambda-Cyhalothrin (i.e., Demand)

7. Permethrin (i.e., Permanone)

8. Tralomethrin

Outdoor operations pose the greatest risk for pyrethroid contamination of surface water and stormwater runoff. Increased risk operations that may use pyrethroids include landscape plant insect control, agricultural insect control, and uniform repellent treatment.

5.3.1.2 Pollinator Protection from Pesticides

Pollinators, such as bees, bats, birds, and butterflies, are essential to the majority of the flowering plants in the environment and to the production of more than 130 different food crops. Protection of both managed bee colonies that are used in the agricultural outleases and feral bees must be considered in pest management operations. Pollinators are highly sensitive to many pesticides, especially insecticides. Best management practices to protect pollinators include:

1. Read the pesticide label for any precautions for bees and apply the product in a manner consistent with the label directions.

2. Use less hazardous insecticides. Certain classes of insecticides are highly toxic to bees. These are organophosphates, carbamates, and neonicotinoids (i.e., imidacloprid).

3. Choose the least hazardous insecticide formulation if possible. Granules are the least hazardous. Dusts are the most hazardous because they are similar in size to pollen, stick readily to the hairs on the insect, and can be carried back to the nest.

4. Use insecticides with short residuals. The label will include a residual toxicity (RT) time that is the time after application until there is minimal toxic effect on bees.

5. Avoid applying any bee-toxic pesticides on blooming plants that attract bees.

6. Do not apply insecticides when temperatures are forecast to be unusually low or when the evening forecast is for dew. These conditions extend the period in which the insecticide residue remains toxic.

7. Apply pesticides that are toxic to bees at night when most honeybees have stopped foraging and returned to their hives.

8. Use ground applications instead of aerial applications to reduce pesticide drift out of the target area.

Efforts should be made to conserve bee colonies. If the situation allows, bee swarms and hives should be removed and relocated rather than destroyed. For more on protecting bees and other pollinators from pesticides go to the EPA Pollinator Protection Web site: http://www2.epa.gov/pollinator-protection.

5.3.1.3 Pollution Prevention

The following pollution prevention best practices should be used on the installation:

1. Determine the need for pesticide use by conducting surveillance.

2. Apply pesticides and clean equipment away from storm drains to prevent storm water contamination.

3. Do not pour pesticide container rinsate into drains. Apply rinsate to a site listed on the pesticide label, store rinsate to use for future pesticide mixing, or dispose of according to local regulations.

4. Use less-toxic and target-specific pesticides.

5. When applying permethrin repellent to uniforms outdoors, do not mix or apply near storm drains or where water run-off will result in storm water contamination, avoid overspray of pesticide onto the ground, and apply spray tank rinsate to uniforms.

6. Minimize outdoor applications of pyrethroid pesticides.

7. Use targeted spot spraying or crack and crevice applications rather than broadcast or baseboard spraying.

8. Minimize pesticide storage on the installation through proper inventory management and by not allowing contractors to store pesticides on the installation.

9. Use rodent traps rather than rodenticides.

5.3.2 Natural Resources Protection

Natural resources on the installation have the potential to be impacted by pest management operations or have an impact on these operations. These pest management operations include, but are not limited to, surveys, trapping, weeding, biological control, and pesticide use. The installation's Integrated Natural Resources Management Plan (INRMP) provides detailed information on the natural resources found on the installation. The INRMP also lists management objectives and recommendations to protect and enhance the installation's natural resources programs.

5.3.2.1 Environmentally-Sensitive Areas

Sensitive habitats are declared in the installation INRMP. The IPMC is responsible for knowing the boundaries and restrictions of sensitive habitat(s) on their respective site and communicating this information to any pest control or grounds contractors via the PMPAR. Although the IPMC should have a general knowledge of these areas, any proposed application of pesticides in any of these areas must first be coordinated and approved by the natural resources manager. Applications of pesticides to wetlands or other environmentally sensitive sites, such as tidal marshes and beaches, or around these areas should be carefully planned. Strict adherence to both the pesticide label and the clearances described in the INRMP are required.

5.3.2.3 Invasive Species Prevention

Invasive species can cause damage to native habitats and introduce diseases to native plants and animals. All military vehicles and materials that have been in contact with foreign soil and returning from foreign locations including Hawaii are required to be cleaned by the deployed unit and inspected by the U.S. Department of Agriculture Plant Pest Quarantine Officers prior to disembarkation onto U.S. soil per SECNAVINST 6210.2A, Quarantine Regulations of the Armed Forces. The purpose of these inspections is to prevent the introduction of disease causing organisms and plant pests. Although the inspections are generally thorough, the equipment of recently redeployed units should be monitored to ensure that any introduced pests are destroyed properly. Any pests found on this equipment should be reported to the environmental division.

5.3.2.4 Threatened and Endangered Species

Section 7(a) of the Endangered Species Act (ESA) (16 U.S.C. § 1536(a)-(d)), as amended, requires federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat. Regulations governing this interagency cooperation are included in 50 C.F.R. § 402.

A comprehensive list of endangered and threatened species is listed on the U.S. Fish and Wildlife Service (USFWS) Web site. Listed species habitats are also protected as critical habitat under the ESA. Critical habitat information can be found through species information found at the USFWS Web site.

Most species of mammals (including bats, raccoons, and skunks) and all but a few birds are protected by state or federal law. Federally-protected species, their nests, or their eggs may not be taken without obtaining permits from the U.S. Fish and Wildlife Service. Control of state-protected species may require permits from the state. All attempts shall be made to solve the problem through habitat alteration, exclusion, fright techniques, or similar approaches before lethal control is attempted.

State and federally threatened and endangered species known to occur in the vicinity of Stennis WMA are outlined in the INRMP. Federally threatened and endangered species in Mississippi are outlined on the USFWS Web site: http://www.fws.gov/mississippiES/endsp.html. The Mississippi Museum of Natural Science's Mississippi Natural Heritage Program (http://www.mdwfp.com/seek-study/heritage-program.aspx) maintains lists of species of special concern for each county in the state, protected by Mississippi law.

5.3.3 National Pollutant Discharge Elimination System

Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The permit is available to operators who discharge to waters of the United States from the application of either biological pesticides or chemical pesticides that leave a residue when application is for one of four use patterns:

1. Mosquito and other flying insect control
2. Aquatic weed control
3. Aquatic nuisance animal control

4. Forest canopy pest control.

If pesticide applications for the above use patterns are expected to exceed thresholds, a Notice of Intent (NOI) and preparation of a Pesticide Discharge Management Plan (PDMP) (PDMP template included in appendix F) may be required. Practicing integrated pest management, recordkeeping, and monitoring are also requirements under the NPDES permits.

The State of Mississippi Pesticide General Permit for Point Source Discharges to State Waters of Mississippi from the Application of Pesticides is included on the CD of supporting documents included with this plan. The Mississippi Department of Environmental Quality, Environmental Permits Division implements and oversees the permit program: http://deq.state.ms.us/.

5.3.4 Spill Prevention and Management

Installation spill prevention guidelines shall be followed. The following spill prevention actions shall be taken:

1. Spill kits shall be readily accessible in all pest management vehicles, mixing sites, and pesticide storage facilities.

2. Pesticides shall only be stored in an area with containment to hold a spill and without a floor drain.

3. Portable mixing pads shall be used when appropriate.

4. All pesticide applicators shall be familiar with the installation spill contingency plan, if available.

All pesticide applicators are trained on spill response procedures as part of their initial pest management certification/licensing training. Spills will be managed as described in the installation spill contingency plan. Further information on preventing and controlling pesticide spills is contained in the AFPMB TG No. 15: Pesticide Spill Prevention and Management.

5.3.5 Hazardous Materials and Hazardous Waste Management

Pesticides, being hazardous materials, shall be managed in accordance with the installation's Hazardous Material Management Plan. Proper inventory management and planning will prevent waste generation. The appropriate use of pesticides produces very little hazardous waste. Rinse water containing pesticide residues usually has very small quantities of chemical and is often applied to the target pest site. Not permitting contractor storage of pesticides and on-site disposal of pesticide waste eliminates the need for hazardous material and waste management. In general, pesticides that are not applied must be disposed of as hazardous waste. Large quantities of hazardous waste may be produced when a pesticide is not used by its expiration date. It may also be produced if a pesticide is not used up before the registration for that pesticide is canceled and the stop-use date has occurred. These pesticides may be disposed of as universal waste only when allowed by the standards for universal waste management found in 40 CFR § 273. Any excess pesticides or absorbent material used for spill clean-up requiring disposal requires evaluation by the hazardous waste coordinator in the environmental division to ensure proper disposition.

5.4 Public Perception

The misuse of pesticides that lead to animal or human injury can lead to negative publicity for the installation. This is also the case with accidental pesticide spills, especially if they occur off-base or cause contamination of a local natural or cultural resource.

CHAPTER 6

Emergency Pest Management

6.1 PUBLIC HEALTH EMERGENCIES

Pests create a public health emergency when the pests increase in number and/or are found to carry human disease pathogens. A public health emergency, or potential emergency, requiring pest management action may be indicated in several ways. See the Emergency Vector Surveillance and Control Plan for more information (appendix G).

6.1.1 Natural or Manmade Disaster

Usually pest problems do not develop immediately after a disaster, such as earthquakes, wildfires, floods, vehicle accidents and terrorist attacks. Public health pest problems may be the result of increased amounts of refuse, collapse of local infrastructure (e.g., lack of garbage pick-up), decay of human and animal bodies, and accumulation of standing water. The potential pest-related consequences are vector-borne or zoonotic disease outbreaks and increased contact with rodents and feral animals that may cause injury.

6.1.2 Vector-Borne or Zoonotic Disease

The report of human cases of vector-borne or zoonotic disease or the detection of infected mosquitoes or sentinel animals is an indicator of a public health emergency or potential emergency and often warrants an increase in pest management activities.

1. Reports of human cases—Many human cases of vector-borne and zoonotic disease identified in local medical facilities are reportable to the local and/or state health agencies. A report of a human case of West Nile virus or other vector-borne disease may initiate an investigation and result in alerts going out to other hospitals and clinics if it appears that the case was locally acquired. Immediate vector control may be necessary to prevent further transmission.

2. Detection of infected mosquitoes or sentinel animals—Routine surveillance for mosquito-borne diseases are conducted by local and State health agencies. These agencies report testing results through the public health system. This surveillance program is an early warning system that indicates when vector control should be initiated or increased to prevent human disease. The CDC's ArboNET Maps, http://diseasemaps.usgs.gov/mapviewer/ provide mosquito-borne disease information by state.

6.1.3 Animal Attack

Attacks on humans by vertebrate animals almost always require an emergency medical response. If a person is bitten or scratched by a mammal such as a dog, cat, skunk, coyote, fox, raccoon, opossums, or bat, they are at risk of contracting rabies and should begin a treatment program. If the animal that was involved can be positively identified and safely captured, it should be held for testing to determine if it is infected with rabies or other zoonotic diseases.

Bites by venomous snakes are always emergencies, and the victim should be immediately transported to the nearest medical treatment facility. If the snake can be identified or killed/captured, it may help in the selection of the proper antivenin for treatment.

Certain ants, bees, and wasps can cause painful stings and, in some cases, severe allergic reactions. The local fire department is usually the primary responder to bee sting incidents. Fire department personnel have been trained to protect and manage bee sting victims. A stinging incident is not considered a pest control response issue, but rather, an emergency response and any and all appropriate bee control measures can be used. If fire department response is delayed, installation first responders should be trained how to protect themselves and victims from bee stings.

6.2 AGRICULTURAL EMERGENCIES

Agricultural emergencies are the result of the introduction of insects or other animals that can cause extensive damage to agriculture or forestry in the state. Examples of introduced agricultural pests include the Mexican fruit fly and gypsy moth. Military installations can be a conduit for the introduction of these pests due to the movement of military equipment and personnel in and out of the state and the country. The military's role in preventing introduction of these pests is described in OPNAVINST 6210.2, Quarantine Regulations of the Navy and SECNAVINST 6210.2A, Quarantine Regulations of the Armed Forces. Inspections to prevent importation of pests are normally conducted at the port of debarkation in the foreign country.

6.3 Emergency Pest Management Resources

Installation PMSPs maintain pesticides and equipment to manage most emergencies. Contract PMSPs can be used for emergencies if it is written in the contract specifications. The Naval Branch Health Clinic developed an EDVCP to manage public health emergencies (appendix G). It includes additional Navy and local government contingency vector surveillance and control resources.

CHAPTER 7

Program Resources

Naval Construction Battalion Center Gulfport has access to the following support agencies and organizations for pest management assistance. Contact information specific to the installation is included in appendixA.

7.1 NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC APPLIED BIOLOGY

Naval Facilities Engineering Command, Atlantic Applied Biology is currently staffed by full-time, civilian DOD professional pest management consultants certified in DOD pesticide applicator categories 3, 5, 6, 7, 8, and 11. These personnel are assigned the following responsibilities:

1. Review and approve installation IPMPs in accordance with DOD and Navy policies

2. Provide technical assistance to the installation IPMCs, environmental managers, safety officers, medical officers, and other regional and installation personnel regarding pest management and pesticide regulatory compliance

3. Review and approve or reject pesticides and equipment to be used on installations

4. Conduct on-site program reviews and environmental compliance program external assessments to ensure compliance with the regulations and IPMPs

5. Compile and report actual pesticide use and pest management operations to appropriate DOD agencies

6. Provide IPM recommendations and pest identification;

7. Assist installations with writing or re-writing IPMPs

8. Provide recertification training for DOD-certified applicators as well as initial and recertification training for PMPARs/IPMCs.

The NAVFAC Applied Biology Web site is at: https://hub.navfac.navy.mil/webcenter/portal/ev/EV+Divisions/EV2+Planning+and+Conservation/Applied+Biology. This site is on the Naval Facilities Engineering Command intranet and is only available to NAVFAC, CNIC, and U.S. Marine Corps personnel who have an account. To request an account, personnel must have a sponsor with access approve the request through the initial single sign-on (SSO) page.

7.2 NAVY ENTOMOLOGY CENTER OF EXCELLENCE

Navy Entomology Center of Excellence (NECE) is a subordinate command of Navy and Marine Corps Public Health Center and is staffed by full-time, active duty U.S. Navy entomologists. The entomologists

are certified in DOD pesticide applicator categories 3, 5, 6, 7, 8, and 11. The unit's Vector Control Department provides the following products and services:

1. Act as BUMED's professional pest management consultants to provide BUMED review of IPMPs

2. Provide technical assistance on the surveillance and control of vectors on installations

3. Provide vector-borne disease risk assessments and disease prevention recommendations when requested

4. Provide disease vector management consultation and identification services

5. Provide contingency pest management in the event of a disaster or disease outbreak (see the Emergency Vector Surveillance and Control Plan in appendix I)

6. Provide initial certification for DOD-certified pesticide applicators

The Navy and Marine Corps Public Health Center Web site is at: http://www.med.navy.mil/sites/nmcphc/nece/Pages/default.aspx.

7.3 NAVY ENVIRONMENTAL AND PREVENTIVE MEDICINE UNIT TWO

The Navy Environmental and Preventive Medicine Unit Two (NEPMU-2) is staffed by three full-time, active duty Navy entomologists. The entomologists are certified in DOD pesticide applicator categories 3, 5, 6, 7, 8 and 11 and are assigned the following responsibilities:

1. Acts as BUMED's professional pest management consultants to provide BUMED review of Emergency Vector Surveillance and Control Plans

2. Provides technical assistance on the surveillance and control of vectors on installations

3. Provides vector-borne disease risk assessments and disease prevention recommendations when requested

4. Provides disease vector management consultation and identification services

5. Provides contingency pest management in the event of a disaster or disease outbreak.

The NEPMU-2 Web site is at: http://www.med.navy.mil/sites/nepmu2/Pages/default.aspx.

7.4 MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE

The Mississippi State University Extension Service responds to the needs of individuals and organizations in Mississippi by providing information and guidance in the areas of agriculture, natural resources, and consumer sciences.

The Web site is at: http://msucares.com/.

Pest management service providers can obtain soil sample kits from the local extension office and send them in for analysis. Extension agents can also visit the base to help in diagnosing problems.

7.5 MISSISSIPPI DEPARTMENT OF AGRICULTURE AND COMMERCE

Personnel from the Mississippi Department of Agriculture and Commerce are the pesticide regulatory officials for the state. The main office is located in Jackson, MS and is staffed with personnel that can provide information regarding state and local pesticide regulations.

The Mississippi Department of Agriculture and Commerce Web site is at: http://www.mdac.state.ms.us/.

7.6 MISSISSIPPI DEPARTMENT OF HEALTH

The Entomology and Vector Control Program is responsible for the prevention and management of insect-transmitted diseases in the state of Mississippi. Entomologists survey and analyze the insect population of the state and direct efforts to control disease-carrying insects and related species.

The Mississippi Department of Health, Entomology and Vector Control Program Web site is at: http://msdh.ms.gov/msdhsite/_static/14,0,119.html.

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CHAPTER 8

Integrated Pest Management Sheets

The following sheets provide guidance for control of common pests. They should be used as a basis for pest management action, but should not be considered “regulations” for the job. Management sheets should be used as guidelines to help implement reasonable, cost effective, safe, environmentally responsible control of pests. The integrated pest management coordinator (IPMC) or other pest control personnel may choose to establish different thresholds and use IPM methods that are more appropriate to their local circumstances. Write in any new ideas or programs to maintain a document that will remain applicable over time. Any suggested pesticides from these sheets are required to be approved before use. The following IPM sheets represent the more common pests that occur in Mississippi and not necessarily all pests covered by contract.

NUISANCE PESTS

American Cockroaches

Cockroaches in Food Preparation Areas

Drain Flies

Fruit Flies

Nuisance Ants

Stored Product Pests in Food Storage Areas

HEALTH-RELATED PESTS

Bed Bugs

Filth Flies

Fleas In and Around Buildings

Mites

Mosquitoes, Adult Control

Mosquitoes, Larval

Spiders

Stinging Insects

Ticks

STRUCTURAL PESTS

Drywood Termites

Subterranean Termites

TURF AND ORNAMENTAL PESTS

Fire Ants

Ornamental Plant Pests

Snails and Slugs

VERTEBRATE PESTS

Bats

Nuisance Birds

Feral Cats

Raccoons

Rodents

VEGETATION MANAGEMENT

Invasive Weeds in Natural Areas

Terrestrial Weeds

Weeds in Right of Ways

Nuisance Pests

American Cockroaches

Cockroaches in Food Preparation Areas

Drain Flies

Fruit Flies

Nuisance Ants

Stored Product Pests

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American Cockroaches

TARGET PEST	
TARGET PEST(S)	American cockroaches (*Periplaneta americana*)
TARGET SITE(S)	Office buildings, warehouses, residences, storm sewers
PURPOSE	Control cockroaches that may cause damage through food contamination, affect human health through allergic reactions or "entomophobia", or be an aesthetic or morale nuisance.
RESPONSIBILITY	• All Personnel: Ensure proper sanitation in all living and working spaces. • Preventive Medicine Technicians: Conduct facility sanitation inspections, enforce food-handling regulations, and provide pest management recommendations. • Pest Management Service Provider: Conduct integrated pest management to control pest infestations. • Integrated Pest Management Coordinator: Oversee all pest management operations and ensure the use of IPM. • Pest Management Performance Assessment Representative: Ensure contracted PMSPs perform work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facility repairs and improvements that prevent and minimize pest infestations as requested.
SURVEILLANCE	
METHODS	• Visual inspections (visual surveys of low to moderate infestations may require visiting the facility at night) o Observation of pests in harborages o Inspect floor drains o Inspect areas with heat and moisture • Application of a flushing agent to suspected harborages • Sticky trap surveys • Vacuum surveys of harborages • Personnel complaints: including information on when, where, and how many pests were observed • Conduct pre- and post-treatment surveys to determine whether control operation was effective
FREQUENCY	• Daily observation by building occupants • Monthly observation and/or sticky trap monitoring by cognizant pest management or preventive medicine personnel

RECOMMENDED ACTION THRESHOLD	• Visual sighting of one or more cockroaches (all life stages) per room per survey—flushing agents or sticky traps may be used • Sighting of one egg capsule per survey
NONCHEMICAL CONTROL	
SANITATION	• Thoroughly clean potential food sources in buildings, especially coffee messes and food preparation areas. • Clean spills up as soon as possible. • Clean out floor drains by rinsing with hot water or using cleaners specifically designed to remove sludge from pipes. • Store food in pest-proof containers. • Empty trash cans daily or avoid putting food items in trash. • Do not eat at desk; eat in a designated coffee mess or dining area.
ELIMINATE HARBORAGE	• Seal cracks and crevices with caulk. • Remove corrugated cardboard and other materials that can serve as harborage.
ELIMINATE STANDING WATER	• Fix leaking plumbing especially around sinks, faucets, and dishwashers. • Remove standing water from floors after daily cleaning.
PREVENTION	Inspect food boxes before bringing them into a building.
MECHANICAL REMOVAL	Vacuum cockroaches from their harborages. Use a wet/dry vacuum cleaner filled with water or empty and dispose of vacuum bag immediately.
PEST PROOFING	• Seal holes in walls and ceilings and other areas that may serve as cockroach harborage as required. Request support from facilities maintenance provider if necessary. • Screen floor drains if possible.
EDUCATION	Proper storage of food and sanitation to prevent infestations.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Pyrethroids, fipronil, hydramethylnon, indoxacarb, imidacloprid, abamectin, boric acid, insect growth regulators.
METHODS	• Flushing Agents: The pest management service provider may use aerosol contact pesticides directed into potential harborage areas to flush out and kill pests as needed. • Crack and Crevice/Spot Treatment Residuals: The pest management service provider may apply a residual pesticide spray to all known or suspected harborages, feeding sites, or passageways (such as under dishwashers and refrigerators or behind stoves). • Baits: Cockroach baits (station containing solid bait or injectable style gel baits) will be used as much as possible. Gel bait can be applied to a sheet of hardware cloth and hung in manholes. Proper bait placement is critical to the success of treatment. Do not apply other insecticides around bait treatment areas. • Dusts: Boric acid dust is an effective low-toxicity insecticide that can be applied to wall voids and into manholes of storm sewers. The treatment area should remain dry after the application to avoid washing the dust away. • Growth Regulators: Affect the growth of the insect and prevents them from developing into egg-laying adults. Insect growth regulators will always be mixed with knock-down pesticides.

CONSIDERATIONS	
SENSITIVE AREAS	• Exposed food products, food containers, counter tops, any surface where food may be stored or prepared, or any food storage area. • Minimize application of pesticides directly into drains. • Use care in selecting pesticides for use in storm sewers as this can lead to storm water pollution problems. Applications should be made when dry and storm water is not anticipated within a week.
PROHIBITED PRACTICES	• Do not do preventive baseboard spraying in the absence of a pest. • Do not apply liquid or dust formulations to occupied spaces or in the presence of exposed food. • In food service areas, use only insecticides specifically labeled for those areas.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Most insecticides used for indoor pest control are low in toxicity (signal word "Caution"), but care should be taken to prevent exposure to humans and domestic animals. • Outdoor treatments with pyrethroids are susceptible to runoff and contamination of storm water. • Disposing of pesticides in a drain or storm drain is strictly prohibited.

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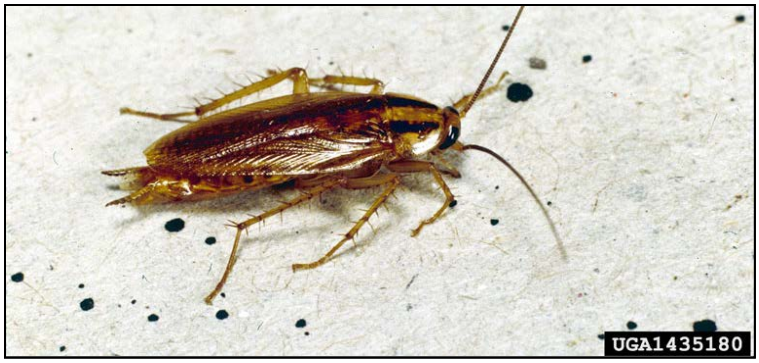

Cockroaches in Food Preparation Areas

TARGET PEST	
TARGET PEST(S)	Cockroaches (primarily German cockroach, *Blatella germanica*)
TARGET SITES(S)	• Food service facilities • All government dining facilities including galleys, sculleries, bakeries, storage, and mess decks. • All MWR facilities including clubs, restaurants, and storage. • All commercial lessees. • Coffee messes and snack bars in administrative areas.
PURPOSE	Control cockroaches that may cause food contamination, allergic reactions, or a nuisance.
RESPONSIBILITY	• Food Service Personnel: Ensure compliance with food handling regulations that prevent pest infestations. • Installation Preventive Medicine Technicians: Conduct food service inspections, enforce food handling regulations, provide quality assurance for pest control, and provide pest management recommendations. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested.
SURVEILLANCE	
METHODS	• Visual inspections o Observation of pests in harborages o Application of a flushing agent • Sticky trap surveys • Vacuum surveys of harborages • Personnel complaints: including information on when, where, and how many pests were observed. • Conduct pre- and post-treatment surveys to determine whether control operation was effective. • Surveys should identify environmental conditions conducive to infestation.
FREQUENCY	• Daily observation by food service personnel. • Monthly observation and/or sticky trap monitoring by cognizant preventive medicine personnel.

ACTION THRESHOLD	• Visual sighting of 3 or more cockroaches (all life stages) per room per survey. Flushing agents or sticky traps may be used. • Sighting of 1 egg capsule per survey.
NONCHEMICAL CONTROL	
SANITATION	• Cleaning of floors and all surfaces to include debris and grease removal. • Clean up spills. • Store food in sealed containers. • Remove cardboard boxes from storage areas. • Keep garbage in containers with tight-fitting lids and use liners.
ELIMINATE STANDING WATER	• Fix leaking plumbing especially around sinks, faucets, and dishwashers. • Remove standing water from floors after daily cleaning.
MECHANICAL REMOVAL	Vacuum cockroaches from their harborages. Use a wet/dry vacuum cleaner filled with water or empty and dispose of vacuum bag immediately.
PEST PROOFING	Seal holes in walls, ceilings, and other areas that may serve as cockroach harborage as required. Request support from facilities maintenance provider if necessary.
EDUCATION	• Proper storage of food and sanitation to prevent infestations and increase effectiveness of pesticide applications • Understanding of how baits work
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Fipronil, hydramethylnon, boric acid, indoxacarb, imidacloprid and abamectin baits; boric acid dust; pyrethroids
METHOD OF DISPERSAL	• Flushing Agents: The pest management service provider may use aerosol contact pesticides directed into potential harborage areas to flush out and kill pests as needed. • Crack and Crevice Residuals: The pest management service provider may apply (by crack and crevice technique) a residual pesticide spray to all known or suspected harborages, feeding sites, or passageways. • Spot Treatment Residuals: A residual pesticide may be applied as a spot treatment to indicated areas (such as under dishwashers and refrigerators or behind stoves). • Baits: Cockroach baits (station or injectable style gel baits) will be used as much as possible. Gel baits can be more effective than dry baits due to the moisture in the bait and because it can be applied to more areas. • Growth Regulators: Insect growth regulators will always be mixed with knock-down pesticides.
RESTRICTIONS/ REGULATIONS/ PERMITS	• Do not do spot treatments indoors. • Do not apply to baseboards as a preventive residual spray. • Do not apply liquid or dust formulations of insecticides in occupied spaces.
CONSIDERATIONS	
SENSITIVE AREAS	• Exposed food products, food containers, counter tops, any surface where food may be stored or prepared, or any food storage area. • Ensure that insecticides do not enter drains, streams, lakes, or other surface water.

PROHIBITED PRACTICES	• Do not use ultrasonic pest repelling devices. • Do not use aerosols, dusts, and other insecticide formulations that can become airborne in occupied spaces or when food is exposed; baits may be applied when spaces are occupied • Do not do preventive baseboard spraying in the absence of a pest.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Allow for ventilation of spaces after liquid insecticides have been applied. • Clean food preparation surfaces after treatment. • Applicators must wear personal protective equipment as required by the product label. • Environmental impact is minimal since applications are performed indoors

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Drain Flies

TARGET PEST	
TARGET PEST(S)	Drain flies (*Psychoda* sp.); sometimes called moth flies, sewage flies, or filter flies.
TARGET SITES(S)	Buildings where adult flies may become a nuisance. These flies may be very common around sewage treatment facilities, where they are considered beneficial decomposers of organic matter.
PURPOSE	Control flies that may be both a nuisance and a health hazard due to respiratory problems that can be associated with the inhalation of fly hairs and body parts. Drain flies are also able to mechanically transfer bacteria and other microorganisms from their breeding sites to places where humans live and work.
RESPONSIBILIES	• All personnel: Ensure proper sanitation in all living and working areas to avoid conditions that are attractive to flies. • Facilities Maintenance Service Provider: Periodically clean drain pipes to prevent buildup of organic matter where drain flies breed. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contracted pest management service provider performs work in accordance with contract specifications.
SURVEILLANCE	
METHODS	• Visual sighting: Adult drain flies will congregate on walls and windows of rooms containing drains where drain flies are breeding. Adults are weak fliers, and usually make a series of short, erratic flights to move from one area to another. The body and wings are hairy, and the wings are held roof-like over the body when at rest, giving the fly a moth-like appearance. Adult coloration is yellow, gray, or black. • Source drain: An attempt should be made to locate the drain(s) from which flies are emerging so that the breeding sites can be targeted. Sealing the suspected drain opening with a glue board, masking tape, or inverted plastic cup overnight should trap adult flies if they are present.
FREQUENCY	Scheduled surveys are not typically required. The presence of flies resting on walls in restrooms and other areas with drains will typically prompt a request for pest control.
ACTION THRESHOLD	Sufficient numbers of flies to constitute a nuisance indicate the need for treatment.

