INTEGRATED PEST MANAGEMENT PLAN

2012

Naval Air Station Key West

Florida

PREPARED BY

Pest Management Plan
2012
Naval Air Station Key West
Key West, Florida

Plan Authorization

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3/16/12

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Pest Management Plan
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Naval Station Key West
Key West, Florida

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Pest Management Plan Annual Review

Year	Completion Date	Pest Management Coordinator	Copies of changes to the Pest Management Consultant (Annual) Date Completed

Scheduled On-Site Pest Management Technical Review

Scheduled Date	Pest Management Coordinator	Pest Management Consultant Date Review Completed

Note: DoD Pest Management Consultants review installation pest management programs on-site at least every 3 years. These on-site reviews will be conducted in conjunction with compliance evaluations and/or Navy Entomology Center of Excellence (NECE) shore station reviews whenever possible.

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Executive Summary

This Integrated Pest Management Plan (IPMP) provides a comprehensive, long-range document that captures all the pest management operations and pesticide-related activities conducted at Naval Air Station Key West. It incorporates pest management practices and the local, State, Federal and Department of Defense regulations conforming to the requirements of DoD Instruction 4150.7 and OPNAVINST 6250 while providing comprehensive information to Station staff and internal and external compliance auditors.
Naval Facilities Engineering Command (NAVFAC LANT & NAVFAC SE) Applied Biology Branch prepared this plan, from data collected through pest management data collection, on-site observations, and interviews with Station personnel, and document reviews. Additional information was obtained from the Navy Entomology Center of Excellence (NECE) NAS Jacksonville, FL.

The mission of Naval Air Station Key West "supports operational and readiness requirements for Department of Defense, Department of Homeland Security, National Guard units, federal agencies, and allied forces."
The main goal of the various pest control functions is to support this mission. In addition, Morale, Welfare and Recreation, provides a valuable recreational source to the Station. Pest control services are needed at the Naval Station to:

(1) Provide services that will prolong the life of the structures through subterranean termite, drywood termite, and nuisance pest control

(2) Maintain the safety and security of air operations facilities, industrial and storage areas through weed control;

(3) Provide nuisance pest control to all buildings and housing areas to insure 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 insure the comfort and well-being of all personnel; and

(6) Provide vertebrate pest control, including rodent control, to all areas of the Station.

(7) Provide control of invasive, exotic vegetation and other nuisance plants and animals within Threatened and Endangered species habitat and other natural areas.

Contract personnel must meet state certification requirements specified by contract. Quality Assurance Evaluator (QAE) must successfully take an initial Pest Control QAE Course must successfully pass a DOD pest control training and recertification course every three years to maintain their certification.
The focus of this Plan is on safe, environmentally sound, and cost-effective control of pests through Integrated Pest Management (IPM). IPM depends on education, proper surveying and identification of pests; non-chemical and chemical control methods, and individual responsibility for pest prevention.

1 Introduction[1]

1.1 The Pest Management Plan

1.1.1 Scope

The Naval Air Station (NAS) Key West 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 DoD personnel and commercial contractors within all functional areas of NAS Key West. A glossary of abbreviations used in this document is found in Appendix B.

1.1.2 Authority

OPNAVINST 6250.4b[14] and OPNAVINST 5090.1C[15] require all Navy activities that apply pesticides to have an IPMP. OPNAVINST 6250.4b[16] incorporates DoD Instruction 4150.7[17], DoD Pest Management Program, as an enclosure. Thus, all references to the OPNAV Instruction refer to the DoD Instruction as well. OPNAVINST 6250.4B and a list of other regulations and guidance associated with Navy installation pest management programs are included in Appendix L [18]. The Plan is fully implemented upon the review and signature of the Installation Commanding Officer (ICO).

1.1.3 Purpose and Structure

The IPMP provides a comprehensive overview of pest management and pesticide related operations on NAS Key West and serves as a reference by all installation personnel. The Plan structure is as follows:

- **Section 1** addresses the purpose of the Plan and its maintenance and implementation. It also provides background on the installation and an overview of the current pest management program and requirements.
- **Section 2** describes the organization and responsibilities of the functional area of the program and the administrative requirements and documentation.
- **Section 3** describes the field operation of pest management including integrated pest management (IPM), pesticide management, contracting, and current practices.
- **Section 4** provides lists and descriptions of hazards and hazard abatement practices associated with pest management.
- **Section 5** addresses the environmental considerations of the program including regulatory compliance, the application of environmental management systems to pest management.
- **Section 6** describes emergencies that are the result of infestations.
- **Section 7** provides a list of resources available to the installation.
- **Appendices** provide references and supporting documents.

1.1.4 Plan Implementation

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

[1] **NOTE:** Throughout this document, references are indicated with endnotes. These endnotes are used to direct the reader to the IPMP CD-Rom appendices section or to a website where the file is located. Due to computer restrictions, hyperlinks to these files may not work and the reader must manually select the referenced file.

1.1.5 Plan Maintenance

The IPMP must be reviewed annually and updated, if necessary once developed and implemented per (OPNAVINST 6250.4b) [19]. The installation Pest Management Coordinator (IPMC) is responsible for maintaining the Plan.

1.1.5.1 Internal Review

An internal review is conducted annually by the IPMC in coordination with the pest management service providers (PMSP) and other functional area points of contact (POC). The review should include updating contract information, applicator certifications, pesticides and pest management operations to be used on the installation, and updating pesticide use records. The installation Internal Assessment Plan (IAP) for the pesticide program should be used to review compliance issues. The form in **Appendix (D)** should be completed and provided to the NAVFAC LANT APPLIED BIOLOGY professional pest management consultants (PPMC) for signature.

1.1.5.2 Off-site Review

The IPMC may request a review by the NAVFAC LANT APPLIED BIOLOGY PPMC for review of regulatory requirements, reporting and pesticide approval procedures.

1.1.5.3 On-site Review

The NAVFAC LANT APPLIED BIOLOGY PPMC shall perform an on-site review of the entire pest management program every 18 to 36 months to ensure compliance with the Plan. The review may be performed more frequently if extensive program problems exist or as requested by the activity.

1.1.5.4 Plan Rewrite

The Plan should be rewritten every 5 years to reflect new contracts, personnel, pest management practices, and regulatory changes.

1.2 Installation Background

1.2.1 Location and Facilities

The Naval Air Station Key West complex occupies 6,461 acres of land distributed over fourteen (14) properties in the Florida Keys. Fourteen of the properties are located in the Lower Florida Keys within a seven-mile radius from the primary Boca Chica Field, on Boca Chica Key approximately 6.8 miles northeast of downtown Key West. Boca Chica Field encompasses 3,912 acres and consists of an airfield, administrative and industrial facilities, and recreational areas. The only property located outside the Lower Keys is a 68-acre, primarily undeveloped site in Key Largo. The Air Station is located in the city of Key West and in the unincorporated portion of Monroe County, Florida. It is located approximately 156 highway miles southwest of Miami and 90 miles north of Cuba. The complex provides space and services for 32 tenant commands including USAF, US Army, Coast Guard, and the Joint Interagency Task Force (JIATF) South.

1.2.2 Facilities' Descriptions and Missions

1.2.2.1 Naval Air Station Key West, Key West, Florida

The primary mission of the Naval Air Station is "To serve as the Navy's premier pilot training facility for transient tactical aviation squadrons, to maintain and operate facilities, and to provide services and materials in support of this nation's military aviation activities as directed by the Chief of Naval Operations."

A secondary mission is to support Tenant and Supported Unit Commands.

1.3 Pest Management Program Overview

1.3.1 Overview

Pest control services are provided through a contracted pest control service. A contractor provides right-of-way weed control, pest control in industrial areas and housing; and mosquito abatement. A Pest Management Service provider (PMSP) conducts all outdoor turf and ornamental pest management. The NAS Key West Public Works Department Environmental Division conducts surveys and directs invasive, exotic plant control, and provides quality assurance and contract oversight for the PMSP management programs. Wood preservation, prevents wood destroying pests and is an important pest management operation.

1.3.2 Pest Management Objectives

The objectives of the NAS Key West pest management program are:

1. **The prevention of pest-related health and safety problems that affect the mission.** Prevention of pest-borne disease and injury is a component of Force Health Protection (FHP). FHP 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, aircraft squadrons, and other deployable units. Additionally, the military and civilian infrastructure on the Station must be protected in order to provide the necessary support to these units as well. Readiness also means ensuring that all installation personnel, including dependents, are provided with healthy work and living conditions that will contribute to a high quality of life.
2. **The prevention of pest damage to equipment and subsistence used to support the operational mission of the activities and tenant commands.** Millions of dollars of high tech equipment and materiels are maintained and stored on NAS Key West. This materiel is susceptible to physical damage by pests. Rodents, for example, can cause considerable damage to electronic equipment through gnawing on electrical components.
3. **Vegetation management to protect the local environment.** The introduction of non-native species of plants can increase the risk of fire and degrade the surrounding native environment that is home to a number of rare, endangered and threatened animal and plant species. The federal, state and local governments work cooperatively to control invasive plant and animal species.
4. **The protection of government real property, materiel and aesthetics.** Buildings and roads that form the infrastructure of the Station are susceptible to pest damage. Termites can cause extensive damage to wooden structures if not adequately prevented and controlled. Weeds can cause damage to roadways and increase the risk of fire. Rodents and insects may infest equipment and materiel, chewing through wiring, shorting electrical switches, panels, damaging food stores, and transmitting diseases.
5. **Reduce the use and dependence on pesticides.** The reduction of pesticides requires an Integrated Pest Management Program (IPM). This IPM program relies on intense inspections, pest identification, and the selection of a variety of control methods that is best for the situation.

1.3.3 Program Requirements

1.3.3.1 Administration

Table 1-1 outlines the pest management administrative program requirements.

1.3.3.2 Operations

Pest management on NAS Key West includes the following categories of operations:
Ornamental and turf - Control and management of pests of landscape plants and turf, including arthropods, fungi, and weeds.
Right-of-way - Control and management of vegetation along roadways. It also includes vegetation control near fuel farms to reduce fire risk and along fence lines to enhance security.
Aquatic Weed Control – Control of vegetation in ponds and ditches.

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.
Mosquito Abatement - Control and management of mosquito and disease vector pests.
Invasive plant species - Removal of invasive, non-native species of plants that are detrimental to rare, threatened and endangered species, native plants and animals and their habitats.
Vertebrate Control – Control of animal predators that prey upon rare, endangered or threatened animals and their habitats, infest food and material storage.
Wood preservation – Treated wood used for utility poles, railroad ties, and pier pilings and fenders.

Table 1-1. Pest Management Administration Program Requirements

Requirement	Description	Reference	Responsibility
PLANNING	Review and revise the Pest Management Plan annually.	OPNAVINST 6250.4b[20] OPNAVINST 5090.1[21]	IPMC
RECORDING	Record all pest management operations conducted on the Station after each operation.	OPNAVINST 6250.4b[22] OPNAVINST 5090.1[23]	All pesticide applicators
MAINTAINING	Maintain records of all pest management operations conducted on Station on-site indefinitely	OPNAVINST 6250.4b[24] OPNAVINST 5090.1	IPMC in coordination with Contracted pesticide applicators and PMPARs.
REPORTING	Compile and report all pest management operations to the NAVFAC LANT APPLIED BIOLOGY monthly.	OPNAVINST 6250.4b[25] OPNAVINST 5090.1[26]	IPMC in coordination with Contracted pesticide applicators and PMPARs.
PESTICIDE APPLICATOR QUALIFICATION	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 6250.4b[27] OPNAVINST 5090.1[28]	IPMC in coordination with Contracted pesticide applicators and PMPARs.
COMPLIANCE	Ensure that all program elements are in compliance with all Federal regulations. The Station is also encouraged to comply with County and State regulations.	OPNAVINST 6250.4b[29] OPNAVINST 5090.1[30] FIFRA[31]	IPMC in coordination with Contracted pesticide applicators and PMPARs.
PESTICIDE APPROVAL	**Compile and submit list of new pesticides to the NAVFAC LANT APPLIED BIOLOGY for approval for use on the Station.**	OPNAVINST 6250.4b[32] OPNAVINST 5090.1[33]	IPMC in coordination with Contracted pesticide applicators and PMPARs.

Requirement	Description	Reference	Responsibility
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."	USC Title 7, Chapter 6, Subchapter II, Sec. 136r-1[34]	IPMC in coordination with Contracted pesticide applicators and PMPARs.
STORAGE	Pesticides kept on installations must be procured and stored in accordance with installation, and Federal regulations. The Station is also encouraged to comply with County and State regulations.	OPNAVINST 6250.4b[35] TG 07 Pesticide Security [36]	No storage facilities on activity.
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 person responsible for the container, name of chemical and signal word.	Appendices\Appendix L Laws, Regs & Publications\Florida Statutes and Codes\CHAPTER 5E-14 FAC .PDF[37]	Contractor Pesticide applicators
VEHICLES	Must carry pesticide spill kits and properly secure pesticides and pesticide application equipment when not in use.	OPNAVINST 6250.4b[38] 5E-14.103 Licensee Identification - Vehicles, Equipment[39]	Contractor Pesticide applicators / vehicle operators
APPLICATION	Only registered pesticides will be used. Applications of pesticides must be performed to ensure safety and protection of the environment. A copy of the pesticide label shall be available at the application site.		Contractor Pesticide applicators

Requirement	Description	Reference	Responsibility
CONTRACT REVIEW	Review pest management contract specifications for compliance with the Pest Management Plan and submit to the NAVFAC LANT APPLIED BIOLOGY for final review and approval prior to advertising.	OPNAVINST 6250.4b[40] OPNAVINST 5090.1.[41]	IPMC in coordination with Contracted pesticide provider and PMPARs and the contracting officer (KO).
APPLICATOR SAFETY	Procedures, medical support, equipment and supplies to ensure the safety of pesticide applicators during pest control operations must be provided by the installation.	OPNAVINST 6250.4b[42]	Naval Ambulatory Care Clinic, Safety Department, PMSP QC
OCCUPATIONAL HAZARDS MONITORING	Workplace monitoring may be conducted by the medical department to ensure a safe and healthful environment for activity personnel during pest management operations.	OPNAVINST 6250.4b[43] OPNAVINST 5100.23D[44]	Naval Ambulatory Care Clinic
CLEANING AND DISPOSAL	Equipment shall be cleaned to prevent health and environmental hazards due. Rinseates from container and equipment rinsing should be prevented from entering storm drains and water bodies. Dispose of empty containers properly. Shall be preformed Off activity for contracted PMSP.	OPNAVINST 6250.4b[45] 40 CFR 165; [46]	Contractor Pesticide applicators
SPILL PREVENTION	Spill kits shall be maintained in pest control shops and on contractor pest control vehicles. Contract Pest management personnel should be familiar with the installations spill contingency plan.	OPNAVINST 6250.4b[47]; OPNAVINST 5090.1[48]; **NAS Key West Spill Prevention and Control Instruction**	Contractor Pesticide applicators

2 PROGRAM ADMINISTRATION

2.1 Functional Areas, Roles and Responsibilities

The pest management program is comprised of functional areas that are involved with pest and/or pesticide management. Functional areas perform the following in the program: 1) administer pest management operations, 2) store and/or display pesticides, 3) mix and apply pesticides, 4) conduct non-chemical pest management practices, 5) monitor or inspect pest prevention or control operations, 6) dispose of pesticides, 7) conduct pest surveillance, and 8) maintain application equipment. The success of the pest management program depends largely on a clear understanding by the personnel of the functional areas of their roles and responsibilities.

2.1.1 Installation Commanding Officer

Issue an appointment letter to designate a Pest Management Coordinator (IPMC) in writing;
Approve, sign and support the implementation IPMP;
Ensure appropriate funding of pest management programs to provide for effective and safe control of pests based on pest management objectives for NAS Key West;
Ensure that installation personnel administering or performing pest control receive adequate training, and maintain pest management certification as required;
Ensure that all pest management operations are conducted safely and have minimal impact on the environment.

2.1.2 Installation Pest Management Coordinator (IPMC)

The Installation Pest Management Coordinator (IPMC) is a collateral duty of the Natural Resources Manager in the Public Works Department Environmental Division. The IPMC will coordinate the NAS Key West pest management program including implementation, maintenance, review and annual update of the installation IPMP;

- Coordinate revision of the IPMP every 5 years;
- Promote integrated pest management (IPM) in the pest management program to cost-effectively and safely manage pests and to prevent adverse environmental impact;
- Receive and consolidate pest management records from all contracted pesticide applicators and submit monthly to NAVFAC LANT APPLIED BIOLOGY; this may be delegated to the Facilities Support division PAR.
- Ensure current certification and continuing pest management training of the contracted pesticide applicators and pest management performance assessment representative (PMPARs);
- Receive and compile list of new pesticides and uses and equipment from all pest management service providers (PMSP) on the Station and submit to NAVFAC LANT APPLIED BIOLOGY for review and approval;
- Maintain current list of approved pesticides;
- Act as liaison between the Station and NAVFAC LANT APPLIED BIOLOGY and local, State of Florida, and Federal agencies for pest management and pesticide regulatory issues;
- Ensure that the Station Contracting Officer submits pest management contract specifications to the NAVFAC LANT APPLIED BIOLOGY PIPMC for review prior to advertising; and
- Act as the Commanding Officer's advisor for pest management issues.