NONCHEMICAL CONTROL	
HABITAT REMOVAL	• Drain cleaning: Drain flies breed in accumulated organic matter inside drainpipes. This material may be removed with over-the-counter drain cleaners. A stiff brush may be necessary to remove heavy buildup. • Bacterial drain cleaners: Products containing a specialized complex of bacteria can be used to digest the organic matter in which drain fly larvae breed and should then be followed by rinsing with very hot water. These products cannot be used in conjunction with other cleaning products, and are only available to pest control operators.
EDUCATION	• Educate building occupants on sanitation, and proper food disposal.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Pyrethrum-based
METHOD OF DISPERSAL	Pyrethrum-based aerosols may be used to kill adult flies. However, the breeding site must be eliminated to prevent additional flies from emerging.
RESTRICTIONS/ REGULATIONS/ PERMITS	Do not apply liquid or dust formulations in occupied spaces.
CONSIDERATIONS	
SENSITIVE AREAS	• Chemical pesticide use inside hospitals should be minimized as much as possible to avoid exposing patients. Control should focus on drain cleaning, which will provide better control and reduce the health risks associated with pesticides. • Ensure that insecticides do not enter drains, streams, lakes and other surface water.
PROHIBITED PRACTICES	• Do not use ultrasonic pest repelling devices. • Do not apply aerosols, dust, and other insecticide formulations that can become airborne to occupied spaces or when food is exposed.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Allow for ventilation of spaces after liquid insecticides have been applied. • Clean food preparation surfaces after treatment. • Applicators must wear personal protective equipment as required by the product label. • Minimal

Fruit Flies

TARGET PEST	
TARGET PEST(S)	Small flies in the family Drosophilidae, commonly called fruit flies or vinegar flies.
TARGET SITES(S)	Refuse containers, offices with windows facing the loading docks, galleys, and other areas that may have ripening fruit.
PURPOSE	Control flies that reduce the quality of life.
RESPONSIBILITY	• All Personnel: Ensure proper sanitation in all living and working areas to avoid conditions that are attractive to flies. • Janitorial Personnel: Ensure that refuse containers are emptied daily. Also, periodically clean refuse containers to prevent the buildup of organic matter where flies breed. • Facilities Maintenance Provider: Provide necessary building repairs and modifications needed for pest exclusion. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications.
SURVEILLANCE	
METHODS	• Flies are attracted to ripening and rotting fruit, as well as other decaying organic matter. • Flies can be seen hovering around refuse containers and resting on walls and cabinets near refuse containers. Fruit flies can be distinguished from other small flies by their tan or yellow colored bodies and red eyes.
FREQUENCY	• Scheduled fly surveying is generally not necessary. • Scheduled sanitation should prevent infestations.
ACTION THRESHOLD	The presence of flies in numbers constituting a nuisance for personnel indicates a need for control.
NONCHEMICAL CONTROL	
SANITATION	• Refuse removal: Waste baskets and other refuse containers should be emptied daily to prevent the buildup of decaying matter that will attract flies. • Refuse container sanitation: Fruit flies are attracted to moist fermenting foods. All they need for breeding is a moist film of decaying organic matter. They will lay their eggs in garbage disposals, empty bottles and cans, trash containers, mops and cleaning rags. Keep all these items clean. Over time organic debris builds up on the bottom and sides of waste containers,

	particularly large dumpster and other trash bins. Refuse containers should be periodically steam-cleaned or washed to remove organic matter.
ELIMINATE FOOD SOURCES	Fruit bowls: Fruit flies are attracted to volatiles produced by ripening fruit. Store fruit in the refrigerator in order to avoid attracting fruit flies and other pests.
PEST PROOFING	Exclusion: Flies may migrate indoors from breeding sites located outdoors. Tight fitting screens and weather proofing around doors and windows (caulking, weather stripping, etc.) may delay entrance.
CHEMICAL CONTROL	
METHOD OF DISPERSAL	• For chemical controls to work, all breeding sites must be found and cleaned first. Potential breeding sites which are inaccessible (e.g., garbage disposals and drains) can be inspected by taping a clear plastic food storage bag over the opening overnight. If flies are breeding in these areas, the adults will emerge and be caught in the bag. • Adults may be killed with pyrethrum-based aerosol insecticides applied as a space spray or surface residual.
CONSIDERATIONS	
SENSITIVE AREAS	• Fruit fly infestations often occur in food-preparation areas. Ensure that the insecticide is labeled for use in food preparation areas, and that foods are not contaminated during application. • Ensure that insecticides do not enter drains, streams, lakes, and other surface water.
PROHIBITED PRACTICES	• Do not use ultrasonic pest repelling devices. • Do not use aerosols, dusts, and other insecticide formulations that can become airborne in occupied spaces.

Nuisance Ants

TARGET PEST	
TARGET PEST(S)	Pharaoh ants, Argentine ants, black ants, crazy ants, and other nuisance species that invade structures
TARGET SITE(S)	Offices, food preparation and storage areas, living spaces, playgrounds, patios, barracks, medical treatment facilities, and other spaces invaded by ants
PURPOSE	Control ants that are a nuisance in offices, eat and contaminate food, and can make spaces uninhabitable or unusable.
RESPONSIBILITY	• All Personnel: Ensure proper sanitation in all living and working spaces. • Preventive Medicine Technicians: Conduct facilities sanitation inspections, enforce food-handling regulations, and provide pest management recommendations. • Pest Management Service Provider: Conduct integrated pest management to control pest infestations. • Integrated Pest Management Coordinator: Oversee all pest management operations and ensure the use of IPM. • Pest Management Performance Assessment Representative: Ensure contractor PMSP performs work in accordance with contract specifications. • Grounds Maintenance Provider: Control aphids and similar insects on ornamental plants that attract and feed ants. • Facilities Maintenance Provider: Perform facility repairs and improvements that prevent and minimize pest infestations as requested.
SURVEILLANCE	

METHODS	• Visual inspections
	  o Observation of foraging scout ants or ant trails
	  o Follow ant trails to building entryways and to food source
	  o Follow ant trails to nests
	• Personnel complaints: including information on when, where, and how many pests were observed.
	• Conduct pre- and post-treatment surveys to determine whether control operation was effective

FREQUENCY	• Daily observation by building occupants • Monthly inspections outdoors around buildings to identify ant nests

RECOMMENDED ACTION THRESHOLD	• Visual sighting of ants indoors • Food service areas: 3/room • Living areas: 5/room • Medical treatment facilities: 1/room • Grounds: 2 mounds/yard
NONCHEMICAL CONTROL	
SANITATION	• Thoroughly clean potential food sources in buildings, especially coffee messes and food preparation areas. • Thoroughly clean food preparation surfaces, countertops, and stoves. • Remove and discard food that is attractive to ants. • Clean up food and drink spills as soon as possible. • Do not leave dirty dishes on countertops or in sinks. • Some ants are attracted to moisture. Fix leaky plumbing and remove other sources of water.
MECHANICAL REMOVAL	• Use a wet sponge or cloth to wipe up ants. • Spray ant trail with household cleaner or soap water then wipe up.
PEST PROOFING	• Put food in tightly sealed containers. • Seal holes in walls with caulk or, temporarily, with petroleum jelly.
CONTROL OF PLANT INSECTS	• Ants live in cooperation with some plant-infesting insects such as aphids. • These insects produce sugars that are food for the ants, while the ants provide protection for the plant-sucking insects. • Control aphids and other plant-sucking insects on plants
EDUCATION	• Proper storage of food and sanitation to prevent infestations. • Use of soapy water to control ants indoors.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	• Arsenic trioxide, abamectin, borate-based products, fipronil, hydramethylnon, sulfuramid; pyrethroids (e.g., bifenthrin, lambda cyhalothrin)
METHOD OF DISPERSAL	• Baits: Bait stations can be used indoors or outdoors. Granular baits can be applied outdoors near nests. Baits are very specific to the species of ant, and effective in killing the egg-producing queen of the colony, but may require 2–3 days for complete control. • Barrier Spraying: Application of a residual outdoors around a building may be necessary if there are many nests and entryways into the building. May also be necessary if nests are difficult to find. Usually requires periodic reapplication if ant nests are not destroyed. • Dusts: Boric acid dust is an effective low-toxicity insecticide that can be applied to wall voids where ants may be nesting. The treatment area should remain dry after the application to avoid washing the dust away. • Granular insecticide: Acute toxicant in granular form. Only effective if applied directly to the nest.
CONSIDERATIONS	
SENSITIVE AREAS	• Exposed food products, food containers, counter tops, on any surface where food may be stored or prepared, or any food storage area. • Outdoors where children or pets may be exposed to pesticides. • Medical treatment facilities. • Streams, lakes, and other water sources. Avoid stormwater runoff of insecticides and do not apply directly to water. Many insecticides are highly toxic to aquatic organisms.

PROHIBITED PRACTICES	• Do not do spot treatments indoors. • Do not do preventive baseboard spraying in the absence of a pest. • Do not apply liquid or dust formulations of insecticides in occupied spaces.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Liquid and dust insecticides should not be applied to occupied spaces or when food is exposed; baits may be applied when spaces are occupied. • Allow for ventilation of spaces after liquid insecticides have been applied. • Clean food preparation surfaces after treatment. • Applicators must wear personal protective equipment as required by the product label. • Pyrethroid insecticides can be highly toxic to aquatic organisms.

COMMENTS:

For most people, ants become a problem and require action when they enter a building. Sometimes ants may nest in walls, especially if there is moisture in those areas; particularly bathrooms and kitchens. Surveys need to determine if the source of the infestation is indoors or outdoors. Control of ant nests outdoors during the spring and early summer may reduce ant problems later in the season. The most effective ant baits are slow acting to give worker ants enough time to carry small amounts of bait back to the nest where they will feed other ants and eventually kill the entire colony. For this reason, it may take several days to see results.

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Stored Product Pests in Food Storage Areas

TARGET PEST	
TARGET PESTS	Beetles and moths that infest food products
PURPOSE	Control stored product pests (SSPs) that may cause food contamination, medical problems, or be unsightly.
RESPONSIBLE PARTY	• Food Service Personnel: Ensure compliance with food handling regulations that prevent pest infestations; report infested food items to appropriate authority. • Installation Preventive Medicine Technicians: Conduct food service inspections, enforce food handling regulations, and provide pest management recommendations. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • U.S. Army Veterinary Services: Perform food quality inspections of storage facilities including surveys for SPPs.
SURVEILLANCE	
METHODS	• Visual inspections of food items before and during storage. Conduct in accordance with MILSTD 904B. • Attractant traps may be used to monitor movement and spread of SPPs in storage areas. They are inefficient as a means of control. Guidelines for the use of traps are found in AFPMB TG 27, Stored Product Pest Monitoring Methods • Personnel complaints
FREQUENCY	• Particular attention should be given to animal feed which are a common source of infestation. • Daily observation by food service personnel • Monthly observation by cognizant preventive medicine personnel. • Routine food inspections by US Army veterinary technicians.

ACTION THRESHOLD	• Observation of any number of SPP (whole insect, webbing, droppings, skins) inside or immediately outside of package. This should initiate a more thorough survey and control if necessary. • Observation of one SPP on a monitoring trap.
NONCHEMICAL CONTROL	
SANITATION	• Maintain thorough sanitation of food storage area • Clean up all spills immediately
PACKAGING AND STORAGE	• Ensure all packages are intact. Place in sealed insect proof containers if available • Repair any torn packages • Rotate food items: "first-in-first-out"; do not allow food to remain stored for long periods of time • Store on pallets off the floor. • Maintain adequate ventilation and lighting in storerooms.
ISOLATION	Remove infested items from the storeroom if they can't be disposed of immediately.
MECHANICAL REMOVAL	Vacuuming, sweeping, mopping of floors on which SPPs are found may be used. Ensure that a wet/dry vacuum filled with water is used or remove, empty, and dispose of vacuum bag immediately.
FREEZING/ HEATING	SPPs may be killed by freezing or cooking. Insects can be removed from food item by sifting
SURVEY (DISPOSAL)	Dispose of infested food items (see MIL-STD-904C, Detection, Identification, and Prevention of Pest Infestation of Subsistence for guidance)
CHEMICAL CONTROL	
METHOD OF DISPERSAL	• Since many infestations are confined to the food packages, nonchemical methods are the preferred control method. • Crack and Crevice Applications: The pest management service provider may apply (by crack and crevice technique) a contact or residual pesticide spray to areas in storerooms where insects may be found after leaving infested packages. • Insect Growth Regulators: Insect growth regulators (IGR) prevent immature insect larvae from developing into mature adults. IGRs may be useful for chronic SPP problems, but cannot be applied to food or cause immediate kill of the pest. It must be used in conjunction with other forms of control. • Fumigation: Consult a NAVFAC pest management consultant before considering fumigation. Fumigation can be performed on pallets of food items. It will penetrate most materials to kill insects inside the food without harming or making inedible the food item.
CONSIDERATIONS	
PROHIBITED PRACTICES	• Do not use aerosols, dusts, and other insecticide formulations that can become airborne in occupied spaces. • Do not do preventive baseboard spraying in the absence of a pest.
SENSITIVE AREAS	• Exposed food products, food containers, counter tops, on any surface where food may be stored or prepared, or any food storage area. • Ensure that insecticides do not enter drains, streams, lakes and other surface water.

COMMENTS:

Review TG 29, Integrated Pest Management In and Around Buildings or view the Department of Defense Armed Forces Pest Management Board Web site at
http://www.afpmb.org/sites/default/files/pubs/techguides/tg29.pdf

Review TG 27, Stored Product Pest Monitoring Methods at
http://www.afpmb.org/sites/default/files/pubs/techguides/tg27.pdf

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HEALTH-RELATED PESTS

Bed Bugs

Filth Flies

Fleas In and Around Buildings

Mites

Mosquitoes, Adult Control

Mosquitoes, Larval

Spiders

Stinging Insects

Ticks

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Bed Bugs

TARGET PEST	
TARGET PESTS	Bed Bugs (*Cimex* spp.)
PURPOSE	Control bed bugs that can cause bites or allergic reactions, be a nuisance, and affect morale and quality of life. Can be carried on board ship from infested barracks.
RESPONSIBLE PARTY	• Berthing Quarters Managers: o Establish rules and regulations to prevent establishment and propagation of pests. o Prevent movement of furniture between rooms if bedbugs are identified • Berthing Quarters Residents: o Comply with quarter's rules and regulations. o Maintain sanitation and cleanliness of personal items such as bedding. • Cognizant Military Unit Leadership: The command leadership, from the commanding officers to the non-commissioned officers, is responsible for their personnel and must enforce public health measures to protect their health and well-being. Sanitation and other pest prevention measures should be enforced through room inspections if necessary. • Installation Preventive Medicine Technicians: o Conduct berthing inspections o Enforce berthing regulation per NAVMED P-5010 o Provide informal quality assurance for pest control o Provide pest management recommendations • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested.

SURVEILLANCE	
METHODS	• Personnel complaints: Complaints are commonly received when a patient goes to medical complaining of itching or dermatitis due to bites. • Visual inspections o Look for pests in mattresses, box springs, bed frames, and headboards. Less commonly found on baseboards and on walls behind furniture. o Application of a flushing agent to cracks and crevices • Sticky trap surveys • Vacuum surveys of harborages • Conduct pre- and post-treatment surveys to determine whether control operation was effective • Dry ice/CO_2 attractant traps • Bed-bug sniffing dogs are available.
FREQUENCY	• Daily observation by residents. • Observation during zone inspections by unit command leadership personnel. • Monthly observation and/or sticky trap monitoring by PMT of spaces post-treatment. • In visitor's quarters, lodges and other hotel rooms, housekeeping should perform inspections during cleaning.
ACTION THRESHOLD	Detection of 1 bed bug, cast skins, or fecal stains should initiate survey and control.
NONCHEMICAL CONTROL	
SANITATION	• Thorough cleaning (field day) shall be performed in each room. • Remove all clutter particularly from under and around beds to reduce harborage. Removal of clutter also enables easier inspection of furniture and mattresses. Note: When removing materials from an infested room, either treat the material or place in bags then seal before taking out of room to prevent spread of the bugs.
WASHING/ CLEANSING	• Thoroughly wash bedding • Clean mattresses, box springs, frames, headboards with soap and water.
MECHANICAL REMOVAL	Vacuum bedbugs from their harborages on mattresses, headboards and other surfaces where they are found. Use a wet/dry vacuum cleaner filled with water or empty and dispose of vacuum bag immediately.
ISOLATION AND EXCLUSION	• Prevent removal of furniture from rooms found to be infested until they are cleaned. • Remove debris from around outside of buildings • Repair cracks in walls • Caulk windows and doors • Caulk cracks and crevices in bed frames and furniture • Specially designed mattress encasements without seams will prevent bed bugs from getting on mattresses and leaving mattresses to infest other areas.

HEAT	• Heat infested articles and/or areas through to at least 113 °F (45 °C) for at least one hour. The higher the temperature, the shorter the time needed to kill bed bugs at all life stages. • A pesticide barrier around doorways may be necessary to prevent spread of fleeing bed bugs to adjacent spaces. • Infested bedding and clothing can be placed in a clothes dryer on high heat. Note: Heat may damage sprinkler systems and will require protective measures before treatment of rooms.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	• Pyrethrin, pyrethroids (cyhalothrin, bifenthrin, deltamethrin), hydroprene (IGR), chlorfenapyr, dichlorvos strips, silica gel, boric acid • Chemicals that leave a residual are preferred.
METHOD OF DISPERSAL	Chemical control using insecticides alone will not control/prevent a bed-bug infestation. • Flushing Agents: The pest management service provider may use aerosol contact pesticides directed into potential harborage areas to flush out and kill pests as needed. • Crack and Crevice Residuals: The pest management service provider may apply (by crack and crevice technique) a residual pesticide spray to all known or suspected harborages. • Spot Treatment Residuals: A residual pesticide may be applied as a spot treatment to indicated areas. • Mattress Treatment: Infested mattresses can be treated. Using a residual insecticide will prevent future infestations. • Slow-release vapor strips: A plastic strip impregnated with Dichlorvos slowly releases an insecticide vapor that will control flying and crawling pests. Treatment times are 48–72 hours for adults and nymphs and 7–1- days for eggs. Any room/area where strip is placed must be vacated by people and pets during the treatment. This can also be placed in containers or bags to treat infested materials. • Insect Growth Regulators (IGRs): Affect the development and reproduction of predators. When properly applied, IGRs have essentially no effect on vertebrate metabolism because of their mode of action and low application rates, but they have a significant impact on bed-bug molting, fertility, and egg hatching success.
RESTRICTIONS	• Insecticide resistance may cause treatment failure • Use of aerosols, dusts, and other insecticide formulations that can become airborne shall not be applied in occupied spaces. Spaces must be vacated before treatment and then ventilated and the insecticide allowed to dry before personnel are allowed to occupy the space.
CONSIDERATIONS	
SENSITIVE AREAS	• Some persons may be sensitive to some pesticides. Pesticide applications should be avoided if possible and be made only to areas where pests have been observed. • The insecticide on treated mattresses should be allowed to dry and then should be covered with a mattress cover before use. • Ensure that insecticides do not enter drains, streams, lakes, or other surface water.

PROHIBITED PRACTICES	• Do not use ultrasonic pest repelling devices. Do not apply aerosol, dust, or other insecticide formulations that may become airborne in occupied spaces. • Do not do preventive baseboard spraying in the absence of a pest.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	Minimal

ADDITIONAL INFORMATION:

Treatment failure may be due to incomplete surveys for the pest, improper application, and insecticide resistance. Follow-up inspections and control are crucial to eliminating the bugs.

Filth Flies

TARGET PEST	
TARGET PEST(S)	House flies (*Musca domestica*), face flies (*Musca autumnalis*), stable flies (*Stomoxys calcitrans*), little house flies (*Fannia* spp.), and other fly species that breed in garbage, compost, manure, or other organic debris.
TARGET SITES(S)	• Animal kennels or stables • Refuse storage areas • Any places where organic debris may accumulate • Dumpsters • Garbage dumps and recycle centers
PURPOSE	Reduce populations of flies that are a nuisance and may mechanically transmit pathogens.
RESPONSIBILITY	• Food Service Personnel: Ensure compliance with food handling regulations that prevent pest infestations • Installation Preventive Medicine Technicians: Conduct food service inspections, enforce food handling regulations, provide quality assurance for pest control, and provide pest management recommendations • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Janitorial Personnel: Ensure that refuse containers are frequently emptied and sanitized. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provide: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested.
SURVEILLANCE	

METHODS	• Visual sighting o Flies that enter buildings will congregate around windows. o Flies may be seen crawling on or flying around organic debris. o Flies are active during the daytime in warm weather. o Flies may be seen flying and landing on dumpsters and trash cans. o Visual surveys of adult flies should also identify where flies are entering a building and where they are breeding. • Bites o Adult stable flies will painfully bite humans, dogs, and livestock. o Stable flies may be surveyed by counting the flies on all four legs of livestock animals. o Most filth flies do not bite. • Trapping o Light traps: traps can be used to control adult flies as well as monitor populations. Flies are attracted to ultraviolet light and trapped on a sticky pest strip. o Sticky traps: Traps can be placed around areas where filth flies are known to be a problem. Many types contain visual lures. o Pheromone traps: Use a fly pheromone (muscamone) to attract flies to a container. Directions for constructing a baited jug trap can be found at http://ohioline.osu.edu/b853/b853_4.html. • Spec counts o Index cards (3×5) may be placed around areas to be monitored. Flies that land on the cards will leave vomit or fecal specs that can be counted. Though inexpensive and simple, this technique gives no indication of fly species and may overestimate fly numbers since a single fly may leave multiple specs. Note: Identification of adult flies is important in determining where flies are breeding in order to target control at the source of the infestation. If you can't find the breeding locations of the flies, then collect some flies and identify or send to an entomologist for identification.
FREQUENCY	• Visual observations should be made around likely breeding sites (e.g., dumpsters). • Traps should be inspected weekly. More frequent inspection may be necessary if sticky traps are placed in areas where they will quickly become covered with dust, insects, or other debris. • Counts of flies on animals should be conducted weekly.
ACTION THRESHOLD	• The presence of biting flies in numbers constituting a nuisance for people or animals indicates a need for control within 24 hours if the presence is interfering with the mission or activities. • For counts on livestock, an average of 10 stable flies per animal indicates a need for control. • For counts on sticky traps, 100 flies per week indicates a need for control.

NONCHEMICAL CONTROL	
BIOLOGICAL CONTROL	• Several species of parasitic wasps can be purchased for use against filth flies. • Biological control agents do not kill adult flies. Wasps lay their eggs in fly pupae, where the wasp larvae consume the developing fly, preventing it from emerging. • Biological control agents will not sting or otherwise harm humans or animals. • Biological control agents are not compatible with chemical insecticides. • Release timing, climatic conditions, release frequency, and number of agents released are all critical for biological control success. • Contact pest management consultants for additional information before instituting a biological control program.
TRAPPING	• Ultraviolet light traps may be used to reduce adult fly populations in buildings invaded by flies. • Exercise caution when placing traps; if the trap is visible from outside the structure, it may attract flies into the building. • Traps by themselves are unlikely to control heavy fly infestations. • Do not use bug zappers that electrocute flies in food-preparation areas or eating facilities. Use attractant light traps that collect flies on sticky traps.
SANITATION TO ELIMINATE BREEDING SITES AND FLY ATTRACTANTS	• Eliminating breeding sites is critical for effective filth fly control. • Filth flies often breed in neglected refuse containers. • Cover outdoor trash containers with tight-fitting lids. • Empty trash containers frequently. • Sanitize trash containers that have accumulated organic material. • Steam clean dumpsters regularly. • Do not allow animal manure to build up. • Maintain compost piles to promote rapid decay of organic material. • Do not place compost piles near areas where flies are likely to become a nuisance. • Hydrated lime may be applied to stable floors to speed manure decomposition and render stables less suitable for fly breeding.
PEST PROOFING	• Seal cracks and other openings around doors and windows. • Use tight-fitting screens. • Air-screens/air-curtains may be installed in commercial facilities.
EDUCATION	• Educate building occupants on sanitation, excluding flies by closing doors and maintaining screens, and proper food storage.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Pyrethroids, dichlorvos (in insecticide strips), methomyl, and others

METHOD OF DISPERSAL	• Non-residual space spray or aerosol: may temporarily control adult fly populations in buildings; will not provide long-term control unless breeding sites are eliminated. • Residual insecticides: may be applied to areas outside where adult flies rest; will not provide long-term control unless breeding sites are eliminated. • Baits: may be used around refuse containers and other places to which flies are attracted. Do not use baits indoors or in other areas where flies are not already present. Baits may attract flies to an otherwise fly-free area. • Impregnated strips: Plastic/paper strips impregnated with insecticides will kill adult flies that contact the strips. Useful when placed inside trash cans or other unoccupied spaces. • Insect repellents: may be used on humans or animals for temporary prevention of stable fly bites. Will not provide long-term control of fly populations, and must be frequently re-applied. • Oral larvicides: may be administered to livestock; will render manure unsuitable for fly breeding.
RESTRICTIONS/ REGULATIONS/ PERMITS	• Do not apply liquid or dust formulations in occupied spaces. • Dichlorvos is a carcinogen and cannot be placed in occupied spaces.
CONSIDERATIONS	
SENSITIVE AREAS	• Filth fly infestations often occur in food-preparation areas. Ensure that the insecticide is labeled for use in food preparation areas, and that foods are not contaminated during application. • Emphasize nonchemical control in areas frequented by children (e.g., child development centers). • Ensure that insecticides do not enter drains, streams, lakes, and other surface water.
PROHIBITED PRACTICES	• Do not use ultrasonic pest repelling devices. • Do not use aerosols, dusts, and other insecticide formulations that can become airborne in occupied spaces.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Take precautions when using pesticides around food service areas and the child development center. • Applicator should use personal protective equipment as required by the product label. • Avoid contaminating water with pesticides. • Space spraying outdoors can result in drift and have impact on non-target organisms.

COMMENTS:

The numbers of products available for filth fly monitoring and control is overwhelmingly large. The efficacy of a given product often depends on local climatic characteristics, the severity of the infestation, the species comprising the infestation, and other localized conditions. Also, many products are available that do not work or whose efficacy is unproven. Pest management consultants or county or state extension personnel can assist with choosing fly control methods that are most appropriate for a given area.

Fleas In and Around Buildings

TARGET PEST	
TARGET PESTS	Dog, cat, and rodent fleas
TARGET SITES(S)	Military family housing, administrative and industrial buildings that harbor feral cats and other animals, and dog kennels
PURPOSE	Control fleas that are a biting nuisance and pose the potential for transmission of diseases such as murine typhus.
RESPONSIBILITY	• Veterinary Services: Prescribe pet treatments for flea control • Pet owner/Dog handlers: Treat animals for flea infestations. • Installation Preventive Medicine Technicians: Conduct surveys and inspections of pests of public health importance to assess health risk. • Pest management service provider: Conduct integrated pest management to control infestations. • Pest Control Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested.
SURVEILLANCE	
METHODS	• Observe for fleas on pets or while grooming and washing pets • Walk around a room with light colored pants • Pull a white cloth across the floor • Concentrate on areas where pets animals frequent or rest • Survey for feral cats and buildings under which they may be harboring; survey in crawl spaces
FREQUENCY	Flea infestations are usually reported by housing residents or building occupants. Survey should be conducted by the PMSP to determine where to treat.
ACTION THRESHOLD(S)	• One flea per room • One flea-infested animal in or under a building

NONCHEMICAL CONTROL	
VACUUMING	Using a vacuum cleaner with a rotating brush on an infested carpet will remove a majority of the adults, larvae, and eggs. Should be done even if an insecticide will be applied. Hard surfaces should also be vacuumed if they contain cracks and crevices.
CARPET CLEANING	Steam cleaning or cleaning with a carpet cleaner, especially after vacuuming, may be sufficient to remove remaining fleas from carpet.
CLEAN PET BEDDING	Launder in soap and water all pet bedding and any other materials upon which dogs or cats sleep
CONTROL AND EXCLUDE FERAL CATS	• Feral cats are a common source of fleas in industrial and office buildings and are often encouraged by uninformed cat lovers to harbor under buildings. • DOD policy requires removal of feral animals from installations; neutered cats still carry fleas. • Cat harborages under buildings should be cleaned and treated with an insecticide. • Openings to crawl spaces should be sealed to exclude animals.
GROOM AND WASH PETS	• Flea combs can be used on pets to extract fleas. • Washing pet with soap and water is very effective at killing fleas.
EDUCATION	• Teach pet owners about ways to prevent fleas and treat pets for fleas • Provide awareness to installation personnel about the risk of flea infestations caused by feral cats. • Pre-treatment awareness of the need to clean/treat pets and pet bedding concurrently with the PMSP's insecticide treatment of the premises.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Pyrethroids, methoprene and pyriproxyfen (insect growth regulators), fipronil, imidacloprid, lufenuron, spinosad, and others

METHODS OF DISPERSAL	• <u>On-pet Treatments</u>:
	  o Spot-on treatments, such as Frontline (fipronil) and Advantage (imidacloprid) are convenient and easy to use and very effective at preventing fleas when monthly treatments are maintained throughout the season (late spring to early fall).
	  o Oral treatments, such as Program (lufenuron) are effective and useful on pets that frequently swim or are bathed frequently.
	• <u>Indoor Treatment</u>: These treatments target areas where pets rest or on carpets and other surfaces that might hold adult and immature fleas. The most effective treatments contain IGRs which are often mixed with a contact insecticide (such as a pyrethroid). The contact insecticide will kill any existing adult fleas while the residual IGR will prevent larvae from becoming biting adults.
	• <u>Outdoor Treatment</u>: This is rarely necessary in residential situations if indoor and on-pet treatment is done correctly. Outdoor dog kennels and crawl spaces where feral cats were harboring should be treated if infested. Again, an IGR / contact insecticide treatment is most effective.

CONSIDERATIONS	
SENSITIVE AREAS	Medical treatment facilities, child development centers

PROHIBITED ITEMS	Do not use ultrasonic pest repelling devices.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	Applicators should use personal protective equipment as required by the product label.

ADDITIONAL INFORMATION:

Successful control of fleas in a building requires room cleaning (vacuuming and carpet cleaning, cleaning pet bedding), pet treatment or washing, and insecticide treatment be done within 12 hours of each other. Some of the products and devices that aren't effective for flea control are indoor aerosol foggers, (otherwise known as bug bombs), ultrasonic devices, herbal collars, vitamin B1, brewer's yeast, and flea repellents.

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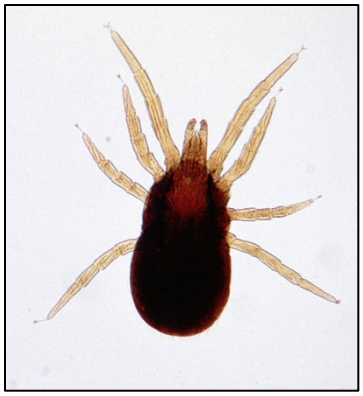

Mites

TARGET PEST	
TARGET PESTS	Mite parasites of animals (especially birds and rodents)
TARGET SITES(S)	Office buildings, industrial buildings, outbuildings, and residences
PURPOSE	Control mite infestations that may cause a biting nuisance.
RESPONSIBLE PARTY	• Pest Management Service Provider: Conduct integrated pest management to control infestations • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications • Installation Preventive Medicine Technicians: o Conduct surveys when pests pose a health threat o Provide pest management recommendations.
SURVEILLANCE	
METHODS	• Personnel complaints: o Most often mite infestations are recognized when personnel complain of bites associated with specific work spaces or areas of a building; the mite may or may not be observed. o Have the personnel who are being bitten keep transparent tape nearby. When they feel like they are being bitten, tap the area of the biting with the sticky side of the tape. Personnel should take the tape to preventive medicine to have it identified. • Workspace investigations: o Have personnel being bitten identify the specific areas in which they are being bitten. o Ask if any bird or rodent problems have occurred in the building and, if it has, ask if control has been performed recently. o Look for evidence of rodent or bird infestation in false ceilings, under floor boards, in rafters, inside walls, and outside of the building. o Observe light colored surfaces for mites. o Identify other sources of nonliving material that may cause a biting sensation such as visible particles especially those coming from ventilation ducts. • Sticky traps: place sticky traps around the area of infestation. • Identification of the mite will indicate whether the source is from a bird or rodent. Precise identification may require an entomologist. Contact NECE or NAVFAC Applied Biology.

FREQUENCY	When notified of a potential problem.
ACTION THRESHOLD	Identification of mites collected from a person(s) or from a sticky trap.
NONCHEMICAL CONTROL	
RODENT AND BIRD MANAGEMENT	• Preventing birds and rodents from entering a building will prevent mite problems. • See commensal rodent and nuisance bird pest management fact sheet for more information.
NEST REMOVAL	• Nests are the usual source of most mites. • Apply a pesticide to the nest to kill any mites (see below). • Remove nesting material and place in a double plastic bag. Clean area around nest with soap and water.
MITE REMOVAL	• Use soap and water to wipe up mites observed on surfaces. • Use a wet/dry vacuum filled with water to vacuum area where mites are found.
CHEMICAL CONTROL	
METHOD OF DISPERSAL	• Aerosols: Apply to cracks and crevices and other areas where mites are seen. • Dusts: Use in enclosed spaces where mites have been found.
CONSIDERATIONS	
SENSITIVE AREAS	Childcare facilities
PROHIBITED PRACTICES	Do not do preventive baseboard spraying in the absence of a pest.

Adult Mosquito Control

TARGET PEST	
TARGET PEST(S)	Flying adult pest mosquito species.
TARGET SITES(S)	Industrial and residential areas
PURPOSE	Control adult mosquitoes that are a nuisance or may transmit disease.
RESPONSIBILITY	• Housing Residents: o Use personal protective measures to prevent mosquito bites. o Ensure maintenance of window and door screens. o If screens are not available, keep doors and windows closed when mosquitoes are present. • Installation Preventive Medicine Technicians: o Conduct adult mosquito trapping to identify problem areas and mosquito species. o Map locations of trapping sites. o Conduct disease risk assessments including pathogen testing if available. o Provide information to housing residents on how to prevent mosquito biting. • Mosquito Control Provider: o Conduct surveys to verify presence of adult mosquitoes at site to be treated. Treat only when and where adult mosquitoes are present. o Use pesticides in accordance with the label. • Pest Management Performance Assessment Representative: o Ensure contractor pest management service provider performs work in accordance with contract specifications. o Conduct pre- and post-treatment surveys to monitor efficacy of control measures • Natural Resources Manager: Review and approve mosquito control operations conducted adjacent to sensitive areas to ensure minimal impact on the environment. • Housing Director: o Ensure that residents keep premises clear of clutter that can hold water and become breeding sites. o Ensure distribution of mosquito prevention and control information to residents. • Integrated Pest Management Coordinator: o Coordinate with PMTs, control provider, PMPAR, and natural resource manager to identify mosquito-breeding sites that can be permanently

<table>
<tr><td></td><td>eliminated by nonchemical methods.
o Maintain mosquito control operation records.</td></tr>
<tr><td colspan="2">SURVEILLANCE</td></tr>
<tr><td>METHODS</td><td>• Conduct surveys using visual assessments (i.e., landing counts) and/or traps at sites where personnel complain about mosquito bites to verify presence of mosquitoes.
• Record sites of verified complaints on a map. Use GPS receiver if available.
• Use traps weekly at same locations to reveal seasonal trends in mosquito abundance. Surveys can be used in subsequent years to plan mosquito control program.
• Trap mosquitoes for virus testing.
• PMTs will continue to conduct adult mosquito surveys.</td></tr>
<tr><td>FREQUENCY</td><td>• Ongoing surveys by residents.
• Survey prior to application of adulticide. For visual surveys, post-treatment surveys may be conducted immediately after the treatment. For traps, survey within 24 hours after application.</td></tr>
<tr><td>ACTION THRESHOLD</td><td>• Light traps: 25 biting females or 1 vector species in an un-baited light trap
• Landing counts: 15 per hour or 4 per 15 minutes
• Disease emergencies declared: light traps: 1 female of a species which has been identified as carrying disease within 5 miles of base caught in a trap

NOTE: Action thresholds can be changed on advice of a BUMED entomologist

<u>Vector species of concern</u> — <u>Primary diseases of concern</u>
Culiseta melanura — Eastern equine encephalitis (EEE),West Nile Virus (WNV)
Culex pipiens complex — EEE, St. Louis encephalitis, WNV
Culex nigripalpus — EEE, St. Louis encephalitis, WNV</td></tr>
<tr><td colspan="2">NON-CHEMICAL CONTROL</td></tr>
<tr><td>PERSONAL PROTECTION</td><td>• Encourage use of repellents when outdoors in mosquito-infested areas. Products with the active ingredient diethyl toluamide (DEET) are most effective.
• Avoid outdoor activities at dusk and during the evening hours to lessen chances of being bitten.
• Wear long-sleeved shirts and pants when outdoors in mosquito infested areas.</td></tr>
<tr><td>EXCLUSION/PEST PROOFING</td><td>• Window and door screens
• Remove tall weeds and overgrowth to remove possible resting areas for mosquitoes.</td></tr>
<tr><td>TRAPS</td><td>Propane-powered trapping devices that use heat and a chemical attractant have been shown to be effective for small to moderate area control of certain species of mosquitoes.</td></tr>
<tr><td colspan="2">CHEMICAL CONTROL</td></tr>
<tr><td>COMMON ACTIVE INGREDIENTS</td><td>Organophosphates, such as malathion and naled; pyrethrum and pyrethroids</td></tr>
</table>

METHOD OF DISPERSAL	• Organophosphates (i.e., malathion, naled): Apply with ULV or fog-generating equipment. Some chemicals may be corrosive. Resistance to these chemicals is widespread. • Pyrethrum and Pyrethroids: Apply with ULV equipment. Safer for humans and mammals. May be toxic to non-target insects and fish.
SENSITIVE AREAS	All ULV-applied pesticides may affect aquatic organisms especially fish. Care should be taken to ensure proper insecticide droplet size, timing of application, environmental conditions, and calibration of equipment.

COMMENTS:

Emergency control operations as the result of a disease outbreak may require large area application of an adulticide. Aerial spraying using an appropriately labeled pesticide and application equipment may be used. However, all aerial spraying operations must be reviewed and approved by a pest management consultant from NAVFAC Applied Biology. Aerial spray operations must also be reviewed and approved by the installation's operations officer.

See AFPMB Technical Guide 13 for more information on ULV application of pesticides.

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Larval Mosquitoes

TARGET PEST	
TARGET PEST(S)	Mosquito larvae
TARGET SITES(S)	Catch basins, culverts, ponds, planters, gutters, drainage ditches, and freshwater marshes
PURPOSE	Control larval mosquitoes that are a nuisance or that may transmit diseases.
RESPONSIBILITY	• Housing Residents: o Eliminate backyard mosquito breeding sites. o Keep gutters and backyard ponds clean. • Preventive Medicine Technicians: o Survey and identify larval breeding sites o Map locations of breeding sites o Conduct disease risk assessments o Provide information to housing residents and installation personnel on how to prevent mosquito breeding and biting. • Mosquito Control Provider: o Conduct surveys to verify presence of larvae at site to be treated o Use integrated pest management methods to control mosquito larvae o Use pesticides in accordance with the label. • Pest Management Performance Assessment Representative: o Ensure contractor pest management service provider performs work in accordance with contract specifications o Conduct pre- and post-treatment surveys to monitor efficacy of control measures. • Natural Resources Manager: Review and approve mosquito control operations conducted adjacent to sensitive areas to ensure minimal impact on the environment. • Housing Director: o Ensure residents keep premises clear of clutter that can hold water and become breeding sites o Ensure distribution of mosquito prevention and control information to residents.

	• Integrated Pest Management Coordinator: o Coordinate with preventive medicine technicians, mosquito control provider, performance assessment representative, and natural resources manager to identify mosquito-breeding sites that can be permanently eliminated by nonchemical methods o Maintain mosquito control operation records.
SURVEILLANCE	
METHODS	• Maps should be used to identify non-residential water-holding sites. Conduct ground truthing to verify presence of sites. • Record all water-holding sites on a map or on a GPS receiver regardless of whether larvae are found or not. • Survey water-holding sites for larvae. Use a dipper to take water samples. Dip as follows: o 1 dip/10 ft in linear sources o 1 dip/100 ft^2 in wide sources o 2 dips/source when small source (i.e., catch basin) For the first two sources, dip until larvae are found, then record number of dips after that; do not count negative dips prior to this. • Record quantity as number of larvae/dip. Record negative sources. • Mark locations for treatment or treat immediately. • All positive larval sites will be identified on the map as larval sampling stations. These stations will be used in the ongoing surveillance program to detect the presence of mosquitoes after a high tide and when the action threshold for that site is exceeded, then control will be initiated. • PMTs will continue to look for and identify additional non-residential water-holding and breeding sites.
FREQUENCY	• Ongoing surveys by residents. • Weekly survey of permanent or semi-permanent sites. • Survey prior to application of larvicide and within 24 hours after application. (Method cannot be used after application of methoprene.)
ACTION THRESHOLD	One or more larvae per dip
NONCHEMICAL CONTROL	
MOSQUITO FISH	• *Gambusia affinis*, or mosquito fish, feed on mosquito larvae and other small aquatic animals and can eliminate and prevent mosquito breeding. • Mosquito fish can be placed into large ornamental ponds. • Mosquito fish are often introduced into a water source after treatment with a larvicide.
VEGETATION REMOVAL	Aquatic vegetation encourages mosquito breeding by slowing down water movement in ditches and streams and by providing larvae with protection from predators. Emergent and floating vegetation can be removed mechanically.
DRAINAGE	• Ponds may be drained to eliminate breeding sites. • Containers such as pet food dishes, garbage cans, garden pots, and wheel barrels should be emptied of water and prevented from collecting water.
PROPER IRRIGATION	Lawn and landscape should be irrigated properly to prevent over watering and run-off that can collect and produce mosquitoes.
CHEMICAL CONTROL	

COMMON ACTIVE INGREDIENTS	*Bacillus thuringiensis israelensis* (Bti), *Bacillus sphaericus,* methoprene, temephos, insect growth regulations (e.g., s-hydroprene, s-kinoprene), mineral oils, monomolecular films
METHODS OF DISPERSAL	• Bti.: Apply by hand (granules), hand-compressed or hydraulic sprayer (liquid), as briquettes, or by manual or powered granule spreader. Liquid cost-effective when applied to open water; granules effective when water is covered by heavy vegetation. • Methoprene: Apply by hand or manual or powered granule spreader (granules and pellets), as briquettes, or by hand-compressed or hydraulic sprayer (liquid). Methoprene slow-release briquettes can be applied as a pre-flood application to dry water-holding areas that have been surveyed and are known to produce mosquitoes. Risk assessments for methoprene's effects on non-target aquatic invertebrates mixed and may require trials in test plots before using in environmentally sensitive areas. • Surface Films: Apply by hand compressed sprayer. • Herbicides: Herbicides labeled for aquatic sites may be used to remove vegetation where removal by mechanical means is not feasible or practical.
SITE PREPARATION	Survey treatment site prior to application of Bti and methoprene to ensure that majority of mosquitoes are in larval stage. Both are not effective on pupae.
CONSIDERATIONS	
SENSITIVE AREAS	• Some catch basins and culverts drain into environmentally-sensitive habitats and pesticide use may have adverse effects. • Some permanent and semi-permanent water sources may be habitats for birds, fish, and other animals. Alterations, such as vegetation removal or drainage, introduction of fish, or herbicide application may have significant impact on these habitats. • Some drainage channels drain into environmentally-sensitive habitats and pesticide use may have adverse effects.

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Spiders

TARGET PEST	
TARGET PEST(S)	Various spiders. Medically important spiders such as the black widow (*Latrodectus hesperus*), the brown widow (*Latrodectus geometricus*), the desert recluse (*Loxoceles deserta*), the brown recluse (*Loxoceles reclusa*), and the hobo spider (*Tegenaria agrestis*).
TARGET SITES(S)	Housing and child development centers where young children may be at risk for spider envenomation, especially under playground equipment. Other areas where spiders are unwanted.
PURPOSE	• Control spiders that may cause envenomation or painful, serious bites. • Reduce discomfort or fear associated with the presence of spiders. • Webs are a nuisance.
RESPONSIBILITY	• All Personnel: Ensure proper of all living and working spaces as spiders harbor in areas that are rarely disturbed. • Installation Preventive Medicine Technicians: Conduct sanitation inspections. Investigate reported spider bites. Provide control recommendations. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications.
SURVEILLANCE	
METHODS	• Visual inspections: look for spiders and webbing in areas where people may be at risk for spider bites. • Personnel complaints: including information on when pests were observed, where, and how many. • Conduct pre- and post-treatment surveys to determine whether control operation was effective
FREQUENCY	• Daily observation by building occupants • Monthly inspections outdoors around buildings by PMSP to identify spiders.
ACTION THRESHOLD	Visual sighting of one medically-important spiders indoors/room.
NONCHEMICAL CONTROL	
VIGILANCE TO PREVENT BITES	Be cautious when entering areas that are infrequently visited and disturbed such as storage sheds, wood piles, attics, utility sheds, etc.

SANITATION	• Routinely clean out storage areas. • Vacuum carpets and furniture routinely. • Remove webbing from ceilings.
MECHANICAL REMOVAL	• Smash the spider. • Place a jar over the spider and slip a piece of paper under the opening. Relocate the spider outdoors. • Vacuum spiders and webs while cleaning. Use a wet/dry vacuum filled with water or carefully empty bag when done.
PEST PROOFING	• Avoid attracting flying insects to buildings with exterior lighting. Reducing flying insects near buildings will deny spiders of their food. Save energy and turn off lights, or use motion detectors or colored lamps that do not attract insects readily. • Seal cracks in the foundation and other parts of the structure and gaps around windows and doors.
EDUCATION	• Emphasize the importance of sanitation in preventing spiders. • Education and awareness to reduce the fear of spiders and to highlight the benefits of spiders
CURRENT NONCHEMICAL CONTROL PRACTICES	• Sanitation: in indoor storage areas, place boxes off the floor and away from walls to reduce harborages. Seal boxes with tape. • Vigilance
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Pyrethroids, silica gel, and other insecticides
METHOD OF DISPERSAL	Pesticides are a last resort for recurring problems, since non-chemical control methods, particularly mechanical, are very effective. • Residual application: Pesticide applications should be done only as a last resort for recurring spider problems. • Liquid Aerosol: Most indoor-use insecticides do not leave a residual and require direct application to the spider. • Dust: Sorptive dusts, such as silica gel, that are formulated with pyrethrin can provide residual control. Preventive baseboard spraying in the absence of a pest is prohibited.
SENSITIVE AREAS	• Outdoors where children or pets may be exposed to pesticides. • Ensure that insecticides do not enter drains, streams, lakes and other surface water.
CONSIDERATIONS	
PROHIBITED PRACTICES	• Do not use ultrasonic pest repelling devices. • Do not use aerosols, dusts, and other insecticide formulations that can become airborne in occupied spaces.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Applicators must use personal protective equipment as required by the product label. Insecticide liquid and dusts shall not be applied to occupied spaces. • Minimal. Avoid contamination of water with pesticides.

COMMENTS:

The greatest problem posed by spiders is arachnophobia, the fear of spiders. Most spiders are harmless and are very beneficial in controlling insects around buildings. Education of the public is an important part of control.

Brown recluses—Many of the purported bites attributed to brown recluses are probably other arthropod bites, skin infections, or allergic reactions misdiagnosed as brown recluse bites. For general information on brown recluse identification, go to https://spiders.ucr.edu/recluseid.html.

Brown widow—venom is more potent than black widow venom. However, they do not inject as much venom as a black widow, are very timid, and do not defend their web so their bites are rare.

ADDITIONAL INFORMATION:

Eliminating spiders around homes and buildings, http://www2.ca.uky.edu/entomology/entfacts/ef623.asp

Common spiders in and around homes,
http://labs.russell.wisc.edu/insectid/files/2014/03/ControllingSpidersinandAroundHomes.pdf

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Stinging Insects

TARGET PEST	
TARGET PEST(S)	Bees, wasps, and yellow jackets
TARGET SITES(S)	Outdoors
PURPOSE	• Control stinging insects that can cause painful stings, massive envenomization, or serious allergic reactions. • Remove bee hives that can cause property damage and attract other unwanted pests.
RESPONSIBILITY	• Installation Preventive Medicine Technicians: Evaluate medical threat of stinging insects if necessary • Pest Management Service Provider: Conduct inspections and integrated pest management to control infestations through killing or removal. Arrange for removal of beehives in buildings. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider and Grounds Maintenance Provider: Report any stinging insect nest sightings.
SURVEILLANCE	
METHODS	• Observation of insect nesting or swarming. • Routinely examine buildings for openings where bees or other stinging insects appear to be entering and exiting. • Personnel complaints: including information on when pests were observed, where, and how many. • Identify whether bees are swarming or nesting. (see remarks below)
FREQUENCY	As observed by personnel.
ACTION THRESHOLD	• Nesting bees, wasps, or yellow jackets near populated areas require immediate response. • Swarming bees, especially near areas where few people are found, should be left alone. • Swarming bees in areas that cannot be avoided by people and appear to be a threat should be controlled. • Individual bees are foraging and are docile, but may be nesting nearby.
NONCHEMICAL CONTROL	

DISCOURAGE AND ELIMINATE NESTS	Nests should be removed by trained personnel
AVOIDANCE	Stay away from stinging insects if possible.
ELIMINATE FOOD SOURCES	• Keep pet foods indoors. • Cover trash cans.
ELIMINATE STANDING WATER	• Some stinging insects are attracted to water. • Repair leaking outdoor faucets and other mechanical water sources. • Eliminate standing water.
TRAPS	• Wasps and yellow jackets: o Trapping should start in the spring and be continued through the summer. Early elimination of queen will reduce the size of populations later in the year. o Lure traps—baited with a chemical attractant or with meat. o Water traps—Meat hung on a string hung 1-2 inches over a bucket of soapy water. Cover bucket with mesh to exclude other animals. • Bees: Swarming bees can be lured into a trap that mimics a nesting site.
MECHANICAL REMOVAL	Wet/dry vacuums may be used to remove bees, but should only be done by trained personnel.
PEST PROOFING	• Seal holes in exterior walls of buildings. Request support from facilities maintenance provider if necessary. • Remove debris that can serve as nesting areas. • Cover tree holes.
CHEMICAL CONTROL	
METHOD OF DISPERSAL	• Aerosol knockdown agents: High pressure aerosols that can be applied from a long distance can be used. Application of these insecticides results in a rapid knockdown of the insects. • Dusts: Dusts can be applied to nesting areas. • Baits: Baits mixed with a toxicant can be used for wasps and yellow jackets
CONSIDERATIONS	
SENSITIVE AREAS	• Personnel that may be harmed by bees or pesticide application. • Buildings that may be damaged by hives. • Ensure that insecticides do not enter drains, streams, lakes and other surface water.

NOTES REGARDING AFRICANIZED HONEY BEES (AHB):

Africanized Honey Bees (AHBs), or killer bees have colonized most of the southwestern United States. Most feral colonies of bees are considered to be AHB colonies.

AHB are often mistaken to be more venomous than their European counterparts that are raised for honey production and pollination. The venom that AHB produce is not more toxic. In fact, AHBs inject less venom than EHBs because they are smaller. AHB are more dangerous than EHB because they exhibit a more aggressive response to a disturbance of their nest or colony. An “attack” usually involves a large number of bees resulting in a large number of stings; often ranging into the hundreds. Injuries in these

types of attacks are the result of massive envenomation. Massive envenomation for small children, elderly and disabled persons and pets can be very serious and sometimes fatal.

Precautions that should be taken when dealing with any feral bee colony include:

1. Hiring a professional pest controller to kill or remove the bees.

2. Be aware of hives in the area. AHB are easily disturbed by loud noises or vibrations caused by lawn mowers and other machinery.

3. Warn people not to disturb hives or swarming bees.

4. Do not leave pets tied up in areas where they may be attacked by bees.

5. If attacked by bees, run and/or cover yourself up with a coat or heavy blanket or seek shelter in a building or a car immediately. Do not stop to swat at the bees or jump into water.

6. Call 911 or other emergency phone number in the event of an aggressive bee attack on a human.

Refer to Technical Information Memorandum (TIM) 34 "Bee Resource Manual with Emphasis on the Africanized Honey Bee" or view TIM 34 on the Department of Defense Armed Forces Pest Management Board web site at http://www.uscg.mil/mlclant/Kdiv/Envrn%20Hlth/IPM/AFPMB%20TIMs/tim-34.pdf

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Ticks

TARGET PEST	
TARGET PESTS	Ticks
TARGET SITES(S)	Outdoors, especially near or in wooded areas
PURPOSE	Prevent the spread of tick-borne diseases.

RESPONSIBLE PARTY	• Pest Management Service Provider: Pesticide applications.
	• Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications.
	• Installation Preventive Medicine Technicians (PMT):
	  o Conduct surveys when pests pose a health threat.
	  o Identify any collected ticks
	  o Contact point for disease emergencies
	  o Respond to complaints of tick bites.
	• Environmental Division: Recommendations and approval for land modifications near improved areas to eliminate tick harborage
	• Grounds Maintenance Provider: Vegetation removal.

SURVEILLANCE	
METHODS	• Cloth drag surveys (conducted by PMTs) • CO_2 ground traps (conducted by PMTs) • Customer complaints
FREQUENCY	When notified of a potential problem.
ACTION THRESHOLD	• 5 or more adult vector species captured in a 5 minute drag near training or encampment areas • During disease emergencies declared, one or more adults or nymphs that have been identified as carrying the disease within 5 miles of base NOTE: Action thresholds can be changed on advice of a BUMED entomologist

Vector species of concern	Primary diseases of concern
Dermacentor variabilis	Rocky mountain spotted fever (RMSF)
Ixodes scapularis	Lyme Disease
Amblyomma americanum	Ehrlichiosis

NONCHEMICAL CONTROL	
HABITAT MODIFICATION	Eliminate brush and high grass from improved and high traffic area
CHEMICAL CONTROL	
METHOD OF DISPERSAL	Barrier spray: Vegetation surrounding training areas and encampments may be sprayed with a pesticide that leaves a residual barrier to ticks. Dispersal is accomplished via a truck mounted power sprayer.

STRUCTURAL PESTS

Drywood Termites

Subterranean Termites

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Drywood Termites

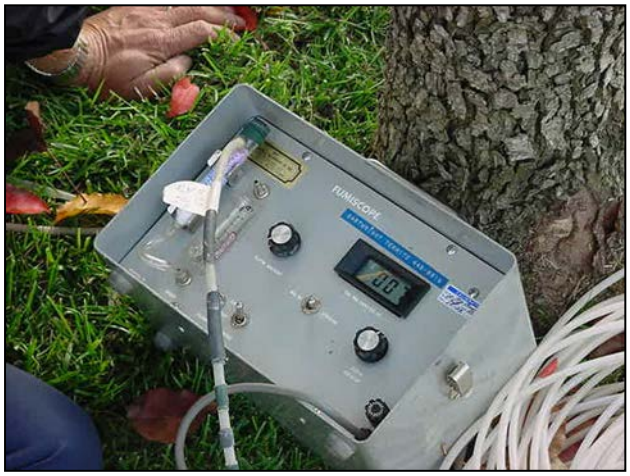
TARGET PEST	
TARGET PEST(S)	Several species of termites in the family Kalotermitidae, particularly *Incisitermes minor*.
TARGET SITES(S)	Structures containing wood
PURPOSE	Control termites that reduce the aesthetics and integrity of real property
RESPONSIBILITY	• All Personnel: Report termite damage and signs to the Pest Management Coordinator. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications.
SURVEILLANCE	
METHODS	Visual inspections • Inspect wood in crawl spaces that is touching or near the soil surface. • Pay particular attention to wood that is damp. • Termite galleries will be filled with excrement and other debris. • Infested wood may be discolored (darkened) and can often be easily punctured by a knife or screwdriver. • The surface of a severely damaged piece of wood may appear blistered or peeled.
FREQUENCY	Annually
ACTION THRESHOLD	Presence of termites indicates a need for treatment.
NONCHEMICAL CONTROL	
SANITATION	Remove scrap and decaying wood from yards.
HEATING	• Items that may be damaged by high temperatures are removed from the building. • Building is then tented using nylon tarpaulins, and propane heater is used to pump hot air into and around the building, bringing the temperature of all parts of the structure to 120°F or 35 minutes.

	• Temperatures as high as 130°F for 50 minutes may be used.
FREEZING	• Liquid nitrogen is pumped into infested areas. • Termites are killed by the extreme cold.
MICROWAVES	• Microwave generators are placed against walls and structures to be treated. • The resulting heat kills termites.
ELECTRICITY	• Electro-gun is used to apply low-amperage, high voltage current to infested wood. • Termites are killed by the electrical shock.
EDUCATION	• Water-damaged wood is attractive to termites and residents and GMPs should be educated on avoiding landscape irrigations that cause water to contact wood. • Recognition of termite infestations • Flying termites near buildings do not necessarily indicate an infestation; they are attracted to light.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Sulfuryl fluoride (Vikane) fumigant, borates
METHOD OF DISPERSAL	Borate dust or liquid application for spot treatment or wood protection Chemical fumigation
RESTRICTIONS/ REGULATIONS/ PERMITS	Sulfuryl fluoride is a restricted-use pesticide.
CONSIDERATIONS	
SENSITIVE AREAS	Gases used for fumigation are potentially lethal to humans. A 24-hour guard should be posted outside to ensure that no people enter the building before it has been cleared for re-entry by the pest management service provider.
PROHIBITED PRACTICES	Do not use of ultrasonic pest repelling devices.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Whole structure fumigation is a dangerous operation. DOD-specific safety requirements are required including securing doors, warning signs on building and on tarp, a barrier with warning signs, and contractor personnel on-site during the duration of the fumigations. • Impact minimal. Sulfuryl fluoride dissipates into the air rapidly and does not leave a residual. Borates are low toxicity for non-target animals, but contamination of water should be avoided.

COMMENTS:

Navy policy is to spot-treat unless infestations are spread throughout the structure. Fumigation is expensive and not cost-effective to use on limited infestations. Though several treatment options exist for drywood termites (see NONCHEMICAL CONTROL), chemical fumigation is by far the most common and currently the most effective method of control. Nonchemical control methods may be indicated in certain situations, such as highly-localized infestations or infestations in very large buildings where the logistics and cost of fumigation are prohibitive. Some of these methods may cause structural damage. Any termite treatment should include a warranty that includes follow-up inspections.

Note that pre- or post-construction soil treatments are not effective in preventing drywood termite infestations. Inspections are critical to the success of drywood termite control to identify where infestations exist and the extent of the infestations. Post-treatment inspections are critical to ensuring effectiveness of the treatment. Consult with the NAVFAC pest management consultant about specific situations where nonchemical control methods may be indicated.



Fumiscope for monitoring fumigant gas in structure.


Drywood termite damage.

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Subterranean Termites

TARGET PEST	
TARGET PEST(S)	Several species of termites in the family Rhinotermitidae, particularly the western subterranean termite, *Reticulitermes hesperus*
TARGET SITES(S)	Structures containing wood
PURPOSE	Control termites that reduce the aesthetics and integrity of real property.
RESPONSIBILITY	• All Personnel: Report termite damage and signs to the Pest Management Coordinator. • Pest Management Service Provider (PMSP): Conduct integrated pest management to control infestations. • Facilities Maintenance Provider (FMP): Provide facility repairs and modifications needed for termite exclusion. • Pest Management Performance Assessment Representative (PMPAR): Ensure contractor pest management service provider performs work in accordance with contract specifications.
SURVEILLANCE	
METHODS	• Inspect wood that is touching or near the soil surface. • Pay particular attention to wood that is damp • Look for shelter tubes in crawl spaces and in walls. • Termite galleries will be filled with excrement and other debris • Infested wood may be discolored (darkened) and can often be easily punctured by a knife or screwdriver. • The surface of a severely damaged piece of wood may appear blistered or peeled.
FREQUENCY	• Annually in most regions • Biannually in arid regions
ACTION THRESHOLD	Presence of termites indicates a need for treatment

NONCHEMICAL CONTROL	
BUILDING DESIGN AND MAINTENANCE	• Several design and construction techniques can help prevent subterranean termite infestations o Use wood species that are resistant to termite attack o Keep all wooden components at least 12-inches above the surface of the soil o Replace soil around the foundation of the building with sand (particle size ranging from 10 to 16 mesh) o Provide adequate ventilation in crawl spaces to keep wood dry. o Before pouring slab, install termite-resistant mesh and eliminate openings around plumbing and other utilities protruding from slab. • Reduce excess moisture in the building by correcting leaky plumbing and moisture associated with air conditioning condensate
PEST PROOFING	• Use screening over vents and other openings to discourage entry by winged reproductives. • Remove scrap wood from around structures.
SAND BARRIER	Replace soil around foundation and in crawl spaces with sand. Sand particles should be 10 to 16 mesh. Termites are unable to tunnel through sand.
EDUCATION	Difference between a winged ant and a termite swarmer.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Fipronil, sulfuramid., diflubenzuron, hydramethylnon, chlorantraniliprole, and others.
METHOD OF DISPERSAL	• Chemically Treated Lumber: Lumber to be used near the soil surface is impregnated (pressure treated) with a variety of repellent/fungicidal/insecticidal chemicals prior to construction. Some of these products are also available to topical application to wood after construction. These products are not effective for controlling pre-existing termite infestations. • Pre-Construction Soil Treatment: The soil under and around the perimeter of a slab is treated with an insecticide prior to construction. The insecticide acts as a barrier, either by killing termites that contact the treated soil or repelling foraging termites. Only non-repellent termiticides should be used. • Soil Insecticide Injection: This is the most common method for controlling termites if a pre-construction chemical barrier fails or was never applied. Holes are drilled through the foundation of the building, and insecticides are injected into the soil. Insecticides will kill termites already infesting the building and prevent future infestations for several years. A licensed professional is recommended; applying pesticide to the wrong place can cause contamination in the pluming or heating ducts. • Baits: Bait stations containing a slow acting insecticide are placed around the building. Termites feed on the bait, and then return to the colony where they share the bait with other members of the colony. Some baits are available to the general public whereas others are available only to licensed pest management personnel. Proper bait placement is critical to the success of the procedure, and is therefore best performed by pest management personnel with experience in termite baiting.