2.1.3 Facilities Management Facilities Service

Personnel in this Division monitor the performance of the contracted PMSPs. The responsibilities of this Division are to:

- Provide the PMPAR to monitor and evaluate the performance of the contract-provided service to ensure that pest control measures are being properly applied;

- Coordinate pest management contract specifications prior to bidding with the IPMC for review prior to submittal to the NAVFAC LANT APPLIED BIOLOGY pest management consultant for review and final approval;
- Maintain copy of each contract on file;
- Monitor commercial pest management contractors ensuring effective and safe pest management practices, identify and document discrepancies, and seek corrective action with contractor in accordance with the contract;
- Document and maintain accurate records of all contractors' pesticide applications and report actual pesticide use to the IPMC and NAVFAC LANT as directed.;
- Note pest situations and seek advice for corrective actions; and
- Maintain liaison with the IPMC.

2.1.3 Naval Ambulatory Care Clinic Occupational and Preventive Medicine Department

Personnel in preventive medicine have the overall responsibility for ensuring prevention of vector-borne diseases and other health threats due to animals on the installation. Environmental health support is provided by the medical clinic. Responsibilities include:

- Act as medical department liaison to the Installation Commanding Officer for public health pest management;
- Conduct food service sanitation and habitability inspections at Station facilities;
- Provide support for pest management operations involving medically-important pests;
- Conduct surveys and surveillance for pests of medical importance, such as cockroaches, mosquitoes, bedbugs, etc;
- Preventive Medicine Technicians (PMT; NEC 8432) shall maintain current DoD pesticide applicator certification in Category 8: public health pest management;
- Establish and maintain liaison with local health agencies as they pertain to pest management;
- Provide occupational health and safety support for pesticide applicators;
- Maintain a record of pest management operations including food handling area surveys, mosquito trap surveys, mosquito control applications performed and other disease vector surveys preformed. This data should be provided the IPMC to provide station wide IPM coordination and data management;
- Develop, maintain and implement an emergency plan for vector-borne disease control during a vector-borne disease outbreak or disaster.

2.1.4 U.S. Army Veterinary Services

The primary mission of the Army Veterinary Techs is to:

- Ensure protection of food from pests at the Commissary;
- Report pest infestations that require professional pest management services;
- Conduct surveillance for pests that damage, destroy and contaminate food stored in the Commissary and installation facilities.

2.1.5 Public Works Department Environmental Division

The Public Works Department Environmental Division provides oversight on environmental protection and compliance regarding pest management operations. They also conduct programs that involve pest management practices. One natural resources manager oversees projects involved in the removal, and control of invasive, exotic vegetation and nuisance animals. These projects are completed with the use of contractors and inhouse forces (i.e., shops).

The IPMC is a Department staff member. Responsibilities include:

- Provide technical assistance on matters relating to endangered and threatened animal and plant species;
- Conduct projects involved in the removal, treatment and control of invasive, exotic vegetation and nuisance animals;

- Installation environmental review and approval of pesticides and pest management operations that may adversely impact the environment; and
- Provide environmental review and approval of the IPMP.

2.1.6 Navy Exchange (NEX)

If the NEX sells pesticides to private consumers. Responsibilities include:
Ensure that pesticides for retail sale are safely displayed on shelves and properly stored;
Properly dispose of pesticides and containers if the product has exceeded its shelf life or the EPA registration has been cancelled; and
Ensure that store employees are properly trained on the emergency procedures in the event of a pesticide spill.

2.1.7 Commissary

Veterinary technicians are assigned to the Commissary for quality assurance and food inspection of the Commissary and all messing facility and retail sale foods on Station. Responsibilities include:
Ensure that pesticides for retail sale are safely displayed on shelves and properly stored;
Ensure delivered food products are free from pest infestation;
Ensure proper sanitation and hygiene to prevent pest problems; and
Ensure control of pests that occur in the Commissary.

2.1.8 Morale, Welfare and Recreation

MWR provides recreational activities for military and civilian personnel on NAS Key West. Responsibilities include:
Ensure that all pest management conducted at MWR facilities are recorded and reported to the IPMC and to NAVFAC LANT APPLIED BIOLOGY; and
Submit any contract specifications for pest management to the IPMC and to NAVFAC LANT APPLIED BIOLOGY PIPMCs for technical review prior to submitting the contract for bid.

2.1.9 Contract Pest Management Service Providers

Contract PMSPs provide all of the services on NAS Key West. See section 2.4 for more information on contracting.
Conduct pest management operations in accordance with the contract specifications;
Comply with all DoD, federal, state and local pest management regulations; and
Cooperate fully with and communicate all pest management issues and requirements via the contract PMPAR.

2.1.10 Housing Manager

Ensure housing occupants maintain sanitation and pest exclusion in Navy housing; and
Ensure housing occupants take appropriate control measures of minor infestations before requesting professional pest management services; and
Ensure repairs are made to buildings that will prevent and exclude pests as recommended my pest management professionals.
If PPV then follow contract instructions. Maintain the appropriate records required by Federal, State, and installation laws, regulations, and instructions.

2.1.11 All Installation Personnel and Housing Residents

Apply appropriate sanitary and pest exclusionary practices to prevent pest infestations; and
Attempt to control minor pest infestations through mechanical or other means before requesting a PMSP; and
Coordinate and cooperate fully with PMSPs in scheduling pest management and preparing the areas for pesticide treatment.

2.1.12 Pesticide Approval

Only pesticides approved by both the EPA and the state of Florida shall be used. Additionally, DoD and DoN directives require installations to submit a list of all pesticides that will be used during control operations to the cognizant pest management consultant for review and approval (OPNAVINST 6250.4b[49]). The purpose of this approval process is to ensure that only registered pesticides that are appropriate and most effective will be properly used on the installation. The IPMC will compile a list of pesticides anticipated for use by all PMSPs on the Planned Pesticide Use Sheet (PPU). Copies of the PPU may be provided to the PMSPs to enter the pesticide information. The IPMC shall submit the list via fax or e-mail to the Environmental Division for review. The list will then be submitted to NAVFAC LANT APPLIED BIOLOGY. New pesticides may also be added to the list and submitted for approval as needed. Pesticides currently approved for use on the installation are listed in Appendix E.

2.1.13 Pesticide Labels and Material Safety Data Sheets

A copy of the manufacturer's label and a Material Safety Data Sheets (MSDS) for each pesticide on the approved pesticide list shall be maintained by the IPMC. The IPMC may choose to store those copies with the PMPARs and/or the PMSPs. Electronic versions of the labels may also be maintained.

2.2 Records and Reporting

Pest management records (both pesticide applications and non-chemical operations) shall be submitted to the NAVFAC PIPMC at least monthly. The IIPMC or his/her designated personnel will compile and maintain the records in an electronic database. The records will include the following data: kinds, amounts, uses, dates, places of application, and applicators names and certification. Pest surveys and inspections should also be included. Records shall be maintained separately from other files, including contracts files. Records shall be maintained electronically and submitted to the NAVFAC Atlantic PIPMC electronically. There are two options. The preferred option is to report all pest management operations through the NAVFAC on-line website portal https://clients.emainc.com/dcs/ pestmanagement/pesticidelogon.asp. In order to obtain a password and instructions for using this site, the IIPMC should contact Mr. Steve Robertson at steve.b.robertson@navy.mil or 757-322-4752. Alternatively, pest management records may be recorded using the NAVFAC-approved spreadsheet. The records are recorded in the spreadsheet and the spreadsheet is e-mailed monthly to the NAVFAC PIPMC. A copy of the spreadsheet can be obtained by contacting the NAVFAC PIPMC.

The following pest management operations are excluded from the recordkeeping/reporting requirement, per **reference (a)**:

1. Personal use of insect repellent.
2. Application of repellent by deployable units during mass treatment of clothing and tent material.
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.

Reports will be reviewed by the NAVFAC Atlantic PIPMC to provide program oversight to the installation and to generate data for tracking overall Navy pesticide usage. Additionally, records are used to report pounds of active ingredient used for the DoD Measures of Merit (MoMs), per **reference (a)**.

2.3 Training, Certification and Licensing

IPM 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. Copies of certifications and licenses of the pesticide applicators and PMSP currently conducting pest control operations on NAS Key West are maintained in Appendix K[50].

2.3.1 Requirements for DoD applicators

This paragraph is for information purposes only.
"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 of Restricted Use Pesticides or an EPA-approved State certification plan" (OPNAVINST 6250.4(b) [51], Encl (1), pg 4-5). Additionally, professional pest management personnel shall be certified if their duties include (OPNAVINST 6250.4(b) [52], Encl (1), pg.4-6): Making recommendations for the use of pesticides, applying pesticides, or directly supervising the application of pesticides.
Conducting demonstrations on the proper use and techniques of pesticide application or the supervision of pesticides.
Conducting field research that includes using or supervising the use of pesticides.

DoD applicators are usually certified in the following categories (DoD 4150.7P[53]):
Cat. 3. Ornamental and Turf
Cat. 5. Aquatic
Cat. 6. Right-of-Way
Cat. 7. Industrial, Institutional, Structural, and Health-Related
Cat. 8. Public Health
Some may also hold a certification in:
Cat. 2. Forestry and
Cat. 11. Aerial Application.

Initial certification is a four-week course conducted by a designated DoD training agency. Currently, the Navy course is conducted at the Navy Entomology Center of Excellence at NAS Jacksonville, Florida
CIN B 322 1070 – Pesticide Applicator Training (Basic)
CIN B 322 1071 – Plant Pest and Vegetation Management
CIN 322 1072 – Arthropod and Vertebrate Pest Management
Initial and recertification in Category 11 is a one-week course conducted by the Air Force Reserve in Vienna, Ohio. Certification for all categories is valid for 3 years. Recertification courses in all categories except Category 11 are conducted annually by NAVFAC LANT APPLIED BIOLOGY in the Norfolk, VA and Jacksonville, FL areas. Contact the NAVFAC LANT APPLIED BIOLOGY pest management consultant for dates and schedules of upcoming courses. Specific requirements for DoD certification are found in DoD Plan 4150.7-M: DoD Pest Management Training and Certification Manual[54],. Copies of the current DoD pesticide applicators' certifications are maintained in Appendix K. Courses may be found in the AFPMB website under DOD Pest Management Certification and Training.

2.3.2 Requirements for commercial contractor applicators

"Contractor employees performing pest management on the installation shall be certified prior to the beginning of the contract under the State of Florida plan[55]. The contractor shall provide evidence of training and experience in the specific pest control category(s) for services that they provide" (OPNAVINST 6250.4b, Encl. (1), pg.4-5) [56].

2.3.2.1 Grounds maintenance

To apply pesticides for grounds maintenance or right of way weed control on the installation the contractor pesticide applicator must hold a "Qualified Applicator License" issued by the Florida Department of Agriculture and Consumer Services (DACS) State of Florida plan[57].

For more information on pesticide applicator licensing in Florida go to the Florida DACS website Pesticide Applicator Licenses, Licensing Permits Registrations - FDACS[58]
http://www.doacs.state.fl.us/onestop/aes/pestapp.html
Copies of commercial pesticide applicators should be placed in appendix K[59].

2.3.2.2 Structural Pest Control

Applicators applying pesticides inside and outside buildings to control household or structural pests must have a license in structural pest control. Persons conducting fumigations must be licensed in fumigation.

2.3.2.3 Mosquito Control

Applicators conducting mosquito control must have a "Qualified Applicator License" in public health pest control.

2.3.3 Pest Management Performance Assesment Representative

PMPARs or others, who inspect the performance of contractor provided pest management services, must be trained in pest management (OPNAVINST 6250.4b[60]), Encl. (1), pg.4-8). NAVFAC LANT APPLIED BIOLOGY[61] provides a four-day initial PMPAR training course annually. The PMPAR should attend refresher training every three years. This is also conducted by NAVFAC LANT APPLIED BIOLOGY annually. Contact NAVFAC LANT APPLIED BIOLOGY for training schedules. A copy of the PMPAR's training certificate should be placed in appendix K[62].

2.3.4 Installation Pest Management Coordinators

Frequently personnel with no previous experience in pest management will be assigned as the installation IPMC or environmental division pesticide program manager and are given administrative and/or environmental oversight of the pesticide program. These personnel shall attend a DoD pest management course to familiarize themselves with the administrative and operational requirements of installation pest management. The four-week initial certification course is recommended but the four-day initial PMPAR training course provides sufficient familiarization. DoD certification may be required if the IPMC is required to select or apply pesticides. A copy of the IPMC's appointment letter issued by the Commanding Officer is in Appendix K[63].

2.4 Pest Management Contracting

2.4.1 Contract Specifications and Review

To ensure cost-effective pest control, contract specifications must be carefully written. The trained PMPAR should provide guidance to the specification writer to ensure contract requirements are described in a manner that enables the Government to objectively assess the contractors' performance. The basis of the contractors' performance is measured by the cessation of damage or reductions in the number of pests counted after the contractor has performed the work. NAVFAC LANT APPLIED BIOLOGYis required to review the specifications prior to advertising the contract for bidding (OPNAVINST 6250.4B, Encl 1, p. 4-8[64]). Guidance on writing contracts can be found in AFPMB TG 39: Guidelines for Preparing DoD Pest Control Contracts using Integrated Pest Management[65] or at the AFPMB website (http://www.afpmb.org/pubs/tims/tims.htm). The NAVFAC guide performance work statements can be found at in the NAVFAC portal Organization> **Public Works> FSC Mgmt and Facility Services >Templates.** A copy of the current specifications for the pest management contracts are in Appendix G.

2.4.2 Contract Quality Assurance

All aspects of pest management contracts must be monitored by a trained PCQAE to assure compliance with OPNAV and contract specs.

Table 2-1: Current Pest Management Contracts

Program and Contract	Provider and Contract Date	Contract Administrator	QAEs
Pest Control	Eco Lab	Jean Norris	
Mosquito Control	Florida Keys Mosquito Control District Contract #N62467-06-R-2790	Jean Norris	
Structural Termite Control			
Structural Fumigation			
Grounds Maintenance			
Invasive Weeds Management			
Agricultural Out-leases			
Job Orders			

3 Operations

3.1 Integrated Pest Management (IPM)

3.1.1 Federal Regulation and Policy

US Code 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." (7 USC Title 7, Chapter 6, Subchapter II, Sec. 136r-1)[66] It is DoD policy 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 pest management plans and other written guidance to reduce pesticide risk and prevent pollution." OPNAVINST 6250.4b[67] The following website will link to entire current Federal Insecticide Fungicide Rodenticide Act (FIFRA) Law:
http://www4.law.cornell.edu/uscode/html/uscode07/usc_sup_01_7.html

3.1.2 What is IPM?

IPM is "a planned program, incorporating continuous monitoring, education, 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 education, habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and where necessary, the judicious use of least-hazardous pesticides." {OPNAVINST 6250.4b[68]] There are significant differences between IPM and "traditional" pest control methods. Table 3-1 lists some of the differences.

Table 3-1. Comparison of Traditional Pest Control and IPM Methods

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

In IPM programs, treatments are not made according to a predetermined schedule. Rather, they 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.

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

- **Identify** pests and possible natural enemies;
- **Develop plans/strategies**, 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;
- **Establish action thresholds**, or that size of the pest population correlated with a threshold, sufficient to warrant treatment. In determining threshold levels, the amount of aesthetic or economic damage 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;
- **Monitor pest population** for regular sampling of pest and natural enemy populations. Monitoring is an ongoing activity;
- **Control pest** (optional as to IPM methods used);
- **Document results**; and
- **Evaluate/redesign plan** to determine the outcome of treatment actions.

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

3.2 Current Pest Management Operations

3.2.1 General Household and Nuisance Pests[69]

Pest control, for the purposes of this Plan, is the control of arthropod and vertebrate pests in and around buildings. Sanitation, glue traps and exclusion are the primary means of non-chemical control in and around structures. Low toxicity insecticidal baits are used effectively for cockroaches and ants. Most pesticide applications involve the application of contact chemicals or those that have short residual efficacy.

3.2.1.1 Cockroaches[70]

The general adaptability of the German cockroach makes it the single most important pest problem in activity food service areas. An integrated approach[71] of using both preventive and corrective techniques is the only practical means of controlling this pest.

3.2.1.2 Preventive Control Measures

Preventive control measures including inspection, interior and exterior facility sanitation and exclusion methods, such as closing harborage areas by caulking or other modifications, reduce the chances for pest survival by limiting needed food, water, and shelter. In buildings that are most susceptible to pest infestation, services are performed on a scheduled basis. Service includes inspection, recommendations on pest proofing and sanitation and chemical control, if needed. Common use areas and food consumption areas of other buildings, i.e., areas used by people as a group, such as heads, coffee messes, lounge areas, and vending machine rooms, are serviced on a monthly basis with response to call-backs as necessary. This also includes common use areas of the barracks, the Supply Warehouse, 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.

3.2.2 Grounds Maintenance[72]

Grounds maintenance is performed on improved or landscaped grounds. Pest management during grounds maintenance may involve weed control, control of pests and diseases on plants, trees and turf, and control of vertebrate animals 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, airfield runways, fencelines, and at fuel farms where they pose fire and visibility concerns.

3.2.2.1 Turf and Ornamental Pests

Turf and ornamental pests include insect, fungi and nematodes. White grubs[73], mole crickets[74] and ants infest the soil and roots of the plant. Japanese beetles[75], bagworms, tent caterpillars, sod webworms, and army worms feed on the leaves of the plant. Chinch bugs[76], leafhoppers, scale insects[77], and aphids[78] are referred to as plant sucking insects and feed on the fluids inside the plant. Oak borers and bark beetles are boring insects[79] and damage the plant by destroying the ability of the plant to transport nutrition and water. Various plant diseases[80] including brown patch, dollar spot, and fusiform rust are also possible pests that may be encountered.