CONSIDERATIONS	
SENSITIVE AREAS	• If properly applied, insecticide pre-treatments and injections should pose little risk of unwanted insecticide exposure. • Bait stations should be placed to minimize the chances that children or facilities maintenance personnel will disturb them. • Ensure that insecticides do not enter drains, streams, lakes and other surface water.
PROHIBITED PRACTICES	Do not use ultrasonic pest repelling devices.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Applicators must use personal protective equipment as required by the product label. • Termiticides leave a long residual in soil. Care must be taken when applying to prevent contamination of non-target areas.

ADDITIONAL INFORMATION:

Formosan Subterranean Termites

Formosan subterranean termites (FST) are a more destructive species of termite due to its colony size and foraging range. A single FST colony can contain several million termites compared to several hundred thousand for the native subterranean termite species. FST species share interconnected forage galleries in the soil and can forage up to 300 ft, posing a threat to nearby structures. Their distribution includes the southeastern United States and Hawaii. Other differences between an FST colony and a native subterranean colony include:

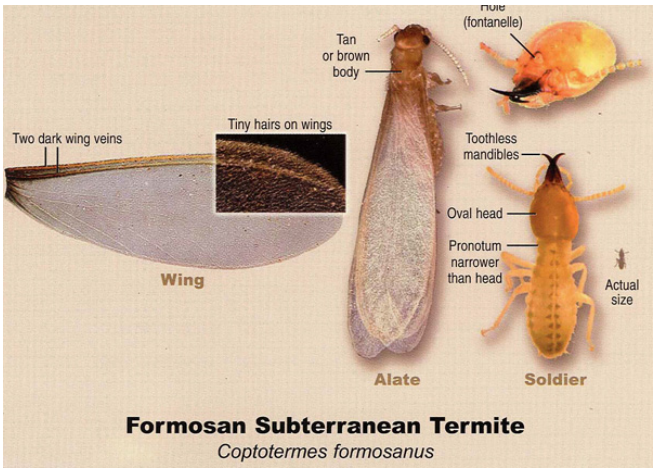
1. FST colonies contain more termite soldiers (have a hardened head capsule) in the colony (10–15% compared to 1–2%) and swarmers are larger

2. They form a material called “carton” in structure voids which allows them to obtain moisture without returning to ground (photo on right).

3. They can readily form aerial colonies by going the top of the structure to obtain moisture which makes controlling them difficult or impossible.

A more aggressive treatment program for FST colonies is required, using the same treatment options as above. Any cartons in voids should be located and removed.

Subterranean termite shelter tubes.



TURF AND ORNAMENTAL PESTS

Fire Ants

Ornamental Plant Pests

Snails and Slugs

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Fire Ants

TARGET PEST	
TARGET PEST(S)	Fire ants
TARGET SITE(S)	Outdoors and inside buildings
PURPOSE	Control fire ants that can cause painful stings or allergic reactions, be a nuisance, and short circuit electrical circuits.
RESPONSIBILITY	• Pest Management Service Provider: Respond to trouble calls and conduct routine inspections during seasonal outbreaks. Thorough inspections will be made prior to any control operation. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Grounds Maintenance Provider: Control aphids and similar insects on ornamental plants that attract and feed ants. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested.
SURVEILLANCE	
METHODS	• Visual inspections o Observation of foraging scout ants; ants aggressive when mound is disturbed o Aboveground mounds • Personnel complaints: including information on when, where, and how many pests were observed.
FREQUENCY	• As needed • Areas designated by customer complaints, or with a history of infestation.
ACTION THRESHOLD	Visual sighting of fire ants.
NONCHEMICAL CONTROL	
SANITATION	• Remove indoor plants which are attractive to ants and/or aphids • Trim trees and shrubs touching buildings
OUTSIDE BARRIER	• Keep a vegetation-free, clear area approx. 24” wide (often filled with gravel or coarse sand) around foundations to inhibit pest movement to structures and facilitate barrier treatments.
PEST PROOFING	• Reduce moisture • Replace outside hollow core doors with solid doors.

CONTROL OF PLANT INSECTS	• Ants live in cooperation with some plant-infesting insects such as aphids. These insects produce sugars that are food for the ants, while the ants provide protection for the plant-sucking insects. • Control aphids and other plant-sucking insects on plants
CHEMICAL CONTROL	
METHOD OF DISPERSAL	• Baits: Improved areas should be treated with a granular bait annually in the late summer or early fall. Bails are slow-acting and require weeks to months to achieve 80 to 90% control. • Drench, Dust, or Granular Insecticide: Three to five days after initial broadcast application, specific nuisance mounds should be treated with a drench, dust, or granular application labeled for fire ant mounds. Nuisance mounds are those located in sensitive or high traffic areas.
CONSIDERATIONS	
SENSITIVE AREAS	• Exposed food products, food containers, counter tops, any surface where food may be stored or prepared, or any food storage area. • Outdoors where children or pets may be exposed to pesticides.
PROHIBITED PRACTICES	• Do not apply liquid or dust formulations of insecticides in occupied spaces. • Do not do preventive baseboard spraying in the absence of a pest.
SAFETY PRECAUTIONS	• Treatment of child development centers and schools will be scheduled at night of the last day during the work week if practical. Pesticides will be allowed to dry and air out for at least 36 hours before children are allowed to enter treated spaces. • Additional re-entry interval time requirements specified by the product label must be strictly adhered to. • If a liquid, dust, or aerosol is used, treatments will be made after hours or at other times when the spaces are vacant.

COMMENTS:

Baits should not be applied if heavy rains are expected within 24 hours. Baits work best when they are fresh and are applied when ants are foraging, usually in the late afternoon and evening.

NOTES REGARDING FIRE ANTS:

The red imported fire ant (RIFA) is a very destructive pest that is well established along the southern tier of the United States. These ants are reddish brown and 1/8" to 1/4" long. RIFA nests are generally constructed in open, sunny areas such as lawns and around yard plants and trees. These ants can invade utility vaults and structures. The sting from the RIFA is very painful and, in certain cases, may require medical attention. Never use gasoline to burn out any ant nest. Gasoline is a soil and groundwater contaminant, and is very hazardous. For more information on red imported fire ants, contact your pest control service provider or go to http://fireant.tamu.edu/.

Ornamental Plant Pests

TARGET PEST	
TARGET PEST(S)	Insects and mites attacking ornamental plants
TARGET SITES(S)	All interior and exterior areas with ornamental plants
PURPOSE	• Prevent damage to real property (valuable ornamental plants) • Prevent unsightly honeydew and mold accumulation on vehicles and structures
RESPONSIBILITY	• All Personnel: properly care for houseplants in working areas • Pest Management Service Provider: conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: ensure contractor pest management service provider performs work in accordance with contract specifications • Grounds Maintenance Provider: maintain the health of ornamental plants • Landscape Designer: ensure use of plants well adapted for the given areas in landscaping; ensure placement of plants in areas where their health can be maintained • Integrated Pest Management Consultant: identify unknown pests and recommend control measures.
SURVEILLANCE	
METHODS	• Visual sighting of pests: o Caterpillars: immature forms of moths and butterflies. These insects chew on leaves and are often found on the undersides of leaves. o Aphids: small (usually about 1/16-inch or smaller) globular, pear-shaped insects. Color is usually green, but may be pink, yellow, blue-green, or black. Almost always with two dorsal tubular structures on the posterior end of the body (cornicles). Wingless and winged forms may be present. Typically found on the undersides of leaves, but may also be present on stems. o Scales: flattened sessile insects that suck plant juices from leaves or, more often, stems. Usually appear as oval, waxy shells; no legs or body divisions are visible. Size and color vary depending on age and species. o Mealybugs: oval insects that superficially resemble small sowbugs. Exude loose cottony wax that may obscure the body of the insect. May be found on almost any part of the host plant, including the roots. o Whiteflies: adults usually appear as minute white flies that hold their wings roof-like over their bodies at rest (though these insects are not true flies). Dark spots or patterns are visible on the wings of some species.

	Adults typically rest on the undersides of leaves, but fly readily if disturbed. Immature whiteflies are sessile, flattened, oval insects that are almost always found on the undersides of leaves. They suck plant juices and can severely reduce plant vigor. o Mites: minute, globular arachnids very diverse in habit and form. Some are pests of plants. Adult mites will have eight legs, distinguishing them from insects which have six legs. Spider mites are the most common mite pests of ornamentals. Immature spider mites are usually yellowish or straw-colored and the adults are yellowish or green. In severe infestations, a fine web, similar to spider web will coat the plant's foliage. Bright red, fast moving, velvety mites are often present on plant foliage. These mites are predaceous and, therefore, considered beneficial. o Nematodes: microscopic, eel-like roundworms. Many species are root-feeding. They are difficult to control and can be easily spread from garden to garden on tools, in soil, or on boots. o Other pests: other insects, including cicadas, psyllids, leaf-feeding beetles, and gall-forming insects may be pests of ornamentals. Contact a pest management consultant if unsure of the identity of a pest. • Signs of pest infestation: o Leaves: chewed, spotted, curled, or otherwise disfigured leaves can indicate an insect or mite infestation. Plant pathogens, nutrient imbalances, and uptake of toxic substances can cause similar disfigurements of leaves. Consult with the pest management consultant when in doubt of the origin of plant damage. o Branches: girdled twigs are an indication of infestation by certain types of beetles. o Trunks: holes in the trunk or globules of plant resin can indicate infestation by certain types of boring beetles. o Ants: ants scurrying about the foliage of a plant may be a sign of infestation by certain plant feeding insects, especially scales, aphids, and mealybugs. These insects exude sugary waste products that ants feed upon. In return, the ants protect the plant feeding insects from predators and parasites.
FREQUENCY	Ornamental plants should be inspected weekly for pests or signs of pests.
ACTION THRESHOLD	Variable, depending on pest. A low-level of infestation is to be expected on outdoor plants. Natural controls (predators, parasites, and plant defenses) typically prevent these low-level infestations from significantly harming the plant. Infestations that significantly reduce plant health or seriously affect plant aesthetics are candidates for chemical control. Unnecessary or excessive pesticide application can compromise natural control by killing beneficial organisms and may lead to pesticide resistance.
NONCHEMICAL CONTROL	
BIOLOGICAL CONTROL	• Bti: Several formulations of the bacterial agent, *Bacillus thuringiensis israelensis* are available for use against certain pests, particularly caterpillars. • Fungi: some fungal pathogens of insects have been isolated and formulated for use against insect pests. • Natural control: Many pests of ornamentals are maintained at low, undamaging levels by the actions of natural enemies. Applying chemical pesticides only when necessary can help conserve these natural enemies. In some cases, universities and government agencies may be actively importing, rearing, and releasing natural enemies for control of particular pests.

SANITATION	• Removing, burning, or chipping dead wood and other plant debris can reduce certain pest populations, particularly beetles. • Keep gardening tools clean so as not to carry pests from one plant to the next. • Only buy plants from reputable sources. Ensure that plants don't harbor ants, nematodes, invasive weeds, or other problems.
MECHANICAL REMOVAL	• Minor infestations: simply picking pests off of plants can sometimes control small infestations. This technique is typically not practical for large infestations or infestations on outdoor landscaping. • Severe infestations: in some cases, a plant may be so severely infested that there is little chance of control, or the cost of control is not justified by the value of the plant. These plants should be removed, and their tissues destroyed (chipping or burning) so that they do not serve as a source of pests for other plants.
IMPROVE AND MAINTAIN PLANT HEALTH	• The best defense against pest infestations is maintenance of healthy, vigorous plants. Healthy plants will be able to tolerate low levels of infestation and prevent pest outbreaks. • Ensure proper watering, fertilizing, and pruning schedules. Do not over water or over fertilize. • Place plants in areas where they receive the appropriate quality and quantity of light.
USE OF NATIVE VEGETATION LANDSCAPING	• Native plants are usually less susceptible to pests because they are well adapted to survival in the area. Consider using native vegetation rather than exotic vegetation in landscape design. • Grow a diversity of plants. Plant a variety of sequentially flowering species to provide natural enemies with nectar, pollen, and shelter throughout the growing season.
EDUCATION	Education on natural enemies
CURRENT NONCHEMICAL CONTROL PRACTICES	Maintain health of ornamental plants through proper watering and pruning.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	• A number of soap and oil insecticides are available. Many of these are "25(b)" or EPA minimum-risk pesticides and are exempt from registration due to the low toxicity of the active and inactive ingredients in the product. For a list of these active ingredients, go to http://www.epa.gov/oppbppd1/biopesticides/regtools/25b_list.htm.
METHOD OF DISPERSAL	• Contact pesticides: may be sprayed directly onto infested plants. The pesticide must directly contact the pest for control. The applicator should concentrate on the undersides of leaves for most types of pests. Insecticidal soaps are a particular class of contact pesticide with very low toxicity to nontarget organisms. These can be particularly effective against some scale, mealybug, and mite infestations. • Systemic pesticides: these chemicals are absorbed by the plant and ingested by the pest when it feeds on the plant. Some systemics are applied to the foliage; others are applied to the soil and absorbed by the plant's roots.
SENSITIVE AREAS	• Use nonchemical controls whenever possible around playgrounds and childcare centers. • Avoid exposing natural areas containing endangered or threatened species. • Ensure insecticides do not enter drains, streams, lakes and other surface water.

RESTRICTIONS/ REGULATIONS/ PERMITS	None.
CONSIDERATIONS	
PROHIBITED PRACTICES	Do not use ultrasonic pest-repelling devices.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Applicators must use personal protective equipment as required by the product label. • Take precautions to prevent pesticide exposure to personnel when spraying near buildings or other populated areas. • Avoid contaminating water. Do not apply before rain or irrigation to prevent runoff.

Snails and Slugs

TARGET PEST	
TARGET PEST(S)	Snails and slugs, particularly the brown garden snail (*Helix aspersa*) and the gray garden slug (*Peroceras reticulatum*), the banded slug (*Limax poirieri*), and the greenhouse slug (*Milax gagates*)
TARGET SITES(S)	Landscaped areas around buildings
PURPOSE	• Prevent damage to real property (landscaping plants) • Reduce the presence of unsightly snails and slugs on and around buildings
RESPONSIBILITY	• Pest Management Service Provider: conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative (PMPAR): ensure contractor pest management service provider performs work in accordance with contract specifications. • Landscape Maintenance Provider: maintain the health of ornamental plants.
SURVEILLANCE	
METHODS	• Visual sighting of pests: o Snails: conspicuous, shelled slow moving animals found in moist habitats. Most active at night and on cloudy or foggy days. During hot dry periods, dormant snails may be seen attached to walls, fences, or tree trunks. o Slugs: similar to snails, but without shell • Signs of pest infestation: o Trails: snails and slugs leave silvery mucus trails wherever they crawl. Trails may be present on the ground, on the foliage of plants, or on buildings. o Plant damage: chew irregular holes with smooth edges in leaves of succulent and herbaceous plants. Prefer plants that are close to the ground, but will climb to feed on fruits and leaves of fruit trees.
FREQUENCY	Survey during normal landscape maintenance
ACTION THRESHOLD	Populations densities sufficient to cause a nuisance or significant damage to plants warrants control
NONCHEMICAL CONTROL	
BIOLOGICAL CONTROL	• Decollate snail: a predaceous snail that feeds on young plant feeding snails and slugs. These snails pose a risk to endangered native snail populations, so their release is restricted to particular counties. They are not commercially available.

DRIP IRRIGATION	• Replacing sprinklers with drip irrigation will reduce unnecessary moisture and therefore reduce the habitat for snails and slugs to hide
HABITAT REMOVAL	Remove debris, such as boards, flat stones, dead vegetation, and low hanging limbs that provide moist cover for snails and slugs during dry periods.
MECHANICAL REMOVAL	• Picking: snails and slugs can be picked out of landscaped areas, placed in plastic bags, and disposed of in refuse containers. This method is not likely to be practical in large landscaped areas • Trapping: a board with two rails on opposite edges will serve as an attractive site for snails and slugs to hide during dry periods. The board can be periodically lifted and the snails and slugs removed.
PEST PROOFING	Barriers: consist of copper foil or screens. Copper foil can be wrapped around the bases of potted plants. Copper screen can be used to create barriers around gardens and landscaped areas.
IMPROVE PLANT VIGOR	Healthy plants will be less likely to succumb to damage by pests.
CHEMICAL CONTROL	
METHOD OF DISPERSAL	Baits: products containing metaldehyde or iron phosphate are effective for slug and snail control. Apply baits in the evening. Baits applied during hot dry conditions are less likely to be effective because snails and slugs will be inactive and therefore less likely to come in contact with the bait. **Note:** Do not use salt to kill snails and slugs. This will damage the soil and render it unusable for landscaping or gardening.
CONSIDERATIONS	
SENSITIVE AREAS	Products containing metaldehyde can be hazardous to children or pets. Emphasize nonchemical control and iron phosphate baits in areas frequented by children or pets.
PROHIBITED PRACTICES	Do not use ultrasonic pest repelling devices.

VERTEBRATE PESTS

Bats

Nuisance Birds

Feral Cats

Raccoons

Rodents

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Bats

TARGET PEST	
TARGET PEST(S)	Bats
TARGET SITES(S)	Buildings where bats may roost
PURPOSE	• Prevent damage to real property and unsanitary conditions resulting from the buildup of bat guano (feces) • Prevent fear • Reduce the risk of disease transmission from infected bats • May be a source of bat bugs, which are in the same genus as bed bugs
RESPONSIBILITY	• Installation Preventive Medicine Technicians: Conduct surveys if bats pose a health hazard and provide pest management recommendations. • Pest Management Service Provider: Conduct integrated pest management to control bats in structures when necessary. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Natural Resources: Implement a bat management plan developed by the contracted biological consultant and conduct bat removal from workspaces. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested. • All Personnel: Report bat problems, especially when they pose a health hazard.
SURVEILLANCE	
METHODS	• Visual inspections o Observation of bats roosting or entering a building. o Observation of signs of bat roosting such as guano • Personnel complaints: including information on when, where, and how many pests were observed.
FREQUENCY	Daily observation by all personnel and pest management service providers.
ACTION THRESHOLD	• When bats pose a health hazard, become a nuisance, or deface property. • Bats in human living quarters or food preparation areas should always be removed.
NONCHEMICAL CONTROL	
EXCLUSION	Seal openings to attics and other areas where bats may enter and roost

BAT REMOVAL	• One-way valves: Devices that allow bats to leave a building, but not return, can be installed on buildings already infested. Leave such devices in place for 7 to 10 days before permanentaly sealing the opening. • Do not install devices on roosts where mothers are nursing immature bats.
MECHANICAL REMOVAL	Bats that accidentally enter a room can be captured and released outside. To reduce stress on the animal, use the following procedure: 1. Close doors to confine the bat to a single room. 2. Allow the bat to become exhausted and land. Do not attempt to catch a bat in flight. 3. Once the bat has landed (usually on curtains or a piece of furniture), allow it to rest for 20 to 30 minutes. 4. Place a bowl, can, or other suitable container over the bat. 5. Trap the bat in the container by sliding a piece of cardboard or other rigid material between the bat and the surface on which it is resting. Wear thick leather gloves for this procedure, and avoid touching the bat. 6. Release the bat outside. The bat may not fly immediately, so release it in an area where it can remain undisturbed for several hours. If the bat is still present the next day, report it to a preventive medicine technician or pest control service provider.
PROVIDE ALTERNATIVE ROOSTS	Bat houses can provide an alternative to buildings as roosting sites. Houses must be correctly built and placed for acceptance by bats.
EDUCATION	Public education on both the benefits and the risks associated with bats.
CONSIDERATIONS	
PROHIBITED PRACTICES	Do not use ultrasonic pest repelling devices.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Use care when handling bats and wear proper PPE when necessary. • Contact the natural resources manager for restrictions and guidance on bat management.

CHEMICAL CONTROL:

There are no chemical pesticides registered for use against bats. Deliberately poisoning bats or other wildlife is a violation of federal law.

COMMENTS:

Bats are generally considered beneficial organisms that reduce insect populations. Control is only necessary if the bats are causing a nuisance or public health concern.

ADDITIONAL INFORMATION:

How to build and place bat houses and bat eviction devices can be found at http://www.batcon.org/.

Nuisance Birds

TARGET PEST AND SURVEY	
TARGET PEST(S)	Nuisance birds (including pigeons, English sparrows, starlings, seagulls, etc.)
TARGET SITES(S)	• Office buildings, warehouses, aircraft hangars, and parking lots • Light posts and signs • Ledges, window ledges, and rooftops
PURPOSE	Manage birds that cause safety hazards (Bird/Wildlife Aircraft Strike Hazard), deface buildings, vehicles, and equipment, and provide a potential source of disease, mites, and bed bugs. Bird droppings which accumulate over several years may harbor spores of fungus that cause histoplasmosis, ornithosis, and cryptococcosis.
RESPONSIBILITY	• Installation Preventive Medicine Technicians: Conduct surveys if birds pose a health hazard and provide pest management recommendations. • Pest Management Service Provider: Conduct integrated pest management to control birds. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested. • BASH Manager: Manage birds in and around airfields and aircraft facilities to prevent bird aircraft strike hazards (BASH). • Natural Resource Manager: Coordinate management of birds and other wildlife with USDA Wildlife Services and be the POC for depredation permits. • All Personnel: o Report bird problems especially when they pose a health hazard. o Do not feed pest birds (except for residential bird feeders) o Keep lids closed on dumpsters and other receptacles
SURVEILLANCE	
METHODS	• Visual inspections o Observation of birds roosting or nesting or entering into a building o Observation of signs of bird roosting and nesting such as feces o Observation of bird mites in buildings infested with birds. • Personnel complaints: including information on when, where, and how many pests were observed.
FREQUENCY	Daily observation by all personnel and pest management service providers.

ACTION THRESHOLD	When birds pose a health hazard, become a nuisance, or deface property.
NONCHEMICAL CONTROL	
REMOVAL OF FOOD SOURCES	• Cover trashcans and dumpsters which attract birds such as gulls • Avoid feeding birds especially pigeons • Sanitation
EXCLUDE ENTRY INTO BUILDINGS	• Close windows and doors to buildings • Place netting over windows and doors that must remain open • Place wood, metal, glass, masonry, rust-proofed wire mesh (1/4" thick), or plastic/nylon screen/netting or other barriers over openings or areas of buildings that might be used for nesting
ELIMINATE ROOSTING	• Design structures that prevent bird roosting. For example, place a board over ledges at a 45° angle. Make sure the ends are closed to prevent entry. • Remove structures that allow roosting. • Attach anti-roosting devices such as Nixalite bird strips • Apply a chemical repellent such as Hot Foot. • Thinning or pruning trees to remove protective cover can discourage roosting.
SHOOTING	• If allowed, a low-caliber rifle can be used indoors to eliminate birds. • Outdoors, shotgun blasts can also scare birds. • This method should only be used by personnel trained in the use of firearms. There are tight restrictions on bringing firearms onto an installation.
HABITAT MODIFICATION	Modify habitats to make them less attractive to birds (especially around airfields) • Keep grass low • Fill in areas that hold water
TRAPPING	• Pigeon traps have proven to be effective in some situations. • "Australian crow traps" collect a wide variety of birds, but may require a permit to use. • Pigeons should not be relocated as they will likely return to their roosting and feeding areas. They may need to be euthanized.
NEST REMOVAL	• Remove bird nests. Nuisance bird nests can be removed with eggs or chicks. Other bird nests cannot be removed unless abandoned or empty. • Cliff swallows: remove mud nests while they are still under construction and do not contain eggs or hatchlings. Once the nest has been established, it is illegal to destroy the nest until it is abandoned.
SCARE DEVICES	• Acoustical devices, such as propane-fired cannons, are known as bird bangers. The cannons that work most effectively are those that randomly fire at different times and are multidirectional. It is the unpredictable nature of the noise that frightens the birds • Visual repellent devices such as scare-eye balloons, bird effigies, laser lights, and streamers and flashtape. • Timing is important. It is easier to scare birds if the site has been occupied for a short period of time rather than used for many nights. Scare tactics require at least three to five evenings to be effective. • Raptor Models—strategic placement of owl decoys or raptor silhouettes may be used to discourage roosting. Models must be relocated frequently and have only a short-term effectiveness. Both visual and auditory frightening devices are only effective for short periods of time.

EDUCATION	Understanding of how baits and repellents work Importance of not feeding birds and keeping trash receptacles closed.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	• 4-aminopyridine, polybutene, methyl anthranilate
METHOD OF DISPERSAL	• Bait: One type of chemically-treated bait causes birds that ingest the toxicant to emit distress and alarm cries and visual displays that frighten the rest of the flock causing them to leave the site. (e.g., Avitrol) • Chemical repellent: Chemical repellents are non-toxic to the birds and are available for direct application to turf and other surfaces where birds feed or roost. (e.g., 4 The Birds, Hot foot, Tanglefoot, Roost No More, Bird-Proof). Another application method available is a ULV formulation that is allowed to drift directly onto the birds (e.g., Fog Force).
RESTRICTIONS/REGULATIONS/PERMITS	• Nuisance birds are not protected under the Migratory Bird Treaty Act, but control of the birds may require a depredation permit. • The NRM should always be consulted when managing non-nuisance birds.
CONSIDERATIONS	
SENSITIVE AREAS	• Areas where endangered or threatened species occur. • The use of toxicant bait can elicit a negative public response. Public education, timing, and placement of the bait are important in preventing negative publicity.
PROHIBITED PRACTICES	Do not use ultrasonic pest repelling devices.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Firearms safety if shooting • Noise hazards with auditory scare devices. • Fall hazard when working on roofs or ledges • Adverse impact on non-target bird especially when using chemicals.

COMMENTS:

All birds except rock doves (pigeons), English sparrows, and starlings are protected under the Migratory Bird Treaty Act (MBTA) and require a depredation permit to control. This also includes nests occupied by birds protected by the MBTA. Contact the installation environmental division regarding a permit before beginning new bird control operations.

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Feral Cats

TARGET PEST	
TARGET PEST(S)	Feral Cats
TARGET SITES(S)	Buildings where cats frequent
PURPOSE	Control feral cats that may contribute to flea infestations, increase the risk of rabies and other diseases, and prey on local wildlife.
RESPONSIBILITY	• Army Veterinary Detachment: Conduct surveys if cats pose a health hazard and trap cats when necessary. • Pest Management Service Provider: Conduct integrated pest management to control cats near buildings when necessary. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested.
SURVEILLANCE	
METHODS	• Visual inspections • Customer complaints
FREQUENCY	Daily observation by all personnel.
ACTION THRESHOLD	• Any wild/feral animals capable of transmitting rabies and acting sick or aggressive, or damaging property shall be managed. • Any animal (capable of carrying rabies) that has bitten or scratched someone shall be managed and analyzed for rabies.
NONCHEMICAL CONTROL	
LIVE TRAPS	Cats that require extensive care will be taken to the local humane society or Society for the Prevention of Cruelty to Animals (SPCA), cats that are rejected by the SPCA will be euthanized.
SANITATION	• Remove food source • Cover trash cans/dumpsters
EDUCATION	Keep personnel from feeding the feral cat population.
HABITAT MANAGEMENT	Remove available harborage sites

COMMENTS:

Toxic baits shall not be used for feral cat management.

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Raccoons

TARGET PEST	
TARGET PEST(S)	Raccoons.
TARGET SITES(S)	Areas near buildings or populated areas where raccoons become a pest.
PURPOSE	Control raccoons due to danger when they are cornered and become aggressive, pathogens they carry such as rabies and raccoon roundworm which can be fatal to humans, and severe damage they cause to buildings and other structures.
RESPONSIBILTY	• Installation Preventive Medicine Technicians: Conduct surveys where raccoons pose an adverse health or safety risk, such as inside buildings • Pest Management Service Provider: Conduct integrated pest management to control raccoons. • Pest Management Performance Assessment Representative: Ensure contractor PMSP performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude raccoons from buildings. • Base Operation Support: Ensure that dumpsters and trashcans are emptied on schedule and that they are securely covered to prevent raccoon entry. • All Installation Personnel: Practice good sanitation and do not feed wild animals to prevent attracting raccoons from becoming a pest.
SURVEILLANCE	
METHODS	• Visual sighting of raccoons or signs of raccoons. • Raccoons are nocturnal, so visual surveys are usually conducted at night. • Verify personnel reports of raccoon activity.
FREQUENCY	As needed.
ACTION THRESHOLD	Any verified sighting of a raccoon where it enters a building or poses a safety or health hazard.
NONCHEMICAL CONTROL	
EXCLUSION	Use lids/covers that can be secured on dumpsters and trashcans.

SHOOTING	• Shooting with a .22 caliber rifle may be used to control small populations in areas where:
	  o shooting is legal
	  o shooting can be safely conducted
	• Qualified marksmen should do shooting.
	• Not generally practical for large populations

TRAPPING	• Live cage-type traps should be used • Use cat food containing fish or canned tuna for bait. To avoid catching cats use marshmallows, grapes, prunes, peanut butter, or sweet rolls. • Ensure that the raccoon cannot reach through the back or side of the trap to steal the bait. • Secure trap to the ground to prevent the raccoon from tipping it over.
FOOD REMOVAL	• Deny access to trash and other sources of food. • Prevent personnel from feeding raccoons.
CHEMICAL CONTROL	
Chemicals are not available for the control of raccoons.	
CONSIDERATIONS	
PROHIBITED PRACTICES	• Use of ultrasonic pest repelling devices is prohibited. • Relocation of trapped animals greater than one mile from point of capture is prohibited by State law.