3.2.2.1.1 Mole Cricket Control[81]

Mole Crickets[82] are a problem in turf areas. Because it feeds on the roots of the grass, the nymphal stage is very destructive. Mole crickets are best controlled by using insecticidal baits and residual insecticides on the nymphal (feeding) stage. Control of the adult stage is done only when damage levels present are excessive. Proper timing, weather conditions and the stage of the insect are important considerations in obtaining effective treatment. An area-wide treatment of all continuous lawn areas is much more effective than scattered spot treatments. This treatment should be performed once a year when mole crickets are in the nymphal stage and repeated again if the population builds back up.

3.2.2.1.2 Nematodes[83]

Nematodes are often responsible for large amounts of turf damage. It is a NAVFAC LANT APPLIED BIOLOGY policy that the presence of nematodes must be verified by a soil test before a nematicide can be used. The soil samples should be taken and the results forwarded to NAVFAC LANT APPLIED BIOLOGY before approval can be given for the purchase of nematicides. Consider using soil amendments that select for microorganisms that may prey on nematodes. **Current pesticides labeled for nematode control are extremely toxic and care must be taken in their selection and application.**

3.2.2.1.3 Other Turf Pests and Diseases[84]

Turf insects such as armyworms, sod webworms, mole crickets and chinch bugs are occasionally a problem. Turf diseases such as pythium, fusarium blight, brown patch, dollar spot and helminthosporium are potential problems as well. Daily inspections during periods when pest problems are likely to occur should detect problems before significant damage is done. Natural controls are maximized when chemical control operations are based on need instead of schedule. This careful use of chemical control can help avoid environmental and pest resistance caused by overuse of pesticides. The only exemption to need based control are the preventive treatments for pythium and dollar spot.

3.2.2.2 Weed Control[85]

A wide variety of herbicides are available for controlling unwanted vegetation. Herbicides are 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 Logistics Station. 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 must be used. Guidance on the use of available control techniques may be obtained from the Long Term Land Management Plan provided by NAVFAC LANT APPLIED BIOLOGY. Discussion of any specific invasive weed control problems and recommendations for solutions should be obtained from the Natural Resources Staff, NAVFAC SE.

3.2.3 Aquatic Weed Control

NAS Key West aquatic weed control[86] work should be maintained in accordance with contract specifications and the NAVFAC LANT APPLIED Integrated Natural Resources Management Plan (INRMP) recommendations.

3.2.4 Structural pests[87]

Structural pests that have an impact on activity operations include termites[88], powder post beetles[89], wood borers[90], and wood destroying fungi. Of these, subterranean termites and wood destroying (decay) fungi cause the most damage. A termite control program can be found in Appendix H[91].

3.2.4.1 Structural pests (Subterranean Termites, Dry-wood Termites, Wood Boring Beetles, etc.)

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. A termite control program is included in Appendix H.

3.2.4.2 Structural Control Program

A well managed structural pest control program[92] includes inspection, prevention and chemical treatments when needed. All susceptible structures that contain wood or with wooden structural members should be inspected on an annual basis. Detailed records of annual structural pest inspections and subsequent treatments must be maintained using the form "Termite and Wood Decay Inspection," included in Appendix C. Records should note when a building was inspected, the location of any infestation found, and the description of any treatment performed.

3.2.4.3 Utility Pole Inspection Program

A utility pole inspection and maintenance program should be implemented to extend the life of wooden utility poles. This is a very important program, for it will detect poles that need repair and lengthen their useful life. Those that need replacement are identified and can be removed before they become dangerous. Specifications for this program are included in NAVFAC SPECIFICATION, TS-20312 of October 1984, "Maintenance of Wooden Utility Poles[93]," found in Appendix L[94].

3.2.5 Administration of Termite Treatment Contracts and Warrantees

Various control techniques including: (1) the use of construction practices which protect wood from attack; (2) controlling moisture through proper drainage and ventilation; (3) the use of termiticides for barrier treatment of soil and hollow masonry units of building foundations; and (4) the use of treated wood and/or metal and concrete supporting structures, are part of an integrated approach to structural pest control. The major structural pest at this activity is the subterranean termite. Termite specimens should be submitted to NAVFAC LANT (Code EV51) for species identification and determination of corrective control actions. 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. 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. Care must be taken to prevent disruption of the treated 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 Family Housing where people are encouraged to beautify their yards. Disturbance of treated soil within one foot of the foundation cannot be allowed. Raised beds must be four-sided (i.e. not using the foundation as one side) and soil within one foot of the foundation cannot be cultivated for planting.

All wood that is damaged by termites or wood rot fungi should be replaced with treated wood to prevent future damage. Details on the purchase and use of treated wood products are included in NAVFAC SPECIFICATION, TS-20312 of October 1984, "Maintenance of Wooden Utility Poles[95]," located in Appendix L.

3.2.6 Stored Products Pests

Stored product pests[96] are a potential problem at NAS Key West. Receipt inspection and rejection of obviously infested materials generally prevents heavily infested material from being placed in the storage area.

3.2.6.1 Dermestid Beetles

If the dermestid beetle[97] *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. ULV space treatments and residual sprays are used to stop movement of an infestation to clean stock within the food storage areas of the food handling areas.

3.2.6.2 MRE Stores

More stringent controls are required for prevention of stored products pests. Guidance on this program can be found in Armed Forces Pest Management Board TG #38, included in Appendix L[98].

3.2.7 Health Related Pests[99]

Mosquitoes[100], biting gnats or sand gnats (Culicoides)[101] and filth flies[102] constitute the most important insect groups from the standpoint of both disease transmission and general annoyance. Operations directed at controlling potential disease vectors must be based on a thorough knowledge of the target pest. Survey operations are essential in determining 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.

3.2.7.1 Mosquito Surveillance

NAS Key West contracts with the Florida Keys Mosquito Control District for all mosquito control operations. Adult mosquito surveys are the responsibility of the Preventive Medicine Technicians. However, if the Preventive Medicine Technician is not available the Mosquito Control contractor may conduct the adult mosquito surveillance. Mosquito surveillance should have two basic activities. These activities include identifying and mapping larval habitats and monitoring adult activity. Both activities provide useful information in a proactive surveillance program. Mapping and monitoring larval habitats gives early estimates of future adult densities and, under some conditions, provides the information necessary to eliminate mosquitoes at the source. Light traps can be used to locate larval habitat. A high proportion of males in a light trap usually indicates a nearby larval breeding site.(CDC, Guidelines for Arbovirus Surveillance Programs in the US, April 1993) If male count numbers are proportionally high, a survey of the area should be done to locate possible breeding sites. Surveys include the collection and identification of adult mosquitoes and are performed using specialized light traps. There are six New Jersey Light traps, two CO2 Baited CDC light traps and three gravid traps at the Station, as indicated in Appendix A. Entomologists with the Navy Entomology Center of Excellence, Jacksonville are responsible for providing professional guidance, recommendations, and on-site assistance on all technical matters relating to disease vectors and other medically important pests.

3.2.7.2 Prominent Mosquito Species of Florida

See Appendix J for a distribution list of the mosquitoes of Florida

3.2.7.3 Mosquito Control

Larviciding is the most effective way to control mosquitoes. Larvicides should be applied when results of mosquito dip counts exceed two larvae per dip. Larvicides should be applied to areas where water stands for longer than 7 days. Biological control can be accomplished by the introduction of (Gambusia sp.). Gambusia are surface feeding fish which are predacious on mosquito larvae. To decrease the amount of standing water, it is important to have a drainage system allowing proper runoff of rainwater from roadways. The ditches should be maintained free of weed growth. This increases water flow in the ditch allowing access of natural mosquito predators.

When female adult mosquito counts from the **unbaited** CDC Light Traps exceed 20 per night in one trap and 100 per night from **baited** CDC Light Traps, Ultra Low Volume (ULV) insecticide treatments should initiated. An exhaustive survey of the area covered by the trap should be done to identify and treat the active breeding site. Mosquito activity is greatest from dusk to dawn. These treatments must be made during peak mosquito activity. ULV operations will be conducted in the early morning hours before the sun warms the ground, or in

the evening after the ground has cooled. 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 Armed Forces Pest Management Board Technical Guide #13, "Ultra Low Volume Dispersal of Insecticides by Ground Equipment" revised December 1999, provided in Appendix C. Slides for aerosol droplet size testing can be obtained from and analyzed by the Testing and Evaluation Department at the Navy Entomology Center of Excellence, Jacksonville, FL. If adult numbers are extremely high, aerial control by helicopter or fixed wing airplane may be necessary.

3.2.7.4 Filth Fly Management

Filth flies[103] (houseflies, blow flies, flesh flies, bottle flies, etc.) can be a problem during the warm summer months if high sanitation levels are not maintained. Timely disposal of garbage and routine cleaning of garbage cans (twice a week) and dumpsters helps to 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.

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 personnel also inspect these areas and report significant findings to appropriate people 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**. 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 this, see Armed Forces Pest Management Board Technical Guide No. 25, "Devices For Electrocuting Flying Insects," included in Appendix L.

3.2.7.5 Red Imported Fire Ant[104]

The red imported fire ant[105] is a problem at this activity. The fire ant with its mound building and stinging behavior interferes with recreational and grounds maintenance activities. Inspections for fire ant mounds are made in all improved and unimproved areas, with treatment as necessary. Any active mounds found in the interim are retreated. Bait and residual insecticides are available for control of fire ants.

3.2.7.6 Rodent Management[106]

Rodent control work[107] is an ongoing program to eliminate the causes of rodent infestations. Major emphasis is placed on the removal of available food supplies by cleaning up trash and removing vegetation, and exclusion by closing entry holes. The use of various anticoagulant bait materials provides a means of quickly reducing rodent populations. Bait stations are maintained in serious problem areas. Tamper-proof bait stations must be used in areas where children or pets may come into contact with them. Traps should be used in those areas where it is not advisable to use rodenticide baits[108] such as housing units and nurseries. Trapping is a particularly effective way of quickly reducing a large mouse population.

3.2.7.7 Bird Management[109]

Pigeons, seagulls, and English sparrows are the primary bird pests[110]. Many bird species require special permits before any control measures can be taken. Bird control is, by nature, dictated by the situation. Pigeons are an occasional problem in hangars, where they nest and roost on the overhead beams. Their droppings are corrosive to the equipment in the hanger. The droppings also pose a health hazard, as a possible cause of histoplasmosis and other respiratory problems when airborne. Their ectoparasites, such as mites[111], can also fall on workers in the hanger. 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. One method is to install plastic or nylon netting over the ceiling beams in the hanger. The netting must be hung around the lights so that they

could be accessed for changing the light bulbs. Population reduction techniques (i.e., 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.

3.2.7.8 Feral Cat and Raccoon Management[112]

Cats[113] and raccoons are a problem at NAS Key West, especially near food-handling areas. These animals are predators of the endangered Lower Keys marsh rabbit. They are often found dwelling in crawl spaces under buildings where they can cause flea problems inside the buildings. The elimination of available food by keeping garbage cans and dumpsters sealed will decrease to appeal of the area to the cats and raccoons. Elimination of shelter is also a good means of control. The activity should discourage people from feeding stray cats and raccoons. Live traps are used for the capture and subsequent transport of these cats and raccoons to the local animal shelter.

3.2.8 Pest Management in Quarters and Housing

3.2.8.1 Responsibilities

Residents of military quarters and housing shall practice good sanitation and correct minor nuisance pest problems (OPNAVINST 6250.4B[114], Encl 1, pg 4-10).
"Quarters and housing occupants are responsible for controlling pests such as cockroaches, household-infesting ants, and mice not originating in other quarters. Control of medically important pests including venomous arthropods, which could affect human health, and structural pests which could damage property, shall not be an occupant's responsibility." (OPNAVINST 6250.4B, Encl 1, pg 4-10[115]). The PMPAR and/or preventive medicine representative can determine whether a pest can cause health problems or property damage. Installation commanders shall ensure that pest management services are provided in military housing only when the pest threatens Government property or the occupants' health, and the occupants have been unable to control the pests through self-help efforts. (OPNAVINST 6250.4B, Encl 1, pg 4-10[116])

3.2.8.2 Self-help Program

Self-help pest management programs[117] are authorized for military family housing and bachelor housing facilities. Several pest control items are authorized for use by residents in these housing facilities without pesticide applicator certification. These items are primarily non-toxicant traps and low toxicity insecticide bait stations. A list of these items is found in Appendix E. Currently, no pest control items, such as traps and bait stations, are available to residents in the Station self-help shop. Residents may purchase pesticides and supplies from the Commissary, Minimart or from off-Station retail stores. Further self-help pest control information can be obtained from the AFPMB TG# 42[118]: Self-Help Pest Management.

3.2.8.3 Change-of-Occupancy Pest Control

Control of pests during change of occupancy in multi-family housing is a housing maintenance responsibility that is performed, if necessary, to prepare the house for the new occupants. The DoD policy regarding preventive pesticide applications applies to multi-family housing and is stated below in Section 3.2.9.2.

3.2.8.4 Pet Management

Pet dogs and cats released or lost by owners on the Station can become a pest problem. Feral cats and dogs are susceptible to and can carry disease, damage natural habitats, harm protected wild animals, become an aircraft or vehicle strike hazard, and attack and injure personnel. Micro-chipping[119] is a permanent pet identification[120] 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 Prohibited Operations and Devices

3.2.9.1 Application of liquid and dust formulations in 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." (OPNAVINST 5090.1B CH-2; Appendix C[121].)

3.2.9.2 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." (OPNAVINST 6250.4B, Appendix L. [122])

3.2.9.3 Electrically Operated Devices

"It is DoD policy to not use electromagnetic exclusion or control devices, ultrasonic repellent or control devices, and outdoor devices for electrocuting flying insects on DoD installations, except as noted in AFPMB TG 25: Devices for Electrocution of Flying Insects[123]. However, indoor devices for electrocuting flying insects can be used when selected, purchased, located, and used in accordance with AFPMB TG 25." (Appendix L[124])

3.3 Regulatory Compliance

3.3.1 Policy

Department of Defense policy is to ensure 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 most stringent of the two. This commonly occurs with pesticides limited for use by the State of Florida, which are not necessarily restricted by the EPA. In this case, the Station must comply with Florida regulations.

3.3.2 Pesticide Regulation and Enforcement

3.3.2.1 Pesticide Regulation

The EPA has the primary authority to regulate pesticides in the U.S. The EPA delegates pesticide enforcement authority to states through cooperative agreements. OPNAVINST 6250.4B, Appendix L[125] requires Navy and Marine Corps installations to comply with state and local pesticide use regulations.

3.3.2.2 Enforcement

The responsibility for compliance and enforcement lies with the installation CO. As the CO's pest management advisor, the IPMC shall be familiar with federal, state, and local pesticide use regulations and ensure that all PMSPs conduct operations in compliance with these regulations.

Commercial contractor applicators: PMPARs shall provide assistance by monitoring contract PMSPs on 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. PMTs conducting inspections of food service facility pest management programs may also be utilized to ensure compliance.

DoD applicators and PMPAR: Per DoD 4150.7-P[126], the DoD may deny, suspend, or revoke the certificate of any DoD employee who violates any provision of FIFRA or falsifies records under DoD 4150.7-P[127]. In accordance with DoD 4150.7-P[128], the installation CO may initiate a formal review if FIFRA violations are suspected. Violations shall be reported through appropriate command channels to the NAVFAC LANT APPLIED BIOLOGY certifying authority for review. The certifying authority shall determine if further action is required. That action may include suspension of the applicator's certification. See DoD 4150.7-P[129], Chapter 2, Para. D for more information.

The NAVFAC LANT APPLIED BIOLOGY shall provide the installation IPMC with assistance with compliance and enforcement issues and clarification of regulations. The senior pest management consultant is the certifying official for DoD certified pesticide applicator on the installation.

3.3.3 Laws and Regulations

3.3.3.1 Primary Pesticide Regulations

Federal: U.S. Code of Federal Regulations (CFR) at 40 CFR 152-180[130]
http://www.epa.gov/epahome/lawregs.htm[131]
DoD, Navy and Marine Corps: OPNAVINST 6250.4B, Appendix L[132]: Pest Management Programs; OPNAVINST 5090.1B CH-2[133] Environmental and Natural Resources Program Manual
State of Florida: The Florida Department of Agriculture and Consumer Services through the Bureau of Entomology and Pest Control, Pest Control Section, regulates the Structural Pest Control Industry by the authority granted by the Structural Pest Control Act, Chapter 482, Florida Statutes and the associated rules, Chapter 5E-14, Florida Administrative Code[134]
The primary source of pesticide regulations for the pesticide applicator is found on the pesticide label in accordance with 40 CFR 156[135]. Florida may add supplementary labels that are regulations and 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 Lower Keys marsh rabbit 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 NAS Key West Natural Resources Manager. For more on the pesticide label, see http://www.epa.gov/pesticides/label/.

3.3.3.2 Other Regulations

All applicable directives, laws and regulations concerning pesticide applications and pest management operations are listed and described in Appendix L[136].