ADDITIONAL INFORMATION:

Raccoon biology and management
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74116.html

Information on raccoon roundworm infection
http://www.cdc.gov/parasites/baylisascaris/index.html

Rodents

TARGET PEST	
TARGET PEST(S)	• Commensal: Norway rats, roof rats, house mice • Peridomestic: Field mice (e.g., deer mice) • Landscape: gophers, ground squirrels
TARGET SITES(S)	Buildings, utility vaults, other structures, and landscaped areas
PURPOSE	Control rodents that may cause food contamination, disease transmission, property damage or be a nuisance.
RESPONSIBILITY	• Building Occupants: Ensure sanitation and other measures to prevent introduction and propagation of pests. • Installation Preventive Medicine Technicians: o Conduct surveys where rodents pose an adverse health or safety risk o Provide informal quality assurance for pest control o Provide pest management and disease prevention recommendations. • Pest Management Service Provider: Conduct integrated pest management to control infestations. • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Facilities Maintenance Provider: Perform facilities repairs and improvements that exclude and minimize pest infestations as requested. • Grounds Maintenance Provider: Perform removal of potential food sources (e.g., fruit on trees) and creation of barriers (e.g., vegetation removal) around buildings that promote rodent invasion. • Natural Resource Manager: Provide guidance when rodent control operations may impact endangered or threatened species or species of concern.
SURVEILLANCE	
METHODS	• Visual inspections: observations of rodents or signs of rodents, such as nests, rub marks, gnawing, earth mounds, holes, etc. • Use of tracking powder • Personnel complaints: including information on when pests were observed, where, and how many. • Conduct pre- and post-treatment surveys to determine whether control operation was effective • Use of ultraviolet inspection lights (rodent urine and hair will fluoresce under UV light)
FREQUENCY	Daily observation by building occupants. Routine facilities inspections by cognizant PMT or pest control service provider.

ACTION THRESHOLD	Sighting of any rodent or sign of rodent in or immediately surrounding the building.
NONCHEMICAL CONTROL	
SANITATION	Remove or prevent access to all potential food and harborage sources inside and outside of buildings.
ELIMINATE STANDING WATER	Fix leaking plumbing around buildings
PEST PROOFING	• Trim ornamental plants and trees to prevent harborage. • Seal holes in exterior walls that may serve as entryways. • Trim tree limbs so that they are at least 6 feet from the building. • Trim vegetation around buildings. • Clean up debris from inside and around buildings. • Request support from facilities maintenance and/or grounds maintenance provider if necessary.
HABITAT DESTRUCTION	• For field mice: vegetation removal and disking of soil in a barrier 50 ft around buildings will prevent rodent invasion. This is usually done after area-wide rodenticide application. • Use of native landscaping will tend to reduce peridomestic and landscape rodent infestations. Avoid heavy ground covers that provide harborage and cover for rodents to move into buildings from unimproved grounds.
TRAPPING	Glue boards, snap traps, or other mechanical trapping devices. (see health precautions below)
EDUCATION	• Awareness of the importance of sanitation on preventing rodents. • Understanding and preventing diseases associated with rodents.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	• Second generation anti-coagulants: brodifacoum, bromadiolone, difenacoum, difethialone • First generation anti-coagulants: diphacinone, chlorophacinone, warfarin • Others: zinc phosphide, cholecalciferol, bromethalin • Fumigant: aluminum phosphide
METHOD OF DISPOSAL	• Anticoagulant bait: Multi or single dose blocks or pellets; toxicant effect is delayed. • Single dose acute toxicant bait: Acute toxicant effect; often broadcast outdoors on ground. • Liquid bait: Used in areas where water sources are scarce. o When used in occupied spaces or outdoors where there is a risk of exposure to humans and nontarget animals, the bait should be contained in a tamper-proof bait station. o Baits can be applied directly into burrows. • Fumigation: Used for control of rodents in burrows. Consult a NAVFAC pest management consultant if necessary.
RESTRICTIONS/ REGULATIONS/ PERMITS	All rodenticide baits are required to be applied in tamper-proof bait stations.

CONSIDERATIONS	
SENSITIVE AREAS	• Areas where humans and nontarget animals may come into contact with the rodenticide, particularly childcare centers. • Areas where endangered or threatened rodent species occur and may consume bait. • Areas where rodents may be primary food source for an endangered or threatened animal. • Habitat destruction to reduce food sources or harborage may also be destructive to critical habitats of endangered or threatened species. • The pest management coordinator shall consult the environmental compliance office before any pest management operations are conducted outdoors on unimproved grounds or wildlands.
PROHIBITED ITEMS	• Do not use ultrasonic pest repelling devices. • Myth: Allowing cats to live around buildings controls rodent population. Reality: Cats are inefficient at rodent control especially when they are already being fed. In many situations, cats pose greater hazards than rodents.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Active ingredients in rodenticides are highly toxic to humans and precautions must be taken to prevent human exposure. • Applicators must wear proper protective equipment as required by the product label. • Rodenticides can adversely impact non-target animals through direct poisoning or secondary poisoning. • Traps, such as stick traps, may catch non-target animals such as reptiles and birds. These should only be used indoors.

COMMENTS:

1. Precautions on indoor rodent control:

    a) Most rodents are infested with ectoparasites (fleas, mites, lice) that may also infest or transmit disease to humans. Ectoparasite control should be conducted prior to eliminating (trapping or rodenticides) rodents.

    b) Rat control indoors using rodenticides should be avoided. The most commonly used rodenticide baits have a delayed toxic effect that do not kill the rodent until hours (or days for multidose) after they have consumed the bait. Rodents may die in walls and other voids where the carcass is difficult to retrieve leading to odor problems due to the decaying carcass.

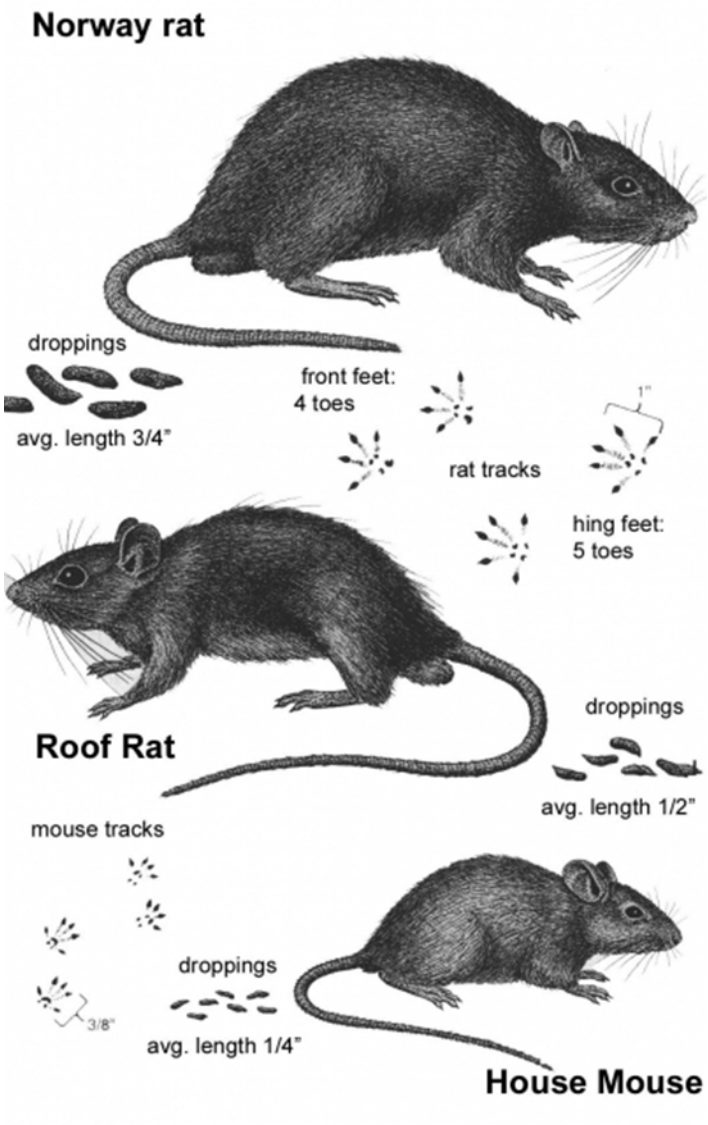
2. Disease Prevention:

    Rodents can harbor a number of human disease agents; among them are hantavirus and plague. Precautions must be taken when working in rodent infested areas. Rodent feces and dried urine may contain hantavirus that is transmitted when these waste materials are inhaled. Precautions should also be taken when handling dead rodents in traps and when found after rodenticide use. The following precautions should be taken:

    a) Avoid disturbing feces and other rodent waste when entering enclosed spaces. Use a fitted respirator with high efficiency particulate air (HEPA) filter if necessary.

    b) Soak rodent waste and dead rodents with a household disinfectant or bleach solution before removing.

c) Wear gloves when cleaning or picking up rodent carcasses. Put material in a double plastic bag and dispose of in regular trash.



VEGETATION MANAGEMENT

Invasive Weeds in Natural Areas

Terrestrial Weeds

Weeds in Right of Ways

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Invasive Weeds in Natural Areas

TARGET PEST	
TARGET PEST(S)	Non-native plants that are widespread and adversely affect the habitats they invade economically, environmentally, or ecologically.
TARGET SITES(S)	Natural areas, ranges, riparian areas, training areas, and encroachment buffers threatened by invasive weeds
PURPOSE	Control invasive weeds in natural areas since it is required by law and for the following reasons: • Impacts access to and use of training areas and ranges • Interferes with mission operations • Degrades natural habitats; impacts endangered and threatened species habitats • Preserve natural heritage • Reduce health and safety risks; may increase wildfire hazard • Reduce training costs
RESPONSIBILITY	• Pest Management Service Provider: Conduct integrated pest management to control weeds. • Pest Management Performance Assessment Representative: Ensure contractor invasive weed management provider performs work in accordance with contract specifications. The PAR may be the natural resources manager. • Grounds Maintenance Provider: Remove weeds during regular landscape maintenance to prevent establishment; maintain the health of desirable plants. • Natural Resources Manager: Oversee weed program coordinating detection and control. • Invasive Weed Management Provider: Manage weeds as required by the installation • Integrated Pest Management Coordinator: Ensure environmental compliance of the program.
SURVEILLANCE	
METHODS	Visual inspection and mapping
FREQUENCY	Yearly inspection, especially in the spring and summer when plants are easy to identify by their blooms.
ACTION THRESHOLD	Areas of installations where ordinance or other flammable/explosive materials are stored have zero tolerance for weeds due to fire hazard. Consequently, visual sighting of any weed warrants control.

STRATEGY	Develop a plan. Determine what resources need protection against invasive species and which plants pose an actual threat. For planning and measuring success, use a map to determine problem areas. Place highest priority on the most destructive weeds. Use the state's Noxious Weed List to help prioritize. The plan should include solid knowledge on the target plant, such as growing habit, how often it sets seed, months of seed production, etc. and a solid knowledge of the native species whose populations need to be maintained. Strategy options are generally to eradicate or to control and maintain invasive species at an acceptably low threshold. One strategy is to map the infestation then break the map into sections depending on the density of the invasive weed. Some areas will be dense and completely over run, while other patches are relatively free of it. Removal efforts should begin in outlier areas that are only lightly infested. Efforts should move gradually from the easiest areas to the more densely infested areas. The densest patches should be eliminated last. Refer to the Bradley Method referenced below. At each step of the way, the areas targeted for clean-up must be of a size and quality that goals are achievable within one growing season. Because of the bank of seeds stored in the soil, weeds will re-sprout for years after the plants have been removed. In the case of some weeds, the seeds can survive for decades. It is important to return and maintain cleared areas until the seed bank has been exhausted. Maps and records can assist in targeting which areas to concentrate on. After weeds have been removed it is important to recover the area in native plants to crowd out and help stop the reinvasion of invasive species.
REPORTING	• Report all pest management operations to the IPMC. • Report invasive weed control operations to the natural resources personnel in cases where weeds are being removed to protect or restore natural habitats. • Reporting of herbicide use and application monitoring to the local water regulatory agency is required when the operation is covered under a NPDES Aquatic Pesticide Permit.
ACTION THRESHOLDS	• Priority of control of weeds is based upon the Federal and State Noxious Weeds list and the impact on the mission. • Areas of installations where ordinance, or other flammable/explosive materials, is stored have zero tolerance for weeds due to the fire hazard. Consequently, visual sighting of any weed warrants control.

PREVENTION	Preventing just one new invasive weed is of greater conservation benefit in the long run and is far less costly than controlling a widespread rampant pest. Block the transport of seeds from invasive plants onto relatively clean sites or sites that are actively being cleaned. Common means of importing seeds are: • Tire tread from bicycles and vehicles • Vehicle undercarriages • Boot treads • Dung from horses or other ruminants • Top soil; seeds are often brought in with imported soils • Seed mixes; invasive species are often included in planting mixes • Potted plants; seeds are sometimes transported in the potting soil • Hay and other animal feed Check plants that are intentionally brought in to ensure none of them are invasive. Keep vehicles, tire treads, and boots clean of dirt and seeds before entering a sensitive area. If horses or other plant-eating animals are brought on the property, make sure they are moving from an infested area to an un-infested area. Import only soils from areas that do not have invasive weed problems.
GENERAL CONTROL	• Minimize soil disturbances. Soil disturbances include creating patches of bare soil or mixing and loosening soil. Many invasive plants rapidly move into disturbed areas; particularly in those areas that haven't experienced much disturbance. Choose control techniques that make the minimum amount of disturbance possible. • Anticipate unavoidable disturbances and minimize them. For example, removing a large area of plants can result in erosion issues. Landscape fabrics or mulch can reduce erosion. Some activities may disturb wildlife. Also, do not mow grasslands or remove trees during bird nesting season in sensitive habitats.
NONCHEMICAL CONTROL	
TOOLS	Hand pulling invasive weeds can be a daunting task. However, steady and persistent hand weeding over time can lead to dramatic success. There is a large variety of hand tools designed specifically for weed removal. Many of these tools can be found in online stores or ordered through the mail.
PULLING	Tools are available that help pull weeds. When pulling plants, bring as much of the root as possible out of the ground since many plants can re-sprout from even a small amount of root.
DIGGING	Digging can be used along with pulling to lift the entire plant from the soil.
CUTTING	Cutting works well with woody plants that do not re-sprout. Especially if those plants are cut as close to the ground as possible. If the plant is likely to re-sprout, chemical herbicides can be painted on top of the cut stump. For invasive trees the herbicide needs to come in contact with the cambial ring between the wood and bark of the trunk. The cambial tissues will transport the herbicide to the roots.

FLAMING	Flaming does not involve incinerating the plant, rather to heat it just long enough to produce visible wilting. Heat causes cell walls to burst, which interrupts the flow of water and nutrients. Flaming is most effective when plants are in very early stages of growth. Older plants with significant stored reserves will require repeat applications and/or concentrating enough heat on the root crown to produce mortality. Flaming is generally used as a way of coping with the huge flush of seedlings which is often triggered by the removal of parent plants. This technique is most effective and best done when the ground and vegetation are too wet to carry fire. Avoid conditions that may lead to injury or wildfire.
SOLARIZATION	Weeds and insect pests can be killed by covering the ground with layers of clear plastic allowing the sun to create enough heat to destroy all living things.
LARGE MACHINES	Large machines can remove weeds as well. Machines can clear large areas of weeds, but also tend to cause soil disturbances which encourage the invasion of weeds and sometimes pathogens.
PRESCRIBED FIRE	Prescribed fire can be effective in removing fire-sensitive invasive species from communities that evolved with fire. Blowtorches and flamethrowers can also be used to burn individual plants or small areas.
COMPETITION AND RESTORATION	Use native plants to outcompete invasive weeds. To do so, natives must be planted and cared for until they are well established. When choosing seed mixes choose seeds that are from adjacent sites and well adapted to the climate. Choosing plants from far away sources is a common cause of failure. Be careful of seed mixes that include other invasive plants.
GRAZING	Grazing animals can selectively control or suppress weeds. Cattle, sheep, goats, geese, and chickens have been used to graze undesirable species. Grazing must be continued until the weed's seed bank is exhausted. It is important never to move the animals from an infested to an un-infested site since seeds can be spread in the animals' droppings.
BIOLOGICAL CONTROL	Beneficial organisms can reduce a few certain plants. For example, two species of leaf beetle have been very effective in wiping out populations of purple loosestrife. To be effective, the insect or pathogen must be host-specific and not pose a threat to other plants.
PLANT DISPOSAL	• Avoid leaving plant remains onsite. Many plants can re-root themselves if left in piles and grow anew. • If the invasive plants have seed heads, remove them from the site in sealed bags to ensure that the seeds aren't spread to new areas on the way out.
CLEANING OF VEHICLES AND EQUIPMENT	• In order to prevent the introduction and spread of invasive weeds, all vehicles and equipment used on a base (especially those used for weed control) must be cleaned of dirt, mud, and visible plant material prior to being brought on base (if coming from off-base) or prior to coming on site (if coming from another location on base). • Vehicles and equipment must also be cleaned after construction, prior to being used elsewhere on base. • When moving vehicles/equipment from site to site when doing weed control, they should also be inspected and cleaned in order to prevent further spread. • Equipment may include things like weed whackers, shoes, shovels, etc. • Before leaving a site, workers should brush off shoes in order to prevent tracking seeds on the way to other sites.

CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Glyphosate, triclopyr, 2, 4D, imazapyr, and others
METHOD OF DISPERSAL	• Selective Broadcast Herbicides. These herbicides usually selectively kill one class of plants and are safe on other classes of plants. The herbicide is applied evenly over a large area of land usually through a boom sprayer. Boom sprayers can be mounted on a tractor, ATV, truck, airplane, or helicopter. Relatively small areas can be treated with a backpack sprayer or hand-compressed sprayer. • Non-selective Spot Treatment Herbicides. This method directly targets individual plants. Non-selective herbicides are used and are applied directly to the target and are less likely to affect nontarget plants. Care must be taken to reduce drift that could harm non-target plants. Direct application is sometimes used in conjunction with nonchemical treatments especially when removing invasive trees and shrubs which require root kill to prevent re-sprouting. • Foliar Spray • Cut Stump Treatment Note: Correct timing of the herbicide application is often essential for effective weed control. Timing will depend on the species of weed, the mode of action, and persistence of the herbicide; nonchemical practices in use; soil conditions; and climate.
RESTRICTIONS/ REGULATIONS/ PERMITS	• When applying herbicide to riparian areas or other sites near water, use only formulations labeled for aquatic sites. • Herbicide applications to, over, or near waters of the United States may require coverage under a NPDES Aquatic Pesticide Permit.
CONSIDERATIONS	
SENSITIVE AREAS	• Areas frequented by children—use mechanical controls instead of chemical controls whenever possible around playgrounds and childcare centers. • Sensitive habitats—Use non-chemical methods in natural areas containing endangered or threatened plant or animal species or use herbicides with care. • Use drift-reduction methods to prevent damage to non-target plants and organisms and sensitive sites. • Prevent pesticide drift into sensitive areas.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Applicators must use personal protective equipment as required by the product label. • Since this operation is conducted in natural areas, care must be taken to prevent adverse impacts to the environment through control measures, vehicles, and workers.
SPECIAL APPLICATOR QUALIFICATIONS	• Contractors and personnel conducting invasive weed control must be knowledgeable about identifying and controlling the target plants. They must also be knowledgeable about preventing the spread of invasive plants. • They should also be able to produce maps (preferably using GPS and GIS) and write detailed reports. • All personnel applying herbicides must be licensed/certified pesticide applicators.

ADDITIONAL INFORMATION:

Management of invasive species
http://www.cal-ipc.org/ip/management/ipcw/mois.php

The Bradley Method for Control of Invasive Plants
http://courses.washington.edu/ehuf462/462_mats/bradley_method.pdf

Federal and State Noxious Weed Lists
http://plants.usda.gov/java/noxiousDriver

Database of herbicide labels
http://www.greenbook.net/

Center for Invasive Plant Management
http://www.weedcenter.org/

DOD Strategic Management of Invasive Species in the Southwestern United States
http://www.weedcenter.org/dodworkshop/2009/index.html

Terrestrial Weeds

TARGET PEST	
TARGET PEST(S)	Grass-like, broadleaf, and woody weeds growing on land
TARGET SITES(S)	• Landscaped areas • Natural areas threatened by invasive weeds
PURPOSE	• Reduce fire hazards • Remove vegetation coverage for rodents and other pests • Control the spread of invasive species
RESPONSIBILITY	• Pest Management Service Provider (PMSP): Conduct integrated pest management to control weeds. • Pest Management Performance Assessment Representative (PMPAR): Ensure contractor pest management service provider performs work in accordance with contract specifications. • Grounds Maintenance Provider (GMP): Remove weeds during regular landscape maintenance to prevent establishment; maintain the health of desirable plants.
SURVEILLANCE	
METHODS	Visual sighting
FREQUENCY	• Daily inspection of areas with extreme fire hazard • Weekly inspection of landscaped areas. Can be done in conjunction with regular landscape maintenance. • Yearly inspection of natural habitats targeted for ongoing weed-abatement programs
ACTION THRESHOLD	Areas of installations where ordinance or other flammable/explosive materials are stored have zero tolerance for weeds due to fire hazard. Consequently, visual sighting of any weed warrants control.

NONCHEMICAL CONTROL	
MECHANICAL REMOVAL	• Pulling or hoeing: pulling can be done either by hand or with tools such as the weed wench which works well on large plants. Try to pull up as much root as possible as roots can sprout new shoots. Digging or hoeing is sometimes used in conjunction with pulling to remove the entire root. Follow up work will be necessary until desired plants become well established. • Mulching: mulch shades the soil surface and kills sprouting weeds. Mulching also keeps lawn mowers away from ornamentals. • Mowing: Mow unwanted plants before they have a chance to set seeds. • Chaining: chains are dragged across the top of target weeds, destroying the canopy and reducing weed density. • Root plowing: horizontal blades beneath the surface of the ground sever the root system of target weeds
STEAM	Steam applied to foliage will often kill plants. This technique is unlikely to be cost effective for most weed-control situations
IMPROVE PLANT VIGOR	• Landscaping plants that are healthy will be better able to compete with weeds, thereby slowing the rate of weed invasion. • Maintain proper watering, fertilizing, and pruning schedules for desirable landscaping plants. This is particularly important for managing crabgrass in turf.
MULCH	• Organic mulches include wood chips, sawdust, yard waste, and bark chips. Course textured mulches should be applied up to 4 inches deep. Fine textured mulches should be applied to a depth of about 2 inches. • Inorganic mulches include sand, gravel, and pebbles. Use a porous landscape fabric underneath to prevent mulch from sinking into soil. • Synthetic mulches include geotextiles and landscape fabric. Synthetic mulches can be used in conjunction with organic and inorganic mulches.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Glyphosate, 2,4-D, diuron, dicamba, sethoxydim, bromacil, diquat, surflan, and others
METHOD OF DISPERSAL	• Pre-emergent: herbicide is applied to the soil before the weed emerges, preventing the weed from developing. The chemical should be applied to the soil just before seed germination. Selective pre-emergents must be used so that desirable landscape plants are not harmed. • Foliar-sprayed Post-emergent: herbicide is sprayed directly onto the foliage of the weed. Post-emergents should be applied after the weed emerges, but before seed set. Foliar application is most effective when weeds are young. • Soil-applied Post-emergent: herbicide is applied to the soil around the weed. The herbicide is absorbed by the plant through its root system. • Stump Treatment: herbicide is applied to stumps immediately following cutting. For trees, the herbicide needs to cover the cambium which is located between the bark and wood. The herbicide prevents the tree or weed from growing stump-sprouts in the next growing season. • Weed and Feed Products: Some fertilizers are formulated with herbicides to prevent the growth of weeds. Note: Correct timing of the herbicide application is often essential for effective weed control. Timing will depend on the species of weed, the mode of action and persistence of the herbicide, nonchemical practices in use, soil conditions, and climate.

CONSIDERATIONS	
SENSITIVE AREAS	• Use mechanical controls instead of chemical controls whenever possible around playgrounds and childcare centers. • Avoid exposing natural areas containing endangered or threatened plant or animal species. • Prevent pesticide drift into sensitive areas and onto desirable landscape plants.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Applicators use personal protective equipment required by the product label. • Prevent drift of herbicides to non-target areas and prevent contact with desirable plants. Avoid contaminating water.

ADDITIONAL INFORMATION:

Non-chemical methods are preferred.

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Weeds in Right-of-Ways

TARGET PEST	
TARGET PESTS	Grasses and broadleaf and woody weeds
TARGET SITES(S)	Fence lines, road shoulders, parking lots, around fuel storage tanks, and sidewalks.
PURPOSE	• Decrease fire hazard • Prevent damage to paved surfaces • Decrease rodent and other pest infestations in dense weeds • Decrease the risk for vehicle and animal collisions due to weeds along roadways hiding wildlife • Increase sight lines along security fences • Improve aesthetics.
RESPONSIBLE PARTY	• Pest Management Service Provider: Conduct integrated pest management to control weeds • Pest Management Performance Assessment Representative: Ensure contractor pest management service provider performs work in accordance with contract specifications. • Grounds Maintenance Provider: Mowing to reduce height of weeds. May be the PMSP.
SURVEILLANCE	
METHODS	• Visual observation and identification during routine inspections. Annual surveys of roadways and fence lines.
FREQUENCY	• Daily inspection of area with extreme fire hazard. • Weekly inspection of landscaped areas. Can be done in conjunction with regular landscape maintenance.
ACTION THRESHOLD	• Areas of installations where ordnance or other flammable/explosive materials are stored have zero tolerance for weeds due to fire hazard. Consequently, visual sighting of any weed warrants control.

NONCHEMICAL CONTROL	
MECHANICAL REMOVAL	• Pulling or hoeing: pulling can be done either by hand or with tools such as the weed wench which works well on large plants. Try to pull up as much root as possible as roots can sprout new shoots. Digging or hoeing is sometimes used in conjunction with pulling to remove the entire root. Follow up work will be necessary until desired plants become well established. • Mowing: Mow unwanted plants before they have a chance to set seeds. • Chaining: Chains are dragged across the top of target weeds, destroying the canopy and reducing weed density. • Root plowing: Horizontal blades beneath the surface of the ground sever the root system of target weeds.
STEAM	Steam applied to foliage will often kill plants. This technique is unlikely to be cost effective for most weed-control situations
PLANT COMPETITION	Plant areas with desirable, low-height plants to outcompete weeds such as invasive grasses.
WEED CONTROL MAT	Comes in roll form and is composed of synthetic polyester fibers spun tightly together to prevent weed growth by blocking sunlight, yet still allowing water percolation for drainage, http://www.dot.ca.gov/hq/LandArch/roadside/detail-fwc.htm
MULCH	• Organic mulches include wood chips, sawdust, yard waste, and bark chips. Course textured mulches should be applied up to 4 inches deep. Fine textured mulches should be applied to a depth of about 2 inches. • Inorganic mulches include sand, gravel, and pebbles. Use a porous landscape fabric underneath to prevent mulch from sinking into soil. • Synthetic mulches include geotextiles and landscape fabric. Can be used in conjunction with organic and inorganic mulches.
CHEMICAL CONTROL	
COMMON ACTIVE INGREDIENTS	Imazapyr, dichlobenil, bromacil, diuron, pendimethalin, prometon, tebuthiuron, hexazinone, dicamba, 2,4-D, diflufenzopyr, glyphosate, triclopyr, metsulfuron methyl, paraquat, sulfometuron, and others.
METHOD OF DISPERSAL	• Pre-emergent: Herbicide is applied to the soil before the weed emerges, preventing the weed from developing. The chemical should be applied to the soil just before seed germination. Selective pre-emergents must be used so that desirable landscape plants are not harmed. • Foliar-sprayed post-emergent: Herbicide is sprayed directly onto the foliage of the weed. Post-emergents should be applied after the weed emerges, but before seed set. Foliar application is most effective when weeds are young. Use spot treatment of weeds on paved areas. • Soil-applied post-emergent: Herbicide is applied to the soil around the weed. The herbicide is absorbed by the plant through its root system. Applications can be made to soil or paved surfaces. Herbicide treatments can also be made to graded surfaces prior to pouring asphalt or concrete during road or walkway construction. Note: Correct timing of the herbicide application is often essential for effective weed control. Timing will depend on the species of weed, the mode of action and persistence of the herbicide, non-chemical practices in use, soil conditions, and climate.

CONSIDERATIONS	
SENSITIVE AREAS	• Use mechanical controls instead of chemical controls whenever possible around playgrounds and childcare centers. • Avoid exposing natural areas containing endangered or threatened plant or animal species. • Prevent herbicide drift onto desirable landscape plants.
SAFETY AND ENVIRONMENTAL PRECAUTIONS	• Applicators use personal protective equipment required by product label. • Prevent drift of herbicides to non-target area and prevent contact with desirable plants. Avoid contaminating water.

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APPENDIX A

Points of Contact

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A.1 INSTALLATION PEST MANAGEMENT POINTS OF CONTACT

This list provides the contact information for pesticide compliance and pest management. This page should be kept up to date to ensure the appropriate personnel may be contacted as necessary.

Name	Title	Phone Number (Area Code 228)	E-mail
Nichols, Danny	IPMC	822-5938	danny.nichols@navy.mil
Brooks, Cynthia	GMPAR	871-2943	cynthia.brooks@navy.mil
CDR Nottingham, Brian	Public Works Officer	871-2200	brian.nottingham@navy.mil
Shiyou, Robert	DPWO	871-2020	robert.shiyou@navy.mil
Noble, Lisa	Environmental Director	871-2026	lisa.noble@navy.mil
Fannaly, Marion	Natural Resources Manager	688-5523	marion.fannaly@navy.mil
HMC Guimary, Raquel	PREVMED	822-5488	raquel.guimary@med.navy.mil
SGT Mitchell, Vanessa	Veterinary Services, Keesler AFB	376-7498	
Brockway, Deborah	MWR Director	871-2116	deborah.brockway@navy.mil
Riley, Dewayne	MWR Maintenance	871-4042	dewayne.riley@navy.mil
Tice, Patricia	Commissary Manager		
Harvey, Dodey	NEX Services Manager		
Carlisle, Pamela	Child Development Center Director		pamela.carlisle@navy.mil
Cornell, Scott	Pest Controller		scott.cornell@navy.mil
Neely, Tommy	Shop Foreman	871-2171	tommy.neely@navy.mil
Schultz, Matt	Production Division Director	871-2045	matt.schultz@navy.mil
Halcin, Tony	Facility Commodity Manager	871-2197	tony.halcin@navy.mil
Money, Tim	Forester	(904) 542-6873	timothy.money@navy.mil
Public Works Trouble Desk: 1-855-462-8322			

A.2 NAVAL FACILITIES ENGINEERING COMMAND, ATLANTIC APPLIED BIOLOGY SECTION POINTS OF CONTACT

NAVFAC Atlantic Applied Biology Section		
Code EV51	6506 Hampton Blvd	Norfolk, VA 23508-1278

COMMERCIAL	DSN
Commercial: (757) 322-XXXX	DSN: 262-XXXX

NAME	TITLE	EXT	EMAIL
Sabra Scheffel	Applied Biology Dept Head	4320	sabra.scheffel@navy.mil
Steven Holmes	Pest Management Consultant	8295	steven.p.holmes@navy.mil
Chris Martin	Pest Management Consultant	4611	chris.d.martin@navy.mil
Steve Robertson	Pest Management Consultant	4796	steve.b.robertson1@navy.mil
Kirk Williams	Pest Management Consultant	4254	kirk.williams@navy.mil

A.3 NAVY ENTOMOLOGY CENTER OF EXCELLENCE POINTS OF CONTACT

Navy Entomology Center of Excellence (NECE)		
Naval Air Station	P.O. Box 43 Bldg 937	Jacksonville, FL 32212-0043

COMMERCIAL	DSN
(904) 542-2424	942-2424

A.4 NAVY ENVIRONMENTAL PREVENTIVE MEDICINE UNIT TWO POINTS OF CONTACT

Navy Environmental Preventive Medicine Unit TWO (NEPMU-2)		
NEPMU-2	128 West D Street, Bldg U238	Norfolk, VA 23511-3394

COMMERCIAL	DSN	FAX
757-953-6600	377-6600	151-953-7212

E-MAIL	WEBSITE
nepmu2@med.navy.mil	http://www.med.navy.mil/sites/nepmu2/Pages/default.aspx

APPENDIX B

Program Review

B.1 PEST MANAGEMENT PROGRAM SELF-ASSESSMENT CHECKLIST

B.2 INTEGRATED PEST MANAGEMENT PLAN ANNUAL UPDATE FORM

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B.1 PEST MANAGEMENT PROGRAM SELF-ASSESSMENT CHECKLIST

Installation Name:_____**Date:**_____

Name of Person Completing Checklist:_____

Review Item	Reference	Verification and Documentation	Y	N	N/A
Pest Management Coordinator					
Is IPMC designated and appointed by CO/CG by letter?	6250.4C: Encl. (1), Para.4.h.(6) 5090.1: 24-5.3	Copy of appointment letter.			
Is IPMC properly qualified and trained? If an IPMC selects or applies pesticides, he or she must be certified as a DOD pesticide applicator.	6250.4C: Encl. (1), Para.6.	Copy of course completion certificate or DOD pesticide applicator certificate.			
Does the IPMC oversee the installation pest management program and pest management plan and remain aware of and familiar with all pest management operations on the installation?	4150.07: E2.11	Operations documented in the installation integrated pest management plan; IPMC has copies of pesticide approvals and pest management reports; IPMC is actively involved in pest management decision making.			
Pest Management Plan					
Does installation have a current comprehensive IPMP? IPMPs remain current for 5 years.	4150.07: E4.2. 6250.4C: Encl. (1), Para.9.a. 5090.1: 24-3.9. 5090.2A: 14203	Copy of IPMP.			
If installation does not have an IPMP, has command planned and budgeted for development and maintenance of an IPMP?	4150.07: E4.2.1.1.	Environmental division should have IPMP listed as a deficiency and submit an EPR.			
Is IPMP signed by CO/CG?	6250.4C: Encl. (1), Para.9.a.	IPMP signature page.			
Is IPMP reviewed and signed by IPMC, medical department, and BUMED and NAVFAC pest management consultants?	4150.07: E4.2.1.7 6250.4C: Encl. (1), Para.6.a.	IPMP signature page.			
Is IPMP updated annually by qualified personnel (trained or certified IPMC or PMPAR) and current (contains current POCs, contracts, applicator licenses, list of approved pesticides, etc.)?	4150.07: E4.2.1.2.	View applicator licenses, dates of pesticide approvals, and other items that indicate the information is not outdated.			
IPMP includes the following sections: • List of program objectives • Description of all pest management requirements and programs and staffing requirements (including in-house, contract, agricultural outlease, golf course, NAFI, GOCO, experimental, and natural resources) • Description of IPM procedures for all pest and disease vectors • Identification of program resources (facilities, equipment, etc.) to support program • List of pesticides approved by NAVFAC pest management	4150.07: E4.2.	IPMP contains information and sections as outlined in 4150.07, Encl.4.			

consultant • Procedures for managing spills • Identification of planned measures to comply with DOD MOA and with state pesticide regulatory office regarding use or application of pesticides • Description of contracted pest management operations • Description of operations with special environmental considerations • Identification of animal control efforts • Identification of potential vector-borne diseases and collaboration with local health agencies • Applicable laws and regulations • Agricultural outlease operations					
Section of IPMP pertinent to pest management in habitat(s) of endangered/threatened species is reviewed and comment provided by U.S. Fish and Wildlife Service.	4150.07: E4.8.1.	Correspondence from USFWS that they have reviewed the IPMP is on file.			
All stakeholders (including IPMC, PMPARs, environmental division, medical department, pest control shops, NAFIs, agricultural outlease program manager, and golf course superintendent) have copy of or ready access to current IPMP.	BMP	IPMP readily available to stakeholders as hard or electronic copy.			
Program Maintenance					
Have BUMED and/or NAVFAC conducted program reviews in order for the installation to maintain program and IPMP?	6250.4C: Encl. (1), Para.10.a. 5090.1: 24-3.10. 5090.2A: 14204,1.c.	Program reviews on file.			
Have deficiencies and recommendations from past reviews been resolved or addressed in order to maintain and improve program?	6250.4C: Encl. (1), Para.10.a. 5090.1: 24-4.4 5090.2A: 14204,1.c.	Documentation of corrections on file and/or corrections made were noted in follow-up inspection or review.			
Do DOD pest management personnel remain current in IPM technologies?	BMP	Personnel attend training workshops, are provided in-service training and/or have access to pest control trade journals.			
Training and Certification					
Do all installation pest management personnel who apply or supervise the application of pesticides have current DOD certification or EPA-approved certification or license?	4150.07: E4.4.2. 5090.1: 24-3.19.	Copies of all licenses and certificates on file, preferably in IPMP, and applicators have cards while applying.			
If DOD applicator certification expired, has applicator received a six-month extension from a NAVFAC pest management consultant?	4150.07: E4.4.2.1.	Correspondence from NAVFAC approving extension.			
If DOD applicators are not certified (i.e., apprentices), are they under the direct supervision of a certified applicator while performing pesticide applications?	4150.07: E4.4.2.	Observe operations to ensure proper supervision, if necessary.			

Was evidence of contractor pesticide applicator licensing or certification provided to contracting officer prior to award?	4150.07: E4.4.2.2 6250.4C: Encl. (1), Para. 15.b.	Copies of all licenses and certificates on file, preferably in IPMP, and applicators have cards while applying.			
Are PMPARs trained in performance assessment evaluation and pest management technology?	6250.4C: Encl. (1), Para. 15.c.	Copies of training course certificates on file, preferably in IPMP.			
Do pest management personnel seek and attend continuing education courses?	BMP	Copies of course completion certificates on file.			
Staffing					
Is staffing sufficient to effectively control pests and manage program?	BMP	Interview applicators, supervisors, and managers.			
If personnel indicate that staffing is insufficient, then what indicators or data are being collected to show that staffing levels are insufficient?	BMP	View indicators or data.			
Pesticide Procurement					
Does installation use only pesticides approved by NAVFAC pest management consultant?	4150.07: E4.2.2.1. 5090.1: 24-3.16. 5090.2A: 14206.1.b.	IPMC maintains approved pesticide list. Inspect pesticides in pest control storage and on vehicles to ensure they are listed on the current pesticide approval list.			
Pest Management Records and Reporting					
Are records kept for all pest management operations conducted on the installation, including those by NAFIs and for agricultural operations and environmental protection?	7 U.S.C. § 136i-1(a)(1) 6250.4C: Encl. (1), Para. 23. 5090.1: 24-3.16. 5090.2A: 14210 4150.07: E4.11.1				
Are records retained indefinitely?	6250.4C: Encl. (1), Para.23.a. 5090.1: 24-3.4.				
Do personnel and regulatory agencies have ready access to records? (e.g., able to access records by location, pesticide, applicator, etc.)	7 U.S.C. § 136i-1(b)				
Is the installation using the NAVFAC Online Pesticide Reporting System?	BMP				
Are reports of pest management operations being sent to NAVFAC?	6250.4C: Encl. (1), Para. 23.b.				
Contracting					
Do properly trained PMPARs inspect the performance of contractors?	4150.07: E4. 6.4.(1)	Training certificates and contract monitoring documents are on file.			
Are all pest management contracts on the installation monitored by PMPARs?	4150.07: E4. 6.2.	Check also MCCS, MCX, NEX, and MWR contracted services.			
Do PMPARs measure efficacy and ensure safety and environmental compliance of contract pest control?	6250.4C: Encl. (1), Para.15.c.	Interview PMPARs to identify method and frequency of inspections. List methods of measurement.			
Are pest management contracts sent to NAVFAC for review?	5090.1: 24-3.16	Correspondence with NAVFAC.			
Are all contract pesticide applicators currently licensed in the state in which they operate?	4150.07: E4.4.2.2. 4150.07: E4.6.1.	Copies of current certificates or licenses are on file, preferably in IPMP.			
Is the pest control contractor currently registered with the Structural Pest	4150.07: E4.6.1.	Copy of current registration certificate on file, preferably in IPMP.			

Control Board or the equivalent state pest control business registration agency?					
Pest Control Shop					
Does pesticide storage area pose a hazard to personnel in adjacent areas or buildings?	4150.07: E4.5.1. 1028/8A: Para.2.4	Inspect building to see that exhaust vapors will not move into adjacent occupied areas.			
Does storage area have sufficient security to prevent unauthorized entry?	4150.07: E4.5.1. 1028/8A: Para.2.8	Conduct inspection to ensure doors can be locked, equipment storage areas can be secured, and that applicators lock doors when leaving premises.			
Does building have clean area for office?	4150.07: E4.5.1. 1028/8A: Para.3.1.3.1				
Are separate laundry facilities (designated only for cleaning of clothing potentially contaminated with pesticide) available for work clothing?	BMP				
Are shower facilities available for employees?	BMP				
Is separate space or cabinets provided for storage of PPE?	4150.07: E4.5.1. 1028/8A: Para.3.1.3.1.3				
Are pesticides stored off the floor and with sufficient access so that all labels are visible?	4150.07: E4.5.1. 1028/8A: Para.3.1.4.1.2				
In areas where pesticide concentrates are stored or mixed, are floor drains sealed or not present and is containment provided (bermed or sloped floors)?	4150.07: E4.5.11028/8A: Para.3.1.4.1.2 5090.1: Para.24-3.11				
Are all surfaces on which pesticides are stored and mixed and on which pesticide application equipment is serviced made of non-absorbent materials?	4150.07: E4.5.1. 1028/8A: Para.3.1.4.1.2				
Are pesticides stored in a dry room or building with a temperature between 50 °F and 100 °F?	4150.07: E4.5.1. 1028/8A: Para.3.1.4.1.2				
Are fire extinguishers provided and easily accessible to occupants?	4150.07: E4.5.1. 1028/8A: Para.3.1.4.1.2	Inspect inspection record and see that fire extinguishers are fully charged.			
For large pesticide containers with spigots, is a drip pan containing absorbent material placed below spigot?	4150.07: E4.5.1. 1028/8A: Para.3.1.4.1.2				
Are backflow prevention devices installed on faucets used to fill pesticide tanks?	4150.07: E4.5.1. 1028/8A: Para.3.5.2.10				
Are emergency decontamination facilities (i.e., eye wash, deluge shower) provided onsite and readily accessible?	4150.07: E4.5.1. 1028/8A: Para.3.5.2.12	Check to see that it is functional and that inspection records are up-to-date. Ensure that, in an emergency, personnel can easily access and operate the devices.			
Are ventilation fans available in storage and mixing areas and do they function and provide adequate ventilation (six changes of air per hour)?	4150.07: E4.5.1. 1028/8A: Para.3.5.4.2 5090.1: 24-3.11.	Operate fans. Check IH survey ventilation results (Copy may be available in shop or contact installation IH).			
Are identification signs clearly visible on building and fences to advise	4150.07: E4.5.1. 1028/8A: Para.3.8				

personnel of the contents and warn of their hazardous nature?					
Are only pesticides listed on approved pesticide list stored?	4150.07: E4.5.1. 5090.1: 24-3.16. 5090.2A: 14206.1.b.	Compare approved pesticides list with items stored on shelves.			
Do all pesticide containers have EPA-approved labels attached?	5090.1: 24-3.5.				
Are spill kits provided and readily accessible?	6250.4C: Encl. (1), Para. 13.d. 5090.1: 24-3.12(b)	Inspect to ensure contents are suitable for pesticide spills.			
Are MSDSs and labels for each pesticide stored and used maintained and readily accessible in the pest control shop?	5090.1: 24-3.5	Review MSDS/label book and compare with pesticides stored in shop and on vehicles.			
Pest control equipment					
Is equipment properly maintained and clean (no evidence of leakage and spillage)?	BMP				
Are different sprayers used for herbicides and insecticides?	BMP	Sprayers are properly marked.			
Is equipment routinely calibrated to ensure proper delivery of pesticide?	BMP	Calibrations, if needed, are recorded in a logbook or other recordkeeping system.			
Is application equipment stored in a secure area?	4150.07: E4.5.1. 1028/8A: Para. 3.4.6.				
Pest Control Vehicles (DOD and Contract)					
Are pesticides stored in a lockable compartment on the vehicle?	BMP				
Does applicator ensure that pesticides are not stored in passenger compartment of vehicle?	BMP				
Is the vehicle clean and maintained (no evidence of leakage and spillage)?	BMP				
Does the vehicle have a properly stocked spill kit?	6250.4C: Encl. (1), Para. 13.d.				
Is the vehicle properly identified to warn of pesticides on vehicle?	BMP				
Are all containers on vehicle, including service containers, properly labeled?	5090.1: 24-3.5.				
Is PPE properly stored on vehicle?	BMP				
Are SDSs (formally MSDSs) for pesticides carried on vehicle?	BMP				
Are appropriate wash racks provided for cleaning vehicles (i.e., does not drain into stormwater system)?	BMP				
Integrated Pest Management					

Is integrated pest management practiced in order to minimize pesticide use when non-chemical alternatives are available and cost effective?	7 U.S.C. § 136r-1 6250.4C: Encl. (1), Para. 3.c. (5) 5090.1: 24-3.8 5090.2A: 14202/14301.8. 4150.07: E4.2.	Pest management service providers have survey devices (i.e., sticky traps) and less toxic and sustainable pesticides (i.e., baits) in their inventory. Records include surveys and the application of less toxic pesticides and use of non-chemical methods.			
Does the installation pest management plan emphasize and describe the use of IPM to provide sustainable pest management?	7 U.S.C. § 136r-1 6250.4C: Encl. (1), Para. 3.c.(5). 4150.07: 4.2 5090.2A: 14202	Review IPMP sections that list pest control methods. Review installation instructions, orders, or policies, especially for housing, that encourage IPM practices.			
Does the installation use practices that demonstrate IPM?	7 U.S.C. § 136r-1 6250.4C: Encl. (1), Para. 3.c. (5) 4150.07: 4.4 5090.2A: 14202	Identify and list practices.			
Does the installation promote IPM?	7 U.S.C. § 136r-1 6250.4C: Encl. (1), Para. 3.c. (5) 4150.07: 4.1 5090.2A: 14202	Identify and list promotion practices.			
Pesticide Application					
Are pesticides applied in accordance with the label directions?	7 U.S.C. § 136(j) 4150.07: E4.5.3.	Interview applicators. Observe application if possible. Wear appropriate PPE.			
Are special precautions taken for operations at child development centers, housing, medical treatment facilities, and food preparation areas?	4150.07: E4.8.1, E4.8.2, and E.4.8.3.	Interview applicators and review records to see if steps are taken to minimize pesticide use or use less toxic pesticides in these areas.			
Are liquid and dust formulations of pesticides applied only when unprotected personnel are not occupying the work space to be treated?	5090.1: 24-3.2.	Interview applicators. Observe application if possible. Wear appropriate PPE.			
Are preventive pesticide treatments prohibited unless approved by a pest management consultant?	4150.07: 4.10.3.	Interview applicators regarding practices. Review pest management records to see if there is any indication of routine pesticide applications.			
Are all applicators familiar with the installation's spill response procedures?	6250.4C: Encl. (1), Para. 13.d.	Get copy of installation instruction on spill response procedures. Interview applicators.			
Are all feasible efforts and management controls used to avoid production of hazardous wastes and to ensure use of pesticides before shelf-life expiration?	6250.4C: Encl. (1), Para. 13.f.	Ask applicators how they clean equipment and dispose of rinsate. Interview shop supervisor to determine container disposal methods.			
Is the installation aware of and do they enforce pesticide "stop sale, use, or removal" orders issued by the EPA?	FIFRA	Check EPA Web site regarding the provisions of pesticide orders. Check records to see if pesticides that have a "stop sale, use, or removal" order are being used contrary to the provisions of the order.			
Aerial Pesticide Applications					
If conducted or proposed, has a plan for the aerial application of pesticides been reviewed and approved by a BUMED (medically-important pests) or	6250.4C: Encl. (1), Para. 13.e.	Ask for and review signed validation statement.			

NAVFAC (economic pests) aerial spray-certified pest management consultant?					
Safety					
Are applicators provided with the appropriate PPE?	5090.1: 24-3.7.	Ask applicators to show you PPE in shop and on vehicles.			
Do applicators maintain and wear appropriate PPE when applying pesticides?	6250.4C: Encl. (1), Para. 12.b.	Ask applicators to show you PPE in shop and on vehicles. Observe application, if possible.			
Do all applicators receive training on use of PPE? Are applicators physically qualified to wear respirators?	4150.07: 5.4.17.	Review training record or rosters. Ask to see respirator fit test cards.			
NAFI Operations (NEX/MCX/MCCS/MWR)					
Are all NAFI pest management operations described in the IPMP? This includes operations conducted at: • NEX/MCX retail stores • NEX/MCX and MWR/MCCS food service facilities • MWR/MCCS athletic fields and golf courses	4150.07: 4.2.	Review IPMP.			
Are pesticides used by NAFI pest control providers included on the installation approved pesticide list?	4150.07: E4.2.2.1. 5090.2A: 14206.1.b.	Pesticides used by NAFIs are included on pesticide approval list.			
Are pesticide use records maintained at each facility?	7 U.S.C. § 136i-1(a)(1) 6250.4C: Encl. (1), Para. 23.a. 5090.2A: 14210	NAFI maintains records.			
Are all pest management operations reported to the installation IPMC so that it can be reported to NAVFAC?	6250.4C: Encl. (1), Para. 23.b.	Records and reports contain operations conducted by NAFIs			
If NAFIs purchase pest control services with the DON purchase card, are the services in compliance with DOD and DON pest management requirements?	4200.1: Para.7.				
Pesticide Retail Sales in the Navy Exchange, Commissary, and Veterinary Clinics					
Are only pesticides that are not Category I pesticides labeled "Danger, Poison" displayed for retail sale?	6250.4C: Encl. (1), Para. 13.c.	Inspect pesticide display.			
Are pesticides properly displayed to prevent contamination of food, equipment, utensils, linens, and single-service and single-use articles? (i.e., separated by partition or located in an area not above items)	FOOD: 7-301.11	Inspect pesticide display.			
Are spill containment items available?	6250.4C: Encl. (1), Para. 13.d.	Inspect spill containment kits.			
Are employees familiar with spill procedures?	6250.4C: Encl. (1), Para. 13.d.	Ask employees to describe procedures.			
Is the retail store aware of and do they enforce pesticide "stop sale, use, or removal" orders issued by the EPA?	FIFRA	Check EPA Web site regarding the provisions of pesticide orders. Check retail shelves to see if pesticides that have a "stop sale, use, or removal" order are being displayed for sale contrary to the provisions of the order.			

Environmental Programs					
Does the installation have a program to comply with the Federal Noxious Weed Act that is also being implemented on state or private lands in the vicinity of the installation?	5090.2A: 14208.14.	Review any plans (INRMP) or contracts for noxious weed control. Identify and list specific control/prevention measures.			
If the installation has an active airfield, does the IPMP reference the BASH plan?		Review any plans, directives, or contracts for BASH. Identify and list specific control/prevention measures.			
Does the IPMP reference the INRMP? Are appropriate portions of the IPMP implemented in accordance with the INRMP?	5090.1: 24-3.9. 4150.07: 5.4.20.12	Review IPMP.			
Are pesticides used in invasive weed control, BASH, depredation and other environmental programs included in the installation approved pesticide list?	5090.1: 24-3.16. 5090.2A: 14206.1.b.	Review records or plans.			
Are pesticides used in these operations recorded and reported to the IPMC so that they can be reported to NAVFAC?	7 U.S.C. § 136i-1(a)(1) 6250.4C: Encl. (1), Para. 23.b. 5090.2A: 14210	Review records. Check to see that IPMC has records.			
Have pest management operations that may have an impact on natural resources been coordinated with and reviewed by the natural resources program manager?	6250.4C: Encl. (1), Paragraphs 20, 21, and 22. 5090.2A: 14301.18.h.	Review IPMP for environmental impacts of pest management operations and for environmental manager signature. Interview natural resources manager to ensure if he/she is aware of pest management impacts on natural resources.			
If feral cats and dogs are present or potentially present, does the installation have a program to capture and remove them from the installation?	6401.1A: Para.4-2c(4) CNO policy letter 5090 N456M/ 1U595820 of 10 Jan 2002	Visual observations. Review installation policies or directives. Identify and review procedures.			
Are installation pest management and environmental personnel and the installation commander aware of the CNO policy on feral animals?	CNO policy letter 5090 N456M/ 1U595820 of 10 Jan 2002	Does the installation have an instruction, order, or policy to prevent feral animals?			
Is the CNO feral animal policy communicated to installation personnel and enforced?	CNO policy letter 5090 N456M/ 1U595820 of 10 Jan 2002	Identify practices that support the presence of feral animals.			
Agricultural Outlease Program					
Does the IPMP describe the agricultural outlease pest management program?	4150.07: E4.2.	Review IPMP.			
Are agricultural pesticides included on the installation list of approved pesticides?	4150.7: E4.6.a.(2) 5090.1, 24-3.16 5090.2A: 14206.1.b.	Review records or plans.			
Are the pest management operations reported to the installation IPMC reported to the NAVFAC PPMC?	7 U.S.C. § 136i-1(a)(1) 6250.4C: Encl. (1), Para. 23.b. 5090.1, 17-4.2 5090.2A: 14210	Review records. Ensure IPMC has records.			
Is on-base agricultural pesticide storage in compliance with local and State regulations?	4150.07: 4.3	Obtain State regulations and Inspect pesticide storage or review agricultural commissioner inspection records.			
If lessee(s) use aerial pesticide application, has the aerial spray	6250.4C: Encl. (1), Para. 13.e.	Review aerial spray validation letter.			

project been reviewed and approved by NAVFAC?					
Pest Management Operations					
What are the installation's top five pests and what are their impacts on the installation?	BMP	Interview pest management service providers and complete pest management project sheets for each pest.			
What survey methods are used to detect, assess, and prescribe treatment for the top five pests?	BMP	Interview pest management service providers and complete pest management project sheets for each pest.			
What non-chemical control methods are used to prevent and control the top five pests?	BMP	Interview pest management service providers and complete pest management project sheets for each pest.			

Key to references:

- 7 U.S.C. § 136 FIFRA
- 4150.07: DODI 4150.07, DOD Pest Management Program
- 1028/8A: MIL-HDBK-1028/8A, Military Handbook, Design of Pest Management Facilities
- 6401.1A: SECNAVINST 6401.1A, Veterinary Health Services
- 6250.4C: OPNAVINST 6250.4C, Navy Pest Management Programs
- 5090.1: OPNAV M-5090.1, Environmental Readiness Program Manual
- 5090.2A: MCO 5090.2A, Environmental Compliance and Protection Manual
- 4200.1: EBUSOPSOFFINST 4200.1 (DON EBusiness Operations Office Instruction), Department of the Navy Policies and Procedures for the Operation of the Government Commercial Purchase Card Program
- FOOD: U.S. Food Code 2013

B.2 INTEGRATED PEST MANAGEMENT PLAN ANNUAL UPDATE FORM

Navy/Marine Corps Integrated Pest Management Plan Annual Update

Fiscal Year Submission Date

1. **Installation**: Please provide the following information about your installation.

Installation Name	**State/Country**	**County(ies), if applicable**	**Year current IPMP was written**

2. **Contact Information**: The following data provides information on installation resources and responsibilities in support of the pest management program. If not applicable, leave blank.

	Name	**E-mail**	**Phone**	**Organization**
Installation Pest Management Coordinator				
Lead Pest Controller				
Primary Pest Management PAR				
Primary Grounds Maintenance PAR				
Lead MWR Golf Course Applicator				
Medical Dept. Representative				
Natural Resource Manager				
Cultural Resource				

Manager				
Public Works Officer				
Installation Environmental Program Manager				

3. **Certification and Training**: List all personnel who have DOD certification or training numbers at your installation. This may include Public Works, MWR and/or Natural Resources personnel. Be sure to include all contractor personnel who apply pesticides (e.g., insecticides, herbicides, etc.) as a part of pest control or grounds maintenance contracts, including those contractor operations performed via credit card or small purchase contracts.

DOD or State Certification	**Type of Work***	**Organization or Contractor Name**	**Applicator Name**	**Applicator Certification/ License Number**	**License Class/Type (i.e., Commercial, Noncommercial, Government, Registered Technician)**	**Certification Category Number(s) or Letter(s)****	**Exp Date MM/DD/YY**
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							
DoD							

*Specify the type of work (e.g., grounds maintenance, pest control, QAE/PAR, IPMC, Natural Resources, etc.)

**Provide a list of all categories of certification

4. **Plan Maintenance**: Please list any minor program changes (e.g., personnel changes, certifications, other programming changes or challenges, etc.) relative to the IPMP for the upcoming fiscal year. Major program changes require re-submittal of the entire updated plan for approval.

5. **Assistance**: Please indicate if you require on-site assistance from a NAVFAC Applied Biologist (Professional Pest Management Consultant) for your pest management program. Briefly describe the reason for such a visit. If you are planning aerial spray or other large scale pest management operations (such as large-scale weed control) please indicate the nature of the project below.

FOR OFFICIAL USE ONLY

IPMP Approved by NAVFAC Professional Pest Management Consultant ☐

Date of Approval: (FY approval)

APPENDIX C

Pesticide Authorized Use List

C.1 PESTICIDE AUTHORIZED USE LIST

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C.1 PESTICIDE AUTHORIZED USE LIST

The following pesticides are authorized for use at NCBC Gulfport as of April 2015.

The most current list of approved pesticides for each installation can be found on the NAVFAC Online Pesticide Reporting System at https://clients.saic.com/PestManagementNET/.