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 labeling provides all 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:
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?
Choose a pesticide with a low toxicity. Can the pest be sufficiently controlled with a pesticide that has a low toxicity to humans?
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?
Choose pesticides that provide a long-term or sustainable solution. Example: Contact insecticides applied to ant trails will only temporarily halt the infestation, and may cause the colony to bud and form new colonies.

3.4.2 Pesticide Procurement by DoD Personnel

Most pesticides used by contractors are procured through commercial sources. Pesticides used by DoD personal may also be purchased through the Federal Stock System. Contractors cannot purchase pesticides through the Federal Stock System. A list of pesticides approved by DoD and found in the Stock System are found at http://www.afpmb.org/standardlist.htm.

Only pesticides listed on the activity's Approved Pesticide List (APL) in Appendix E[137] may be purchased. The APL must be reviewed annually and up dated as needed. If other pesticides are desired, a label and Planned Pesticide Use (PPU) sheet must be sent to NAVFAC LANT APPLIED BIOLOGY for approval.

3.4.3 Pesticide Storage

3.4.3.1 Pesticide Storage

No pesticide storage facilities are provided on the Station. Facilities for pesticide storage must meet the requirements of MIL-HDBK 1028/8A for the design of pest management facilities. (TG 17 - Military Handbook - Design of Pest Management Facilities.)

3.4.3.2 Retail Sale Pesticide Storage[138]

All household, pet and garden pesticides displayed and sold in the NEX garden shop and Commissary 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 6250.4B[139] and contract specifications. Pesticides shall not be transported in the vehicle's passenger compartment and pesticides shall be secured to vehicles to prevent spillage.

3.4.4 Mixing

Contracted pest control operators must mix pesticides in accordance with the pesticide label. Persons mixing pesticides with water shall protect the water supply form back-siphonage 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 5.2.3 for pesticide spill prevention and Station procedures. Spill kits must be maintained on pest control vehicles and must be available at the mixing site.

3.4.5 Application

3.4.5.1 Service containers

Containers other than the original pesticide container that is 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 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 all 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.

3.4.5.3 Pesticide Application

All pesticides shall be applied in accordance with Federal, State and label directions. Application of pesticides must 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 4.2.2.2 for more information on timing and drift prevention

3.4.6 Post-Application Clean Up

All pest control equipment shall be properly cleaned. Applicators shall clean equipment at an appropriate location that minimizes the risk of environmental contamination. Contract PMSPs are not allowed to dispose of excess pesticide, used containers, or residues on the Station per contract specifications; they must conduct all cleaning off-Station.

3.5 Pesticide Disposal

3.5.1 In-House Pest Management

The need for disposal of excess dilute pesticides should be minimized by careful estimation of the amounts required. Application in accordance with the pesticide label is the preferred method of "disposing" of dilute pesticides.

3.5.1.1 Sprayer Clean-Outs

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

3.5.1.2 Empty Containers

Reference (c) requires that pesticide wastes be disposed of in accordance with 40 Code of Federal Regulations (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% of the container's capacity divided into three doses. Disposal of empty containers will be coordinated with the Environmental Division. EMPTY CONTAINERS WILL NOT BE REUSED. If possible, pesticide containers shall be returned to the manufacturer for recycling.

3.5.1.3 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.

3.5.1.4 Excess Pesticides

Disposal or redistribution of excess pesticides shall be coordinated through Environmental and the IPMC. Defense Reutilization and Marketing Office (DRMO) and Hazardous Waste Minimization (HAZMIN) will determine whether the pesticide can be redistributed or needs to be disposed of. A clear and clean copy of the label and the MSDS should be provided when disposing of a pesticide. Excess pesticides shall never be disposed in any storm or sanitary sewer system.

3.5.2 Contractors

Contractors will be required to dispose of all pesticides, pesticide containers, traps, personal protective equipment, etc. off NAS Key West. The contractor/contractors will not be permitted to wash or rinse application equipment anywhere on the installation.

3.6 Cancelled Pesticides

In recent years several common organophosphate pesticide registrations have been cancelled or restricted. Chlorpyrifos (i.e., Dursban®, Lorsban®) and diazinon were widely use pesticides by private and commercial

pesticide users. Due to a reassessment of these pesticides, many household uses of these pesticides have been cancelled or restricted. Appendix E[140] contains a summary of the phase-out of these two chemicals. The following actions are required during the phase-out:

Prior to the stop-sale dates of the pesticides, the NEX and commissary should not procure and stock the pesticides and ensure sale of remaining stocks prior to the stop-sale date.

On the stop-sale dates of the pesticides, the NEX and commissary must remove them from their shelves and dispose of the material as hazardous waste.

After the stop-sale date, end users (e.g. PMSPs and private, residential users) are allowed to use the pesticides until depleted.

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.

4 Health and Safety

4.1 Pesticide Applicator and Public Safety

To ensure the safe use of pesticides, DoD personnel shall handle and apply pesticides in accordance with the product's label directions and AFPMB Technical Guides concerning safety. (OPNAVINST 6250.4B, Encl.1, p. 4-7[141])

4.1.1 Potential Occupational Hazards

These hazards may be encountered by pesticide applicators. They may also be encountered by PMPARs that may be exposed while inspecting pest management operations. Occupational Safety and Health guidance is found in the OPNAVINST 5100.23E CH 1[142]: 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; frequently due to not wearing the appropriate personal protective equipment. The 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) or chronic (slow or delayed onset; due to long term exposure to low dosage, low toxicity chemicals). The highest risk for severe chemical exposure occurs during pouring and mixing of concentrated pesticide.

4.1.1.2 Heat

The use of protective equipment such as respirator, goggles, gloves and coveralls increases the risk of heat injury especially in warm climates.

4.1.1.3 Noise

Some pesticide application equipment use gas powered air compressors or pumps. Powered backpack sprayers are particularly hazardous.

4.1.1.4 Eye Hazards

Eye hazards may result from chemical splashed into the eyes causing corrosive, toxic, or impact injury. Highest risk occurs during pesticide pouring, mixing and application. Injury may also occur during equipment cleaning.

4.1.1.5 Blood-borne Pathogens (Disease Hazards[143])

Rodents may carry human diseases such as plague and hantavirus. These diseases may be transmitted from the animal to humans through body fluid exposure. Pest management providers are exposed when handling rodent carcasses after trapping. 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. Personnel may be exposed during mixing, application and cleaning. Dried animal feces of infected animals are a source of disease transmission. Enclosed spaces increases the probability of transmission.

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, fall, and Trip 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. Special permits are required to enter areas determined to be a "Confined Space." Some pest control operations may involve climbing ladders or walking on roofs or other elevated surfaces where fall protection is required. 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 Exposure to Harmful Animals

Venomous animals such as bees, wasps, rattlesnakes and scorpions are potential hazards when attempting to control them. Some of these are very dangerous to those who are allergic. Feral dogs, cats, coyotes, raccoons and other large pest animals can inflict serious wounds. A Rabies vaccination is recommended for pest controllers.

4.1.1.10 Fumigation Hazard

Fumigation of structures or materiel is particularly hazardous to the applicator due to the high toxicity of many fumigants. Vikane® (sulfuryl fluoride) is the most frequently used fumigant for structural fumigation and is an odorless, colorless gas; thus it gives no warning as to its presence in the air. Fumigation is done in an enclosed space. This usually means placing a tarp over the structure or commodity to be fumigated. Due to the lethal concentrations it is very hazardous when trapped in an enclosed space. The gas is transported and applied from cylinders under high pressure, which poses a hazard in itself.

4.1.2 Hazard Abatement

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 by ORM. Pest management ORM uses the following process to minimize hazards:
Identify hazards – the hazards may involve the pesticide or the application equipment (see list of hazards above)
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.
Make risk decisions – Develop risk control options. Decide whether benefits of control outweigh the risks involved.
Implement controls
Engineering controls – Example: use a less toxic pesticide for controlling the pest
Administrative controls – Example: place warning placards around pesticide vehicles and pesticide storage areas
Personal protective equipment – Example: wear a respirator when an inhalation hazard exists
Supervise – Follow-up to determine effectiveness of controls and monitor changes to hazards.
For more information on ORM go to the USMC Safety website at http://www.hqmc.usmc.mil/safety.nsf.

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 included in DoD Directive 4150.7-P: DoD Plan for the Certification of Pesticide Applicators[144]. Safety topics are also given during recertification courses. The State of Florida maintains specific requirements for the continued training and certification of applicators. See section 2.3.1 for specific training information. Information on pesticides and other hazardous materials are communicated through the chemical Material Safety Data Sheets (MSDS) that are maintained by the PMSPs.

4.1.2.3 Personal Protective Equipment

Personal protective equipment or 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. PPE must be appropriate for the type and

application of the pesticide being used. It is the applicator's responsibility to maintain the PPE. The annual pest management budget should include the cost for fit testing and replacement of PPE due to normal wear and tear.