Pesticide Type	Formulation	Pesticide Name	Active Ingredient	EPA Number
Avicide	Bait—Solid	AVITROL WHOLE CORN	4-AMINOPYRIDINE	11649-7
Herbicide	Solution	Accord Concentrate / RODEO	GLYPHOSATE	62719-324
Herbicide	Solution	Blade	metsulfuron methyl	74477-1-2217
Herbicide	Solution	Clearcast	imazimox	241-437-67690
Herbicide	Capsules	Diamondback Capsules	glyophosate	83220-1
Herbicide	Dispersible Granules	DRIVE 75 DF	QUINCLORAC	7969-130
Herbicide	Suspension Concentrate	Drive XLR8	quinclorac	7969-272
Herbicide	Dry Flowable	GALLERY 75 DRY FLOWABLE	ISOXABEN	62719-145
Herbicide	Concentrate	Hi-Yield Killzall Extended Control	Glyphosate/Prodiamine	228-509-7401
Herbicide	Concentrate	High Yield Super Concentrate Killzall	Glyphosate	7401-451
Herbicide	Dust/Granule	Monument 75WG	Trifloxysulfuron-sodium	100-1134
Herbicide	Concentrate	Ornamec	fluazifop-p-butyl	2217-728
Herbicide	Granules/Pellets	Oust XP	Sulfometuron methyl	352-601
Herbicide	Solution	Pathfinder II	Triclopyr	62719-176
Herbicide	Emulsifiable Concentrate	PRAMITOL 25E	PROMETON	100-443-9779
Herbicide	Emulsifiable Concentrate	PRAMITOL 25E	PROMETON	66222-22
Herbicide	Emulsifiable Concentrate	Prosecutor Pro	Glyphosate	524-536-10404
Herbicide	Granules/Pellets	QuikPro	diquat dibromide/glyphosate	524-535
Herbicide	Emulsifiable Concentrate	Ranger Pro	Glyphosate	524-517

Herbicide	Solution	Reward	Diquat Dibromide	100-1091
Herbicide	Liquid	Round Up	glyphosate	71995-25
Herbicide	Emulsifiable Concentrate	ROUNDUP PRO	GLYPHOSATE	524-475
Herbicide	Solution	Roundup Pro Concentrate	Glyphosate	524-529
Herbicide	Solution	RoundUp Ready-to-use Plus	pelargonic acid/glysophate	71995-33
Herbicide	Emulsifiable Concentrate	Speed Zone	2,4-D/Dicamba/Mecoprop-p acid /Carfentrazone-ethyl	2217-835
Herbicide	Liquid	Tower	dimethenamide-P	7969-239
Herbicide	Liquid	Tsunami DQ Diquat	Diquat dibromide	83190-3-72838
Herbicide	Liquid	Vessel	2,4-D/Mecoprop-p/Dicamba	2217-656-72112
Insect Growth Regulator	Briquets	ALTOSID BRIQUET	METHOPRENE	20954-13
Insect Growth Regulator	Granules/Pellets	Altosid Pro-G/ XR-G	Methoprene	2724-451
Insect Growth Regulator	Briquets	ALTOSID XR	METHOPRENE	2724-421
Insect Growth Regulator	Dust/Granule	AWARD	FENOXYCARB	100-722
Insect Growth Regulator	Solution	GENTROL EC IGR	HYDROPRENE	2724-351
Insect Growth Regulator	Aerosol	PRECOR FOGGER	METHOPRENE/permethrin	2724-291-50809
Insecticide	Aerosol	565 Plus XLO	Piperonyl Butoxide/n-Octyl Bicycloheptene Dicarboximide/ Pyrethrins	499-290
Insecticide	Bait Stations	Advance 360A Dual Choice	Abamectin	499-496
Insecticide	Bait Stations	ADVANCE DUAL CHOICE	N-ETHYL PERFLUOROCTANESULFONAMIDE	499-459
Insecticide	Gel	Advion Ant Gel	Indoxacarb	352-746
Insecticide	Gel	Advion Cockroach Gel Bait	Indoxacarb	352-652
Insecticide	Dust/Granule	Advion Fire Ant Bait	Indoxacarb	352-627
Insecticide	Solution	AGNIQUE MMF	POE isooctadecanol	53263-28

Insecticide	Granules/Pellets	Amdro-Pro	Hydramethylnon	241-322
Insecticide	Bait—Solid	Avert Prescription Treatment	Abamectin/Related Compounds	499-294
Insecticide	Gel	Avert Prescription Treatment Cockroach Bait Gel Formula 2	Abamectin	499-406
Insecticide	Gel	Avert Prescription Treatment TC 93B Bait	Abamectin	499-410
Insecticide	Solution	Bed Bug Fix	2-Phenethyl Propionate/ Geraniol/Cedar oil/Eugenol	25 (b) exempt
Insecticide	Aerosol	Bedlam	3-phenoxybenzyl-(1RS, 3RS, 1RS<3RS)-2, 2/N-octyl bicycloheptene dicarboximide	1021-1767
Insecticide	Solution	Bifen I/T	Bifenthrin	53883-118
Insecticide	Granules/Pellets	BIFEN L/P	BIFENTHRIN	53883-124
Insecticide	Dust	Boric Acid	boric acid	56-73
Insecticide	Solution	BP-100	Pyrethrins/PIPERONYL BUTOXIDE /n-Octyl bicycloheptene dicarboximide	499-452
Insecticide	Solution	CY-KICK CS PRECRIPTION TREATMENT	CYFLUTHRIN	499-304
Insecticide	Dust	DELTA DUST	Deltamethrin	432-772
Insecticide	Solution	Demand CS	LAMBDA-CYHALOTHRIN	100-1066
Insecticide	Emulsifiable Concentrate	Demon Max	Cypermethrin	100-1218
Insecticide	Wettable Powder	Demon WP	Cypermethrin	100-990
Insecticide	Liquid*	Dominion 2L	Imidacloprid	53883-229
Insecticide	Liquid*	Drax Liquidator	Orthoboric acid	9444-206
Insecticide	Dust/Granule	drione	Silica gel/PIPERONYL BUTOXIDE/PYRETHRINS	432-992
Insecticide	ULV Concentrate	Evoluer 4-4 ULV	permethrin/PIPERONYL BUTOXIDE	769-982
Insecticide	Gel	Gourmet Ant Bait	Disodium Octaborate Tetrahydrate	73766-1
Insecticide	Solution	Gourmet Liquid Ant Bait	Disodium octaborate tetrahydrate	73766-2
Insecticide	Gel	InTice Smart Ant Gel	borax	73079-9

Insecticide	Gel	InTice Sweet Ant Gel	boric acid	73079-1
Insecticide	Aerosol	INVADER HPX	PROPOXUR	9444-186
Insecticide	Aerosol	Invader Insecticide	phenylmethylcarbamate	279-3395
Insecticide	Aerosol	Konk	Pyrethins/Piperonyl Butoxide	5978-9
Insecticide	ULV Concentrate	KONTROL 4-4	Permethrin/Piperonyl Butoxide	73748-4
Insecticide	Bait—Solid	Max Force Fly Bait	Imidacloprid/Tricosene	432-1375
Insecticide	Bait Stations	MAXFORCE ANT KILLER BAIT STATION	HYDRAMETHYLNON	64248-2
Insecticide	Granules/Pellets	Maxforce Complete Granular Bait	Hydramethylnon	432-1255
Insecticide	Gel	Maxforce FC Magnum Roach Killer Bait Gel	Fipronil	432-1460
Insecticide	Gel	MAXFORCE FC ROACH BAIT GEL	FIPRONIL	432-1259
Insecticide	Bait Stations	MAXFORCE FC ROACH BAIT STATIONS	FIPRONIL	64248-11
Insecticide	Bait Stations	Maxforce FC Roach Killer Bait Stations	Fipronil	432-1257
Insecticide	Bait—Solid	MAXFORCE FINE GRANULE INSECT BAIT	HYDRAMETHYLNON	64248-19
Insecticide	Bait Stations	MAXFORCE ROACH CONTROL SYSTEM	HYDRAMETHYLNON	64248-1
Insecticide	Bait Stations	Maxforce Roach Killer Small Bait Station	Hydramethylnon	432-1251
Insecticide	Dust	Mother Earth D	diatomaceous earth	499-509
Insecticide	Granules/Pellets	NIBAN-FG	ORTHOBORIC ACID	64405-2
Insecticide	Dust/Granule	ORTHENE TURF, TREE AND ORNAMENTAL SPRAY 97	ACEPHATE	5481-8978
Insecticide	Aerosol	PCO Fogger	Pyrethrins/PIPERONYL BUTOXIDE /n-octyl bicycloheptene dicarboximide/Esfenvalerate	9444-166
Insecticide	Aerosol	Perma-Dust	Boric Acid	499-384
Insecticide	Solution	PHANTOM	Chlorfenapyr	241-392
Insecticide	Aerosol	Precor 2000 plus	(s)-Methoprene/Permethrin/ Phenothrin/N-octyl	2724-490

			bicycloheptene dicarboximide/ Piperonyl butoxide	
Insecticide	Emulsifiable Concentrate	PRECOR IGR CONCENTRATE	METHOPRENE	2724-352
Insecticide	Solution	Premise Foam	Imidacloprid	432-1391
Insecticide	Aerosol	PURGE III	Piperonyl Butoxide/Pyrethrins/ N-octyl bicycloheptene dicarboximide	9444-158
Insecticide	Suspension Concentrate	SUSPEND SC	DELTAMETHRIN	432-763
Insecticide	Suspension Concentrate	SUSPEND SC	DELTAMETHRIN	432-763-62719
Insecticide	Granules/Pellets	Talstar XTRA	Zeta-cypermethrin / Bifenthrin	279-9552
Insecticide	Emulsifiable Concentrate	TalstarOne / Talstar P	Bifenthrin	279-3206
Insecticide	Solution	Tempo SC Ultra	Cyfluthrin	432-1363
Insecticide	Granules/Pellets	TERMIDOR 80 WG	FIPRONIL	432-900
Insecticide	Dispersible Granules	Termidor 80WG	Fipronil	7969-209
Insecticide	Solution	TERMIDOR SC	FIPRONIL	432-901
Insecticide	Suspension Concentrate	Termidor SC	Fipronil	7969-210
Insecticide	Dust/Granule	Top Choice	Fipronil	432-1217
Insecticide	Aerosol	TRI-DIE	PYRETHRINS/PIPERONYL BUTOXIDE/ Silica dioxide	499-385
Insecticide	Aerosol	ULD BP-300	Piperonyl Butoxide / n-Octyl Bicycloheptene Dicarboximide/ Pyrethrins	499-450
Insecticide	Aerosol	ULD BP-300	PYRETHRIN/ PIPERONYL BUTOXIDE/N-octyl bicycloheptene dicarboximide	11540-1
Insecticide	Bait—Liquid	Uncle Albert's Super Smart Ant Bait	Disodium octaborate tetrahydrate	83487-1
Insecticide	Bait—Solid	Uncle Alberts Super Smart Ant Bait	Disodium octaborate tetrahydrate	73340-1
Insecticide	Aerosol	Wasp-Freeze	d-trans allethrin/phenothrin	499-362
Insecticide	Aerosol	WHITMIRE PT 566 PYRETHRUM	PYRETHRIN/ ALLETHRIN/ PIPERONYL BUTOXIDE/n-Octyl Bicycloheptene Dicarboximide	499-310
Repellent	Granules/Pellets	Dr. T's Bat-a-Way	Naphthalene	58630-2

		Bird, Squirrel, Rabbit and Bat Repellent		
Repellent, Bird	Gel	4 The Birds Bird Repellent	Polybutene	8254-5-56
Rodenticide	Bait—Solid	CONTRAC ALL WEATHER BLOX	BROMADIOLONE	12455-79
Rodenticide	Bait—Solid	Contrac Rat & Mouse Bait	bromadiolone	12455-75
Rodenticide	Bait—Solid	CONTRAC RAT AND MOUSE BAIT	BROMADIOLONE	12455-36
Rodenticide	Bait—Solid	CONTRAC RODENTICIDE	BROMADIOLONE	12455-69
Rodenticide	Bait—Solid	CONTRAC RODENTICIDE PLACE PAC	BROMADIOLONE	12455-76
Rodenticide	Bait—Solid	CONTRAC RODENTICIDE PLACE PAC	BROMADIOLONE	12455-86
Rodenticide	Bait—Solid	EATONS BAIT BLOCKS	DIPHACINONE	56-42
Rodenticide	Granules/Pellets	GENERATION PELLETS PLACEPACKS	DIFETHIALONE	7173-206
Rodenticide	Bait—Solid	Maki Paraffin Blocks	Bromadiolone	7173-189
Rodenticide	Granules/Pellets	MAKI RAT AND MOUSE BAIT PACKS	BROMADIOLONE	7173-188
Rodenticide	Granules/Pellets	Talon G	Brodifacoum	100-1050
Rodenticide	Bait—Solid	ZP RODENT BAIT	ZINC PHOSPHIDE	12455-18

APPENDIX D

Certifications

D.1 TABLE OF CURRENT CONTRACTORS

D.2 TABLE OF APPLICATOR AND INTEGRATED PEST MANAGEMENT COORDINATYOR/PERFORMANCE ASSESSMENT REPRESENTATIVE CERTIFICATIONS

(Update as necessary).

D.3 INTEGRATED PEST MANAGEMENT COORDINATOR APPOINTMENT LETTER

(Insert here when available).

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D.1 CURRENT CONTRACTORS

Contractor	Type of Work
GSE Facility Services	Grounds maintenance
Redd Pest Solutions	Pest control (Subway)
Knox Pest Control	Pest control (PPV)
Davey Tree Expert Company	Landscaping (PPV)

D.2 PESTICIDE APPLICATOR AND INTEGRATED PEST MANAGEMENT COORDINATOR/PERFORMANCE ASSESSMENT REPRESENTATIVE CERTIFICATIONS

DOD or State	Organization or Contractor Name	Name	Applicator Cert Number	Cert Category Number*	Expiration Date
DOD	PWD	Nichols, Danny	IPMC	n/a	3/31/18
DOD	PWD	Brooks, Cynthia	PAR	n/a	5/31/16
DOD	PWD	Cornell, Scott	NJ-002-10-0813	3,5,6,7,8	8/31/16
DOD	Natural Resources	Fannaly, Marion	NJ-026-11	2,3,5,6	3/31/18
State	GSE	Carter, Mims	CA10809	VII-3	1/19/17
DOD	PREVMED	HMC Guimary, Raquel			
DOD	PREVMED	HM3 Albury	M-207-12		8/31/15
DOD	Battalion Corpsman	HM2 Goodwin, C.	NS-057-10-0414	8	4/30/17
*See Table 2-1					

D.3 INTEGRATED PEST MANAGEMENT COORDINATOR APPOINTMENT LETTER

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APPENDIX E

Laws

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E.1 FEDERAL LAWS, REGULATIONS, POLICIES, AND GUIDANCE RELATED TO PESTICIDES AND PEST MANAGEMENT

FEDERAL

Title/Reference	Date	Relevant Requirements / Guidance
Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C 136 et seq.) *http://www.law.cornell.edu/uscode/text/7/chapter-6/subchapter-II* (codified at 40 CFR Parts 152-180 *http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr152_main_02.tpl)*	1947, and amendments	Requires pesticide and applicator registration with the U.S. EPA, properly labeled containers, pesticide application records, adequate worker safety, and the proper disposal of unused products. Pesticides are also classified under this act as general use or restricted use.
Integrated Pest Management for Federal Agencies (7 USC § 136R–1) *http://www.law.cornell.edu/uscode/text/7/136r-1*		Requires Federal agencies to use IPM techniques in carrying out pest management activities and promote IPM.
National Environmental Policy Act (NEPA) (42 USC 4321-4347) *http://www.nepa.noaa.gov/statute.html*	1969	Requires a detailed environmental impact statement for any major federal action that can significantly affect the environment. This may include pest management operations that involve large areas of land, application of chemicals to waterways and aerial application of pesticides.
Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements *http://www.archives.gov/federal-register/executive-orders/pdf/12856.pdf*	3 Aug 1993	The head of each Federal agency is responsible for ensuring that all necessary actions are taken for the prevention of pollution with respect to that agency's activities and facilities, and for ensuring that agency's compliance with pollution prevention and emergency planning and community right-to-know provisions.
Executive Order 13148, Greening the Government Through Leadership in Environmental Management *http://www.epa.gov/epp/pubs/eo13148.pdf*	21 April 2000	Requires that the head of each Federal agency ensures that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Each agency shall strive to reduce or eliminate harm to human health and the environment from releases of pollutants, such as pesticides, to the environment.

Federal Noxious Weed Act (7 USC 2801) incorporated into the Plant Protection Act *http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/sec2814.pdf*	FNWA 1974 PPA 2000	Requires federal agencies to develop and implement noxious weed management programs on federal land.
Resource Conservation and Recovery Act (RCRA) *http://www4.law.cornell.edu/uscode/42/6901.html* (42 USC 6901 et seq.) (40 CFR § 260-265)	1976, amended in 1986	Requires proper disposal of waste pesticides and pesticide containers.
Non-indigenous Aquatic Nuisance Prevention and Control Act (16 USC 4700 et seq.) *http://www.anstaskforce.gov/Documents/nanpca90.pdf*	1990	Espouses taking preventive management measures nationwide to prevent and control unintentionally introduced non-indigenous aquatic species and prevent further distribution of these species.
Food Quality Protection Act (FPQA), Section 303 *http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCAct/SignificantAmendmentstotheFDCAct/ucm148008.htm*	1996, amendment to FIFRA and FDCA	Mandates that federal agencies use IPM techniques in pest management activities and promote IPM through procurement and regulatory policies. Primarily established safety standards for pesticides applied to foods.
Executive Order 13112, Invasive Species *http://www.invasivespeciesinfo.gov/laws/execorder.shtml*	3 Feb 1999	Institutes measures to prevent the introduction of invasive species, provide for their control using environmentally sound techniques, and minimize the economic, ecological, and human health impacts caused by invasive species.
Clean Air Act (CAA) (42 USC 7401 et seq.) *http://www.epa.gov/air/caa/*	1955, amended in 1970, 1977, and 1990	Mandates the prevention and control of air pollution from toxic emissions including pesticides.
Animal Damage Control Act (7 USC 426-426c) *http://www.animallaw.info/statutes/stusfd7usc426.htm*	1931, amended in 1987 and 1991	Gives the Secretary of Agriculture broad authority to investigate and control certain predatory or wild animals and nuisance mammal and bird species.
Migratory Bird Treaty Act *http://www.fws.gov/alaska/ambcc/ambcc/treaty_act.htm*	1918, with numerous amendments	Requires permits to take migratory birds.
OSHA Hazard Communication Standard (29 CFR 1910) *http://www.osha.gov/dsg/hazcom/standards.html*	1970	Stipulates the requirements for applicable and adequate training of all employees regarding hazardous substances (including pesticides) and providing access to SDSs for all chemicals.

Endangered Species Act (16 USC 1531-1544), (50 CFR Part 402) *http://www.fws.gov/laws/lawsdigest/ESACT.html* Federal list of endangered/ threatened plants and wildlife is at 50 CFR §§ 17.11 & 17.12 *http://www.fws.gov/endangered/*	1973, amended in 1978	Dictates that all federal agencies must protect listed plants and animals and their habitats from harm. Indicates that pesticide formulations and application methods be reviewed by the U.S. Fish and Wildlife Service to determine whether there could be adverse effects.
Endangered Species Protection Bulletins *http://www.epa.gov/espp/bulletins.htm*		Bulletins set forth geographically-specific *pesticide use limitations* for the protection of endangered or threatened species and their designated critical habitat.
Sikes Act Improvement Act (SAIA) (16 USC 670) *http://www.fws.gov/habitatconservation/sikes_act.html*	31 Dec 2003	Authorizes the Secretary of Defense to develop cooperative plans for conservation and rehabilitation programs on military reservations and modify or improve habitat for endangered species and migratory birds. This includes authorizing the elimination of noxious weeds in efforts to rehabilitate native species.
Toxic Substances Control Act (TSCA) (15 USC 2601 et seq.) *http://www.epa.gov/oecaagct/lsca.html*	1976	Requires that new chemicals, including pesticides, be registered and that testing for human health and environmental hazards be performed.
Clean Water Act (Amended the Federal Water Pollution Control Act of 1972) (33 USC 1251-1387) *http://www.law.cornell.edu/uscode/text/33/chapter-26*	1977, reauthorized in 1987	Calls for the restoration and maintenance of the chemical, physical, and biological integrity of our nation's waters, including sensitive environments like wetlands. This Act prohibits non-storm water discharges from entering surface waters.
National Pollution Discharge Elimination System (NPDES)— EPA General Permit *http://cfpub.epa.gov/npdes/home.cfm?program_id=410* Covers the following states: AK, ID, NH, NM, OK, DC, and federal facilities in WA, CO, DE, and VT.		Operators that apply pesticides that result in discharges from the following use patterns may have to submit a notice of intent (NOI) and create a Pesticide Management Discharge Plan (PMDP) if they meet certain criteria: (1) mosquito and other flying insect pest control; (2) weed and algae control; (3) animal pest control; and (4) forest canopy pest control

United States Public Health Service (USPHS)/Food and Drug Administration (FDA) Food Code *http://www.fda.gov/food/guidanceregulation/retailfoodprotection/foodcode/default.htm*	2001	Provides regulations on pest control methods, application of pesticides, removal of dead animal pests from food retail sales establishment, and display of pesticides for retail sale. It also provides food inspection guidelines and inspection forms. This is the primary guideline used by Defense Commissary Agency (DeCA) food inspectors for ensuring food safety in the Commissary.

E.2 DEPARTMENT OF DEFENSE LAWS, REGULATIONS, POLICIES, AND GUIDANCE RELATED TO PESTICIDES AND PEST MANAGEMENT

DEPARTMENT OF DEFENSE

Title/Reference	Date	Relevant Requirements/Guidance
DOD Instruction 4150.07, DOD Pest Management Program *http://www.afpmb.org/sites/default/files/pubs/directives_mous/DOI4150.07.pdf*	29 May 2008	Sets policies, responsibilities, and procedures for implementing an environmentally sound IPM program to control pests and ensure installations develop, maintain, and review their pest management plans.
DOD 4150.07-M, Volume 1, DOD Pest Management Training: The DOD Plan for the Certification of Pesticide *http://www.afpmb.org/sites/default/files/pubs/directives_mous/415007m_vol1.pdf*	23 May 2013	Outlines the DOD procedures for pest management training and certification of pesticide applicators.
DoD Manual 4150.07, Volume 2, DoD Pest Management Training and Certification Program: The DoD Plan for Non-Federal Insecticide, Fungicide, and Rodenticide Act Pesticide Applicators *http://www.afpmb.org/sites/default/files/pubs/directives_mous/415007m_vol2.pdf*	23 May 2013	Assigns responsibilities and sets procedural requirements for non-FIFRA training and certification.
DOD 4150.07-M, Volume 3, DOD Pest Management Training and Certification Program: The DOD Plan for FIFRA Pesticide Applicators *http://www.afpmb.org/sites/default/files/pubs/directives_mous/415007m_vol3.pdf*	23 May 2013	Outlines the DOD procedures for pest management training of IPMCs and PARs.

DOD Directive 4715.1E, Environmental Security *http://www.dtic.mil/whs/directives/corres/pdf/471501p.pdf*	19 March 2005	Establishes the AFPMB which provides information, guidance, and publications related to pest and pesticide management. Also advocates implementing IPM into DOD acquisition, procurement, maintenance, and repair processes for systems, equipment, facilities, and land.
DOD /EPA MOU with Respect to IPM *http://www.afpmb.org/sites/default/files/pubs/directives_mous/MOU-DOD-Epa.pdf*	March 1996	Adopts integrated pest management strategies to reduce the potential risks to human health and the environment associated with pesticides.
DOD D/USDA Master MOU *http://www.afpmb.org/sites/default/files/pubs/directives_mous/MOU-DOD-USDA.pdf*	14 Mar 2003	Indicates that these agencies will work together and meet regularly to discuss such mutual interests as pest management, forestry, and wildlife activities.
DOD /USDA MOU—Animal Damage Assessment and Control *http://www.afpmb.org/sites/default/files/pubs/directives_mous/MOU-DOD-USDA-Aphis.pdf*	15 May 1990	Establishes procedures for planning, scheduling and conducting animal damage control activities exclusive of routine vertebrate pest control operations.
Armed Forces Pest Management Board Technical Guides *http://www.afpmb.org/content/technical-guides*		DOD-specific guidance on various pest management and pesticide-related topics.

E.3 DEPARTMENT OF THE NAVY LAWS, REGULATIONS, POLICIES, AND GUIDANCE RELATED TO PESTICIDES AND PEST MANAGEMENT

DEPARTMENT OF THE NAVY		
Title/Reference	**Date**	**Relevant Requirements/Guidance**
OPNAVINST 6250.4C, Pest Management Programs	11 April 2012	The Navy policy that implements DOD's Pest Management Program. Provides policy specific to Navy operations. This includes record keeping, reporting, safety, management of contracted operations, pest management plans, and environmental protection. Provides responsibilities for preventive medicine.
OPNAVINST 5090.1D, Environmental Readiness Program	10 Jan 2014	Overarching document implementing OPNAV M-5090.1.

OPNAV M-5090.1, Environmental Readiness Program Manual (Chapter 24—Pesticide Compliance Ashore)	10 Jan 2014	Generally requires all pesticide applicators to be DOD- or state-certified. In addition, pest management records must be kept and a pest management plan developed, implemented, and maintained that stresses the importance of IPM.
OPNAVINST 5100.23G, Navy Occupational Safety and Health (NAVOSH) Program	11 July 2011	Requires that pest control operations be thoroughly evaluated to identify and quantify potential health hazards.
NAVMED P-5010, Manual of Naval Preventive Medicine Chapter 8—Navy Entomology and Pest Control Technology	9 Nov 2004	Guidelines and procedures on the prevention, surveillance, and control of medically important pests.
OPNAVINST 6210.2, Quarantine Regulations of the Navy	29 June 2006	Delineates the Navy and Marine Corps responsibility to prevent the introduction of medically and economically important pests into the United States

E.4 STATE LAWS, REGULATIONS, POLICIES, AND GUIDANCE RELATED TO PESTICIDES AND PEST MANAGEMENT

STATE OF MISSISSIPPI

Title/Reference	Date	Relevant Requirements/Guidance
Mississippi Pesticide Law Sections 69-23-1 through 69-23-27		Requires the registration of all pesticides sold or distributed within the state and the licensing of dealers of restricted-use pesticides.
Mississippi Pesticide Application Act Sections 69-23-101 through 69-23-133		Pesticides classified as restricted-use may be applied only by or under the supervision of certified applicators.
Agricultural Aviation Law Sections 69-21-101 through 69-21-128	2009	Regulates and licenses all aerial applicators and aircrafts engaged in the application of pesticides, poisons, seeds, fertilizer, and chemicals.
Mississippi Aquaculture Act Section 79-22-9	1998	MDAC has authority to regulate the cultivation and marketing of certain aquatic products.
Laws of Mississippi Sections 69-25-1 through 69-25-47	1974	MDAC has authority to regulate noxious weeds.

APPENDIX F

Environmental

F.1 SAMPLE PESTICIDE MANAGEMENT PROGRAM ENVIRONMENTAL IMPACT LOG

F.2 SAMPLE PESTICIDE DISCHARGE MANAGEMENT PLAN

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F.1 SAMPLE PESTICIDE MANAGEMENT PROGRAM ENVIRONMENTAL IMPACT LOG

Practice	Practice Owner	Aspects	Impacts	Vulnerable Assets
Pesticide storage	Pest control shop supervisor	Potential spill	Degradation of water quality Human exposure to chemicals	Environmental resources Human health and safety
	Pest control shop supervisor	Fire	Risk of human injury due to fire and chemicals Degradation of air quality	Human health and safety Environmental resources
Pesticide transportation	Pesticide applicator / transporter	Potential spill due to container damage	Degradation of water and soil quality Property contamination	Real property Mission Human health and safety Public perception
	Vehicle owner	Air emissions from vehicle	Degradation of air quality	Environmental resources
Pesticide mixing	Pesticide mixer / applicator	Potential spill	Degradation of water and soil quality	Environmental resources
	Pesticide mixer / applicator	Hazardous waste generation	Cost of disposal	Mission
	Pesticide mixer / applicator	Chemical mixing	Exposure to toxic chemicals	Human health and safety
Pesticide application	Pesticide applicator	Potential spill	Degradation of water and soil Exposure to toxic chemicals	Natural resources Human health and safety
	Pesticide applicator	Pesticide drift	Killing of non-target plants and animals	Natural resources
	Pesticide applicator	Stormwater discharge	Degradation of water	Natural resources
	Pesticide applicator	Air emissions from gas powered application equipment	Degradation of air quality	Environmental resources
	Pesticide applicator	Vehicle use for pesticide application	Damage to plants and animal habitats if off road	Natural resources
	Pesticide applicator	Hazardous waste generation	Cost of disposal Exposure to toxic chemicals	Mission Human health and safety
	Pesticide applicator	Chemical usage	Exposure to toxic chemicals	Human health and safety Environmental resources
Cleaning pesticide application equipment at application site and in pest control shop	Pesticide applicator	Waste water generation	Degradation of water quality Cost of treatment/disposal	Mission
Pesticide container disposal	Pest control shop supervisor	Solid hazardous waste generation	Cost of disposal	Mission
	Pest control shop supervisor	Waste water generation	Degradation of water quality Cost of treatment/disposal	Environmental resources Mission
Non-chemical control: mechanical weed removal	Grounds maintenance workers	Root damage to native plants	Destruction of natural resources	Natural resources
Non-chemical control: animal trapping	Pest control operator	Animal relocation	Potential destruction of natural resources	Natural resources
	Pest control operator	Trapped animal	Human or domestic animal injury caused by trapped animals	Human and domestic animal health and safety

F.2 SAMPLE PESTICIDE DISCHARGE MANAGEMENT PLAN

Pesticide Discharge Management Plan

Instructions

If you are required to submit an NOI (see table 1 below), you must prepare a PDMP for your pest management area within the deadlines described below (table 2). This plan must be kept up-to-date. The EPA's general permit can be accessed at: http://www.epa.gov/npdes/pubs/proposed_pgp.pdf.

Pesticide Use	Annual Threshold
Mosquitoes and Other Flying Insect Pests	6,400 Acres of treatment area
Aquatic Weed and Algae Control:	
-In Water	80 Acres of treatment area*
-At Water's Edge:	20 linear miles of treatment area at water's edge+
Aquatic Nuisance Animal Control:	
-In Water	80 Acres of treatment area*
-At Water's Edge	20 linear miles of treatment area at water's edge+
Forest Canopy Pest Control	6,400 Acres of treatment area

*Calculations should include the area of the applications made to: (1) waters of the U.S. and (2) conveyances with a hydrologic surface connection to waters of the U.S. at the time of pesticide application. For calculating annual treatment area totals, count each pesticide application activity as a separate activity. For example, applying pesticides twice a year to a ten acre site should be counted as twenty acres of treatment area.

+Calculations should include the linear extent of the applications made at water's edge adjacent to: (1) waters of the U.S. and (2) conveyances with hydrologic surface connection to waters of the U.S. at the time of pesticide application. For calculating annual treatment totals, count each pesticide application activity and each side of a linear water body as a separate activity or area. For example, treating both sides of a ten mile ditch is equal to twenty miles of water treatment area.

Table 1. Annual Treatment Area Thresholds

Category	PDMP Deadline
Operators are not required to submit an NOI.	Not applicable.
Operators who know or should have reasonably known, prior to commencement of discharge, that they will exceed an annual treatment area threshold for that year.	Prior to first pesticide application covered under the permit.
Operators who do not know or would reasonably not know until after commencement of discharge that they will exceed an annual treatment area threshold for that year.	Prior to exceeding an annual treatment area threshold.
Operators commencing discharge in response to a declared pest emergency situation that will cause the operator to exceed an annual treatment area threshold.	No later than 90 days after responding to the declared pest emergency situation

Table 2. Pesticide Discharge Management Plan deadlines

Pesticide Discharge Management Plan
For
Pest Management Area:

A. Pesticide Discharge Management Team

The following person will be responsible for managing pests in relation to the specified pest management area:

Name	Title	Department/Division	Phone	Email

The above person is responsible specifically for:

The following person will be responsible for developing and revising the PDMP:

Name	Title	Department/Division	Phone	Email

The above person is responsible specifically for:

The following person will be responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements:

Name	Title	Department/Division	Phone	Email

The above person is responsible specifically for:

The following person(s) will be responsible for pesticide applications in the specified pest management area:

Name	Title	Department/Division	Phone	Email

The above person(s) is/are responsible specifically for:

The pesticide applications for the specified pest management area are performed by:

In-House Personnel	☐	Contractor Personnel	☐	In-House and Contractor Personnel	☐

If contractor personnel perform the pesticide applications, attach a copy of the contract or other written agreement to this PDMP. Document attached? Yes ☐ No ☐ Not applicable ☐

B. Pest Management Area Description

1. Pest Problem Description

Target Pest(s):

Source of Pest/Root Cause of Pest Problem:

Historical information regarding this pest problem in this area:

Source and location of historical data:

2. Action Threshold

Established Pest Action Threshold (reference IPMP and/or Contract, if applicable):

3. Map

Attach a map of the pest management area. Map attached. Yes ☐ No ☐

4. Water Quality Standards

Established Water Quality Standards for waters of the U.S. located in this pest management area to which there may be a discharge (provide reference from State or other source):

C. Control Measure Description

Select control measures that you will implement to comply with effluent limitations. Further details will be provided in Section D.

☐ Active Ingredient(s) to be applied to the pest management area (attach pesticide label):

☐ Rate of application (provide rate):

☐ Frequency of application (provide frequency):

☐ Spill Prevention

☐ Equipment Maintenance and Calibration

D. Schedules and Procedures

1. Control Measures Used to Comply with Effluent Limitations

For all of the following provide justification, procedures and schedules, as appropriate. Reference the IPMP, other installation Plans, SOPs, manufacturer's directions or any

other applicable documents. Procedures do not need to be re-written here if they are clearly delineated in another planning document and the document is referenced.

Rate of application:

Spill Prevention:

Pesticide Application Equipment Maintenance:

Pest Surveillance:

Assess Environmental Conditions Prior to Application (temperature, precipitation, wind speed):

2. Other Actions Necessary to Minimize Discharges

Spill Response Procedures

Provide information on and/or reference existing plans for the following:

Spill Response Procedures:

Spill-related Training/Certification:

Notification Procedures:

Adverse Incident Response Procedures

Provide information on and/or reference existing plans for the following:

Incident Response Procedures:

Notification Procedures:

Locations where Contact Information for Responders can be Found:

Pesticide Monitoring Schedules and Procedures

"Monitoring" includes checking that the amount of pesticide applied is correct, performing regular maintenance on equipment and spot checking for observable adverse incidents. Visual assessments of the application site must be performed during pesticide applications and during post-application surveillance.

Process for determining monitoring locations:

Schedule for monitoring:

Person(s) responsible for monitoring:

Procedures for documenting any observed impacts:

E. Documentation to Support Eligibility Considerations under Other Federal Laws

Have you included a copy of your NOI with this PDMP? Yes ☐ No ☐

F. Signature

This PDMP must be signed by "either a principal executive officer or ranking elected official (i.e., a Chief Executive Officer of the Agency or a Senior Executive Officer having responsibility for the overall operations of a principal geographic unit of the agency)."

Signature: _____
Name:
Title:

APPENDIX G

Medical

G.1 EMERGENCY VECTOR SURVEILLANCE AND CONTROL PLAN FOR NAVAL CONSTRUCTION BATTALION CENTER GULFPORT

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G.1 EMERGENCY VECTOR SURVEILLANCE AND CONTROL PLAN FOR NAVAL CONSTRUCTION BATTALION CENTER GULFPORT

APPENDIX TO NAVAL CONSTRUCTION BATALLION CENTER GULFPORT
PEST MANAGEMENT PLAN

EMERGENCY VECTOR SURVEILLANCE
AND CONTROL PLAN

JUNE 2008

Ref: (a) OPNAVINST 6250.4B
(b) DOD Directive 4150.7
(c) BUMEDINST 6250.12C

Encl: (1) Personnel to be contacted when implementing Emergency Disease Vector Plan.
(2) List of higher echelon commands to be notified of plan implementation.
(3) Environmental factors impacting emergency vector control.
(4) Vector-borne diseases, anticipated vectors, and non-disease causing nuisance pests.
(5) Mosquito species producing West Nile Virus positives.

1. Purpose: To establish an emergency vector control plan for: Naval Construction Battalion Center Gulfport (NCBC).

2. Background:

(a) General: NCBC is surrounded by agricultural, residential and commercial areas, with some settling areas, storm water ponds, and pools areas. This region produces mild to moderate numbers of pestiferous insects, which may potentially expose personnel in field exercises, base workers and residents to vector-borne diseases. NCBC's Pest Management Plan cannot cope with exceptionally large vector populations produced in the wake of widespread flooding from abnormally severe weather conditions, or with the need for extensive spraying required to arrest a vector-borne disease outbreak. Because these events would cause problems affecting the entire area, the Naval Branch Health Clinic (NBHC) Gulfport, in concert with Naval Hospital Pensacola Preventive Medicine Department, is responsible for initiating emergency surveillance and control measures when vector populations suddenly increase or a vector-borne disease outbreak is imminent, as prescribed in references (a) and (b). This Emergency Vector Control Plan is developed in

coordination with the Navy Entomological Center of Excellence (NECE), Jacksonville, Fl.

3. Pest/Vector description:

a. Mosquitoes: Mosquitoes are very common from April until December. The adult mosquito is a small and fragile insect with slender abdomen, one pair of narrow wings, three pairs of long, slender legs, and a long proboscis through which they feed. They have four distinct stages in their life history: the egg, larva, pupa and adult. The first three stages occur in water, but the adult is an active, flying insect. Males feed exclusively on plant fluids, whereas females also feed on human and animal blood, making them responsible for animal and human disease transmission.

Methods of Control:

(1) Surveillance and Larviciding: to ensure decreasing mosquito populations, seasonal surveillance of all areas of standing and impounded water should begin (or continue) even when ambient temperature is not satisfactory for viral development in vectors but adult vectors are (or become) active but not yet abundant. Use environmentally friendly larvicides at specific sources identified by entomologic survey (dipping counts). The efficient use of larvicides should reduce or delay the requirement to supplement with adulticide evolutions.

(2) Adulticides: when the adult female mosquito population reaches the established threshold and/or seroconversion of sentinel animals occurs, the necessity for minimizing disease transmission by mosquitoes requires the immediate control of the adult stage. This is best accomplished with efficient and targeted use of environmentally safe insecticides. Use of ground application devices and aerial spray methods may be required in order to effectively cover all of NCBC's populated areas, as well as surrounding vector-breeding sites.

b. Rodent Associated Diseases: Natural disasters may result in rodents seeking shelter in buildings occupied by humans. This can potentially result in disease transmission.

Methods of Control:

(1) IPM: Integrated Pest Management plan should include surveys, exclusion, sanitation, baiting and trapping.

c. Fly Associated Diseases: In the aftermath of natural disasters, rapid increases in fly populations can pose a significant health risk. The increase in decaying organic material, possible sewage system malfunction and decreased levels of sanitation provide ideal breeding habitats for flies.

Methods of Control:

(1) Sanitation: Control measures should focus on rapidly restoring sanitation infrastructure to include solid waste storage and disposal; integrity of sewage systems.

(2) Integrated Pest Management: Integrated Pest Management plan should include sanitation, surveys, exclusion and trapping.

(3) Exclusion: from foodservice areas.

(4) Baiting.

(5) Aerosolized pesticides.

4. Action.

a. The Commanding Officer, NCBC, upon the advice of the Officer in Charge, NBHC Gulfport in concert with the Naval Hospital Pensacola Preventive Medicine Department (see CDC Arboviral Mosquito Vector Surveillance Risk Category and Response Recommendations) will:

(1) Notify the tenant command that the Emergency Vector Control Plan be initiated.

(2) Inform, via message, the appropriate chain-of-command when the Emergency Vector Control Plan is activated.

b. The Officer in Charge, NBHC shall request consultation from the Head, Preventive Medicine, Naval Hospital Pensacola to ensure:

(1) Disease specific symptoms are provided to the medical staff to ensure potential vector borne diseases are ruled out in the differential diagnosis for patients presenting with like symptoms.

(2) Ensure the timely submission of a Disease Event Report, utilizing the Navy Disease Reporting System, should

there be any suspected or confirmed cases of vector-borne disease.

(3) Maintain appropriate epidemiological surveillance of vector-borne diseases and vector populations prior to, and throughout the emergency. Surveillance will be in cooperation and partnership with the Harrison County Mosquito Control Program Manager and Health Department Director.

(4) Coordinate overall mosquito abatement activities onboard:

(a) Utilize clinic owned mosquito traps for surveillance (collections will be performed Monday through Thursday and will be checked on the following days).

(b) Ensure that Preventive Medicine Technician(s) maintains certification as Category 8, DoD Pest Control Operators.

(c) Ensure identification of mosquito catch to Genus and species. If assistance and/or additional training is necessary, Harrison County Mosquito Control Program Manager will provide "Hands on Training".

(d) Taxonomy will be accomplished on the day of trap collection. Identification will be to species.

(e) The action level will be 15 female mosquitoes per trap/night, or 5 or more of suspected disease vectors if an outbreak is present in the area.

(f) Trap counts exceeding 15 mosquitoes will be justification for Preventive Medicine to instruct the Public Works Department (PWD) to initiate Ultra Low Volume (ULV) spraying within a one (1) mile radius area of the trap.

(g) Coordinate with PWD to have contractor perform mosquito control. In the event of plan activation, PWD and Preventive Medicine will, to all extent possible, establish a partnership with Harrison County in a joint effort for mosquito control and eradication.

(h) Notify the Officer in Charge, NECE of the situation and request their assistance in providing consultation, aerial and ground dispersal equipment and personnel certified in aerial application of pesticides.

(i) Provide personnel as may be necessary to conduct an effective, emergency mosquito abatement program.

(j) Determine availability of adequate insecticides from local sources.

(k) Maintain liaison with Naval Hospital Pensacola and NCBC's Public Affairs Officers to coordinate press releases and dissemination of information to the public.

(l) When required, prepare information sheets to distribute to base personnel advising of personal protective measures, breeding site reduction instructions and procedures for collection and submission of dead or dying birds.

(m) Maintain liaison with Harrison County Mosquito Control and Health Department officials to share information and to coordinate efforts.

c. NECE (Jacksonville, FL) will, if deemed by appropriate authority:

(1) Establish and deploy an Emergency Vector Control Team.

(2) Establish appropriate vector control procedures and direct all vector control activities for the duration of the emergency.

(3) Inform the Commanding Officer, NCBC, Commanding Officer, Naval Hospital Pensacola and the Officer IN Charge, NBHC Gulfport of the status of all control activities.

5. Post-emergency action. A detailed After Action Report will be prepared jointly by NECE and Officer in Charge, NBHC Gulfport for submission to the Navy and Marine Corps Public Health Center and BUMED. It should include specifics on:

a. Vectors involved and population densities.

b. Control measures taken.

c. Effectiveness of methods used and methods of determination.

d. Problems encountered and suggestions on corrective action.

EMERGENCY VECTOR SURVEILLANCE AND CONTROL PLAN

Risk Category	Probability of Outbreak	Definition	Recommended Response
0	Negligible or None	• Off-season; • Adult vectors inactive; • Climate unsuitable	• None required; • Pursue source reduction and • Pursue public education activities.
1	Remote	• Spring, Summer, or Fall; • Adult vectors active but not abundant; • Ambient temperature not satisfactory for viral development in vectors	• Source reduction; • Use larvicide's at specific sources identified by entomologic survey; • Maintain vector and virus surveillance. • Coordinate with local area mosquito control districts or state public health organization for information exchange
2	Possible	• Focal abundance of adult vectors; • Temperature adequate for extrinsic incubation; • Seroconversion in sentinel hosts	• Response from category 1 plus; • Increase larvicide's use in/near urban areas; • Initiate selective adulticide use; • Initiate public information programs (recommending the use of personal protection). • Increase vector and virus surveillance
3	Probable	• Abundant adult vectors in most areas; • Multiple virus isolations from ensootic hosts or a confirmed human or equine case; • Optimal conditions for extrinsic incubation and vector survival; • These phenomena occur early in the 'normal' season for viral activity	• Implement emergency control contingency plan; • Response in category 2 plus; • Adulticiding in high risk areas; • Expand public information programs (use of repellents, personal protection, avoidance of high vector contact areas); • Initiate hospital surveillance for human cases
4	Outbreak in Progress	• Multiple confirmed cases in humans	• Continue with emergency control contingency plan; • Concentrate available resources on strong Adulticiding efforts over areas at risk; • Hold daily public information briefings on status of epidemic; • Continue emphasis on personal protection measures; • Maintain surveillance of vector/virus activity, human cases

Note: Response table taken from CDC C. G. Moore; et al *Guidelines for Arbovirus Surveillance Programs in the United States* (April 1993) (Division of Vector-Borne Infectious Diseases National Center for Infectious Diseases Centers for Disease Control and Prevention Public Health Service U. S. Department of Health and Human Services Fort Collins, Colorado). Table 1.1. Definitions and stepwise response for risk categories for mosquito-borne arborviral disease outbreaks in the United States. Risk categories are tentative and approximate. Local and regional characteristics may alter the risk level at which specific actions must be taken.
Note: Changes and additions from the original table were done to standardize naval activities in accordance with current instructions and practices.

PERSONNEL TO BE CONTACTED WHEN IMPLEMENTING THE EMERGENCY PLAN FOR DISEASE VECTOR AND PEST CONTROL

1. Commanding Officer, NCBC
   Phone: (228) 871-3321

2. Officer in Charge, NBHC Gulfport
   Phone: (228) 871-3364

3. Commanding Officer, Naval Hospital Pensacola
   Phone: (850) 505-6601

4. Head of Preventive Medicine Department, Naval Hospital Pensacola
   Phone: (850) 452-5242

5. Pest Control Supervisor, PWD Gulfport
   Phone: (228) 871-2244

6. Director, Harrison Mosquito Control
   Phone: (228) 896-0409

Enclosure (1)

LIST OF HIGHER ECHELON PERSONNEL TO BE CONTACTED WHEN IMPLEMENTING THE EMERGENCY PLAN FOR DISEASE VECTOR AND PEST CONTROL

1. Navy and Marine Corps Public Health Center
   620 John Paul Jones
   Cir, Ste. 1100
   Portsmouth, VA 23708-2103
   DSN: 377-0700, Commercial (757) 621-0700
   FAX (757) 953-0685

2. Navy Entomological Center of Excellence
   Naval Air Station, Box 43
   Jacksonville, FL 32212-0043
   DSN: 942-2424, Commercial (904) 542-2424
   FAX: (904) 542-4324

3. Navy Environmental and Preventive Medicine, Unit No.2
   1887 Powhatan Street
   Norfolk, VA 23511-3394
   DSN: 564-7671, Commercial (757) 444-7671
   FAX: DSN 564-1191, Commercial (757) 444-1191

Enclosure (2)

VECTOR-BORNE DISEASES, ANTICIPATED VECTORS, AND NON-DISEASE CAUSING NUISANCE PESTS

1. West Nile Virus

a. Primary Vectors: *Culex pipiens, Cx. restuans and Cx. salinarius* are thought to be the primary vectors.

c. Vector Bioeconomics: *Cx.* lays egg rafts in rain barrels, water tanks, cisterns, and temporary pools, but water having high organic content is preferred. Large populations of the species are common in urbanized areas. Adults of *Cx.* feed primarily at night both indoors and out. They readily bite humans but prefer birds.

d. Control Measures: Restrict outdoor activity, stress personal protective measures. Identify breeding sites through surveillance (light trapping, larval dips). Treat adults with aerial/ground ULV. Treat larvae chemically with larvicides. When feasible, reduce or eliminate breeding sites mechanically. Maintain constant liaison with County Mosquito Control Program Manager and local Health Department Infectious Disease Division and Agriculture officials to obtain area information about disease threat. Include surveillance for dead birds (especially crows). Coordinate veterinary surveillance and submission of dead bird for testing with local Army Veterinarian. Enhance human surveillance at all military medical treatment facilities.

2. Dengue Fever/Dengue Hemorrhagic Fever.

a. Primary Vectors: *Ae. Aegypti*

c. Vector Bioeconomics: Breeds almost exclusively in artificial containers that are found in association with man, such as discarded automobile tires, drums, and animal watering vessels. Also occasionally found in natural containers such as leaf axils. Immatures and adults found indoors and out. Adult female mosquitoes are diurnally active and will readily feed on man and other animals. The flight range is limited.

d. Control Measures: Restrict outdoor activity, stress wearing personal protective equipment. Identify breeding sites through surveillance (light trapping, larval dips). Treat adults with aerial/ground ULV. Treat larvae chemically with larvicides. Reduce or eliminate breeding sites, (concentrate on artificial containers) mechanically. Contact NECE and local Health Department officials to obtain information about disease

threat.

3. Eastern Equine Encephalitis.

a. Reservoir: Potentially birds, rodents, bats, reptiles, amphibians and *Culex* spp. (Adults and eggs).

b. Mode of Transmission: Probably *Culiseta melanura* from bird to bird and one or more *Aedes* spp. and *Coquillettidia* spp. from birds or other animals to humans.

c. Control Measures: Restrict outdoor activity, stress personal protective measures. Identify breeding sites through surveillance (light trapping, larval dips). Treat adults with aerial/ground ULV. Treat larvae chemically with larvicides. Reduce or eliminate breeding sites mechanically. Contact local Health Department officials to obtain information about disease threat.

4. Malaria.

a. Primary Vectors: *Anopheles albimanus*

c. Vector Bioeconomics: Actual distribution and seasonality of *An. albimanus* is not known, but is expected to be found throughout the year. Larvae breed in fresh or brackish waters such as pools, blocked estuaries, puddles, marshes, ponds, and lagoons, especially those containing floating or grassy vegetation. Larvae prefer sunlight. Adult female mosquitoes feed on man and domestic animals, indoors and outdoors. After feeding, adults typically rest mainly indoors.

d. Control Measures: Restrict outdoor activity, stress wearing personal protective equipment. Identify breeding sites through surveillance (light trapping, larval dips). Treat adults with aerial/ground ULV. Treat larvae chemically with larvicides. Reduce or eliminate breeding sites mechanically. Contact local Health Department officials to obtain information about disease threat.

6. Rodent Associated Diseases.

a. Control Measures: Integrated pest management plan should include surveys, exclusion, trapping, sanitation, baiting and trapping.

7. Fly Associated Diseases.

a. Control Measures: Control measures should focus on rapidly restoring sanitation infrastructure to include solid waste storage and disposal; integrity of sewage systems; exclusion from foodservice areas, baiting and possibly aerosolized pesticides.

AUTHORIZED PESTICIDE USE LIST

(NCBC Gulfport)

PRI/DJI Pest Control

Pesticide	Common Name	Use
Disodium Octaborate Tetrahydrate	Gourmet Liquid Ant Bait	Ant Bait
Hydramethylnon	Amdro	Ant Bait
Fipronil	Top Choice	Ant/insect Bait
Methoprene	Precor	Flea Control
Imidacloprid	Max Force Fly Bait	Fly Bait
Glyphosate	Ranger Pro	Herbicide
Glyphosate	Rodeo	Herbicide
Bifenthrin	Talstar One	Insecticide
Boric Acid Powder	Perma Dust	Insecticide
Boric Acid Powder	Hot Shot	Insecticide
Cypermethrin	Demon Max	Insecticide
Hydroprene	Gentrol	Insecticide
Methylcarbamate	Invader HPX	Insecticide
Pyrethrin	565 plus XLO	Insecticide
Pyrethrin	Konk	Insecticide
Pyrethrin	Tri-Die	Insecticide
Pyrethrin	ULD-BP-300	Insecticide
Bromethalin	Talprid	Mole Bait
Methoprene	Precor	Mosquito Control
Methoprene	Altisid	Mosquito Control
Methoprene	Pre Strike	Mosquito Control
Permethrin	Evoluer 4-4 ULV	Mosquito control
Polycoxy	Agnique MMF	Mosquito Control
Hydamethylnon	Max Force	Roach Control
Bodificoum	Talon-G	Rodenticide Bait
Bromaldiolone	Maki	Rodenticide Bait
Zinc Phosphide	Gopha-rid	Rodenticide Bait
Chlorfenapyr	Phantom	Termiticide
Fipronil	Max Force FC	Termiticide
Allethrin	Wasp Freeze	Wasp Control

Enclosure (5)

EQUIPMENT AVAILABILITY LISTING

ITEM	QUANTITY
Toro Workman 200 200 gal spray rig 4-wheel drive	1
Rittenhouse 60 gal spray rig truck mounted	1
Fimco 25 gal spray rig truck mounted	1
Typhoon I mosquito fogger truck mounted	1
Typhoon II mosquito fogger truck mounted	1

Enclosure (6)

MOSQUITO SPECIES PRODUCING WNV POSITIVES

1. Aedes aegypti
2. Aedes albopictus
3. Aedes cinereus
4. Aedes vexans
5. Anopheles atropos
6. Anopheles barberi
7. Anopheles crucians/ bradleyi
8. Anopheles punctipennis
9. Anopheles walkeri
10. Anopheles quadrimaculatus
11. Coquillettidia perturbans
12. Culex erraticus
13. Culex nigripalpus
14. Culex pipiens
15. Culex quinquefasciatus
16. Culex restuans
17. Culex salinarius
18. Culex tarsalis
19. Culex territans
20. Culiseta inornata
21. Culiseta melanura
22. Deinocerites cancer
23. Ochlerotatus atlanticus/ tormentor
24. Ochlerotatus atropalpus
25. Ochlerotatus canadensis
26. Ochlerotatus cantator
27. Ochlerotatus japonicus
28. Ochlerotatus sollicitans
29. Ochlerotatus taeniorhynchus
30. Ochlerotatus triseriatus
31. Ochlerotatus trivittatus
32. Orthopodomyia signifera
33. Psorophora ciliata
34. Psorophora columbiae
35. Psorophora ferox
36. Uranotaenia sapphirina

Note: Keep in mind that evidence of WN virus in a mosquito species does not incriminate that species as a competent vector. It is only an indication that the species on the list have come into contact with the WNV transmission cycle. Vector incrimination requires additional information.
Data are provided to CDC by State Health Departments via Arbonet.

Enclosure (7)

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Glossary

Acaricide. An agent used to kill mites and ticks.

Applied Biology Program. A network of NAVFAC Pest Management Consultants (PMCs) in the Environmental Business Line that assist Navy and Marine Corps installations with FIFRA and Final Governing Standards-based compliance and provide Integrated Pest Management solutions that protect operations, war-fighters, quality of life, property, materiel and the environment from the adverse effects of living organisms.

Arachnid. An arthropod that has eight legs and two body segments in the adult stage.

Arthropod. Invertebrate animals (insects, arachnids and crustaceans) that have jointed appendages and a segmented body.

Avicide. An agent used to kill or repel birds.

Broad spectrum. A classification of pesticide that will kill a wide range of pests.

Broadcast application. The application of a pesticide to a wide area.

Crack and crevice treatment. Application of a pesticide to cracks and crevices where pests are known to live, feed, and/or breed.

DOD-certified pesticide applicator. Military or civilian personnel certified per the "DOD Plan for Certification of Pesticide Applicators" in the pest management categories that are appropriate for their type of work.

Drift. The movement of a pesticide through air, ground, or water out of the control target area.

Exclusion. A pest control method that prevents the entry of a pest into an area to be protected from the pest.

Functional area. Installation personnel, agencies, departments, contractors and facilities that use or store pesticides, conduct pest management operations, provide for safety or security of pest control operations, or have the responsibility of preventing pests.

Fungicide. An agent used to destroy or inhibit growth of fungi.

Herbicide. An agent used to destroy or inhibit plant growth.

Insecticide. An agent used to destroy insects.

Integrated pest management (IPM). A planned program incorporating education, continuous monitoring, record keeping, 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 habitat modification;

biological, genetic, cultural, mechanical, physical, and regulatory controls; and, when necessary, the judicious use of least-hazardous pesticides.

Integrated pest management coordinator. The individual officially designated by the installation commander to coordinate and oversee the installation pest management program and installation IPM plan. IPM coordinators must be certified as pesticide applicators if their job responsibilities require them to apply or supervise the use of pesticides.

Integrated Pest Management Plan. A detailed document for the design, implementation, and maintenance of all pest management and pesticide storage and use on an installation or group of installations.

Invasive species. A species of animal, plant or organism that is not native to a geographic area and can potentially cause harm to native organisms and their habitats.

Leach. The movement of a pesticide through soil.

Molluscicide. An agent used to kill snails.

Noxious or invasive weed. A weed that, if introduced, into a habitat can cause damage or injury to other organisms in that habitat. They may cause deprivation of water to other plants, physical injury to animals, or increased risk for wild fire.

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 Navy policy.

Pest. Any organism (except for microorganisms that cause human or animal diseases) that adversely affects operations, preparedness, the well-being of humans or animals, real property, materiel, equipment or vegetation, or is otherwise undesirable.

Pest management performance assessment representatives (PMPARs). Installation personnel trained in contract performance assessment and pest management, whose duties include surveillance of commercial pest management services to ensure that the performance complies with contract specifications and legal requirements. [Formerly known as Pest Control Quality Assurance Evaluators (PCQAE).]

Pest management. The prevention and control of disease vectors and pest that may adversely affect the DOD mission or military operations; the health and well-being of people; or structures, materiel, or property.

Pesticide. Any substance or mixture of substances registered by EPA under FIFRA, intended to destroy, repel, or mitigate pests. Includes, insecticides, rodenticides, herbicides, fungicides, plant regulators, defoliants, desiccants, disinfectants, antifouling paints and biocides (such as water treatment chemicals). NAVFAC PPMCs do not approve disinfectants or biocides.

Pesticide applicator. Any individual who applies pesticides.

Pesticide cancelation. An action by EPA that may limit the use of a pesticide. EPA often issues instructions with the pesticide cancelations providing information on the disposition of canceled pesticides.

Pesticide Facility. The building and areas designated for handling and storing pesticides.

Pre-treatment. A termiticide applied to the soil during the construction of a new building or addition.

Professional pest management consultant. Degreed technical specialists, such as NAVFAC civilian entomologists (Applied Biologist) and BUMED commissioned medical entomologists, who have command program oversight responsibilities and provides guidance and information on the management of pest management programs for commands and installations.

Registered pesticide. A pesticide registered by EPA for sale and use within the United States.

Residual pesticide. The application of a pesticide that will remain effective on to the surface to which it is applied for a long period of time.

Rodenticide. An agent used to destroy rodents.

Safety Data Sheet. A document (OSHA form 174, or equivalent) that accompanies a pesticide product, providing the handler with chemical information on ingredients, handling instructions, potential hazards, and manufacturer address and emergency contact information.

Space spray. The application of a pesticide as a fine airborne mist to kill flying insects. This includes ultra-low volume application and fogging.

Stakeholder. A person, agency, organization, or department that has an interest in the installation's pest management program.

State-certified commercial pesticide applicators. Personnel certified in accordance with FIFRA by a State (in which the work will be performed) with an EPA-approved certification plan and certified in the category in which a pesticide will be applied.

Subsistence. Stored food items.

Surveillance. The use of surveys over a period of time to monitor the increase and decrease of pest populations over time. Often used as a means of "early warning" of increase in pests or risk of disease and as a means of determining efficacy of pest management operations.

Survey. Observing, collecting, quantifying, identifying and analyzing a pest population.

Ultra-low volume (ULV). A method of applying a pesticide as a space spray. This method involves applying fine droplets of concentrated pesticide.

Uncertified pesticide applicators. Individuals who have not successfully completed certification training. Uncertified military and DOD civilian personnel who are in training to become certified pesticide applicators may apply pesticides when under the direct line-of-sight supervision of a DOD-certified pesticide applicator. Uncertified personnel may apply self-help or personal relief pesticides when the operation has been approved by a command pest management consultant.

Vector/Disease Vector. Any animal capable of transmitting the causative agent of 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 predominantly economic pests that as conditions change may require management or control as a disease vector.

Vector-borne disease. A disease transmitted by a vector.

Zoonosis. A disease that normally occurs in animals that can be transmitted to humans.

List of Acronyms and Abbreviations

AFPMB	Armed Forces Pest Management Board
AHB	Africanized Honey Bee
APHIS	Animal and Plant Health Inspection Service
AUL	authorized use list
Bti	*Bacillus thuringiensis israelensis*
BUMED	Navy Bureau of Medicine and Surgery
CAMA	calcium acid methanearsonate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	commanding officer
COR	contracting officer representative
CNIC	Commander, Navy Installations Command
CWP	contractor work plan
DOD	Department of Defense
DODI	Department of Defense instruction
DON	Department of the Navy
DSMA	disodium methanearsonate
EA	environmental assessment
EEE	Eastern Equine Encephalitis
EHS	extremely hazardous substance
EMS	Environmental Management System
EO	executive order
EPA	Environmental Protection Agency
ESA	Endangered Species Act

FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FSC/BOS	Facilities Support Contract/Base Operation Support
IAP	Internal Assessment Plan
IH	industrial hygiene
INRMP	Integrated Natural Resources Management Plan
IPM	integrated pest management
IPMC	integrated pest management coordinator
IPMP	Integrated Pest Management Plan
KO	contracting officer
MDAC	Mississippi Department of Agriculture and Commerce
MoM	measure of merit
MRE	meal, ready to eat
MSMA	monosodium methanearsonate
MWR	morale, welfare, and recreation
NAVMED	Navy Medical (Command)
NAFI	Non-Appropriated Fund Instrumentality
NCBC	Naval Construction Battalion Center
NECE	Navy Entomology Center of Excellence
NEPMU	Navy Environmental and Preventive Medicine Unit
NEX	Navy Exchange
NMCB	naval mobile construction battalion
NPDES	National Pollutant Discharge Elimination System
NOPRS	NAVFAC Online Pesticide Reporting System
OPNAVINST	Chief of Naval Operations instruction
OPNAV M	Chief of Naval Operations manual
ORM	operational risk management
OSHA	Occupational Safety and Health Administration

PAI	pounds of active ingredient
PAR	performance assessment representative
PMPAR	Pest Management Performance Assessment Representative
PMRS	Pest Management Record Spreadsheet
PMSP	Pest Management Service Provider
PMT	preventive medicine technician
POC	point of contact
PPE	personal protective equipment
PPMC	professional pest management consultant
PPV	public-private venture
PREVMED	Preventive Medicine Department
PWD	public works department
RTU	ready-to-use
SDS	safety data sheet
TG	technical guide
UFGS	Unified Facilities Guide Specifications
ULV	ultra-low volume
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDA-APHIS	United States Department of Agriculture-Animal and Plant Health Inspection Service
USFWS	U.S. Fish and Wildlife Service
USN	United States Navy
WMA	Western Maneuver Area
WNV	West Nile Virus

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