4.1.2.4 Industrial Hygiene Survey

Industrial Hygiene surveys are conducted at the PWD pest control shop. These surveys involve identifying the hazards that are encountered by the pest control operators while conducting various pest management practices and making recommendations on hazard risk reduction.

4.1.2.5 Medical Surveillance Program

DoD pesticide applicators are required to be in a medical surveillance program depending on their hazard exposure. Contract pest management companies must provide for the health and safety of their employees. Medical surveillance is conducted by the occupational health clinic in accordance with **Navy Environmental Health Center Technical Manual (NEHC TM) 6260:** Medical Surveillance Procedures Manual and Medical Matrix NEHC Technical Manuals[145] http://www-nehc.med.navy.mil/od/CDRomtoc.htm.

4.1.2.6 Fumigation project safety

Due to the hazards posed by fumigants, specific precautions must be taken and are required by regulation and/or are listed on the pesticide label. This includes the use of a warning agent such as chloropicrin, having a minimum of two persons on the fumigation site, donning of self-contained breathing apparatus (SCBA) before entering a fumigated building, monitoring of fumigant level, and posting of warning signs.

4.2 Public Safety

4.2.1 Potential hazards to public

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 contaminated food or eating utensils. This type of exposure can occur if pesticide applications are 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 were not properly protected or cleaned after application.

4.2.1.2 Pesticide drift

Pesticide drift occurs when a pesticide leaves the target area and affects unprotected persons outside the area. A drift can occur during routine application of a pesticide or from a spill. The most common form of drift is when winds can carry the pesticide off site. Pesticide applications that involve highly volatile chemicals or small pesticide droplets, such as fogging or ultra low volume (ULV) 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

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 hazards

The fumigation hazards that pose a health risk to the applicators also pose a health risk to personnel, particularly children, in the area surrounding the fumigation site. Vikane® requires 24 hours in which to circulate in the covered structure in order to effectively control pests. During this time, there is potential for someone to open up the tarp and enter the structure.

4.2.2 Hazard Abatement

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.

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 G90-1001-A[146] at http://www.ianr.unl.edu/pubs/pesticides/g1001.htm[147]).

Select low or nonvolatile pesticides.

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

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

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.

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

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

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

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

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

4.2.2.3 Water protection

Apply in accordance with Label directions or state environmental regulations.

4.2.2.4 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 injury risks.

4.2.2.5 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 Emergency Planning and Community Right-to-know Act (EPCRA)

Executive Order 12856 requires all Federal agencies, including DoD, to comply with the provisions of EPCRA. EPCRA is intended to 1) encourage and support emergency planning between the installation and the surrounding community, 2) provide the community with information about potential chemical hazards stored and used on the installation, and 3) establish a framework for local and state emergency planning. Chemical

lists and applicable EPCRA sections and threshold quantities are found in the EPA List of Lists at http://yosemite.epa.gov/oswer/ceppoweb.nsf/vwResourcesByFilename/title3.pdf/$File/title3.pdf.

4.2.3.1 Section 302: Emergency Planning Notification

Some pesticide active ingredients are extremely hazardous substances, however the installation stores other extremely hazardous substances that would require the installation to provide notification under this section.

4.2.3.2 Section 304: Emergency Release Notification

Extremely hazardous substances or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) listed hazardous substances that exceed a reportable quantity are accidentally released **must be reported** to local, state and federal authorities. Pesticides applied in accordance with the pesticide label are exempt from this requirement. Pesticide spills, are not exempt. The amount of pesticides stored, used and transported on the Station should be minimized to prevent accidental spills.

4.2.3.3 Section 311 and 312: Hazardous Chemical Inventory Reporting

This applies to OSHA hazardous chemicals, which are any chemicals with an MSDS. Nearly all the pesticides used on the installation have MSDSs. However, this applies to pesticide storage and pesticides in spray tanks and it is unlikely that pesticide amounts in storage will exceed the threshold quantity.

4.2.3.4 Section 313: Toxic Chemical Release Reporting

Application of pesticides on the Station are categorized as "otherwise use." The threshold quantity for most pesticide active ingredients is 10,000 lbs per year. It is highly unlikely that pesticide use will exceed this quantity. In addition, pesticide use in grounds maintenance and MWR recreational fields (i.e. ball fields and golf courses) are exempt. The medical clinic is also exempt.

4.2.4 IPM in Schools, Child Development Facilities and Public Buildings

The EPA and the University of Florida maintain websites for IPM in schools and Public buildings. This information and other congressional information (Florida IPM in Schools[148]) can be found in Appendix L[149].

4.2.4.1 SPECIFIC STATE LAWS:

Information specific to Florida IPM in Schools can be found at http://schoolipm.ifas.ufl.edu/[150].

5 Environmental Considerations

5.1 Vulnerable Assets

5.1.1 Mission

Pest management practices affect the installation's mission through depletion of NAS Key West resources that are needed to maintain the Station's training and deployment readiness mission. NAS Key West depends heavily on its people to accomplish its mission and maintains, stores, and moves valuable equipment and supplies. When pests affect human or material assets the financial costs can be high. Likewise, pest management practices must be managed in such a way as to prevent expenditures on unnecessary expensive or unproven pest control methods or mishaps due to improper handling of pesticides or equipment.

5.1.2 Human health and safety

The Navy depends on the readiness of its military members and invests resources on the quality of life for those members and their dependents. Force health protection includes protecting them from pests that cause impacts to their health and well-being. Pest management practices can effectively protect or adversely effect human health. Proper pest management and use of pesticides to control disease vectors and nuisance pests can lead to health protection and an enhanced quality of life. However, accidents involving pesticides and inappropriate or illegal use of pesticides can cause human poisoning or allergic reactions leading to acute or chronic health problems.

5.1.3 Environmental Resources

Air, water and soil risk contamination from pesticides. Drift of pesticides outside the target application areas are the primary reason for contamination. Pesticides that pose the highest risk of contamination are herbicides applied to improved and unimproved grounds. General household pest control chemicals are usually applied in small quantities indoors and pose a minimal risk. Mosquito larva control operations, although it uses a water-applied pesticide, poses a minimal risk due to the target-specific nature of the pesticide. (*Bacillus thuringiensis isreelis* (Bti))

5.1.4 Natural Resources

The mission of the natural resources program at NAS Key West is to support the Navy, Marine Corps and DoD through responsible stewardship of the installation's natural resources. The mission is achieved using integrated natural resources management and the principles of adaptive ecosystem management to ensure viability and biodiversity in the ecosystem while supporting compatible multiple uses. The recommendations developed by the natural resource program and the INRMP serve as the medium for the Station to ensure compliance with both federal and state environmental regulations as well as Department of Defense (DoD) and Navy policies, including pest management regulations.

A listing of endangered and threatened wildlife species with the potential to be located on NAS Key West are listed in the following table or in Appendix I[151] .

5.1.5 Public perception

Misuse of pesticides that lead to animal or human injury can lead to negative publicity for the Station. The same can occur if an accident results in a pesticide spill, especially if they occur off-Station or cause contamination of local natural or cultural resources.

5.2 Managing Environmental Impact

Many procedures to reduce the impact of pest management practices on vulnerable assets are already in place. Many of these are contained within existing Station environmental management plans.

5.2.1 Natural and Cultural Resources Protection

5.2.1.1 Pest management impact on natural resources

The following pest management operations can potentially impact the Station's natural resources.
Pesticides in the water may harm and deplete marine invertebrate animals that serve as food sources for protected animals.
Herbicides that drift off-target may kill plants that are critical to animal habitats or kill protected plants.
Direct pesticide exposure may cause acute or chronic injury to animals.
The noise of pesticide application equipment (i.e. powered sprayers, aircraft) may disturb and cause harassment of animals.
Pest management personnel intrusion into critical habitats may disturb, injure or destroy plants or animals.
Use of non-chemical control methods such as noise-makers and traps may disturb or harm non-target organisms.
Pesticides can contaminate water and soil.

5.2.1.2 Minimizing impact risks

The following IPM methods may be utilized to minimize the impact of pest management operations on natural resources:
Use of non-chemical methods, such as tidal marsh restoration, that minimize pesticide use and enhance the environment.
A comprehensive pest surveillance program that uses mapping to identify pest infestations and breeding.
Investigate uses of biological control methods where possible; such as mosquito fish, *Gambusia affinis*, or enhancement of native predators to control mosquito larvae.
Use non-chemical control methods for weeds including mechanical removal and elimination of plants by steam or hot water.
Use of less toxic and target pest specific pesticides such as *Bacillus thuringiensis isreelis* (Bti) and methoprene.
Precision targeting of pesticide applications to put pesticide where the pest is located. An example is herbicide application equipment that applies pesticide only to target vegetation (e.g., Weedseeker®).

5.2.2 Hazardous Materials and Hazardous Waste Management

Pesticides, being a hazardous material, shall be managed in accordance with OPNAVINST 510023.a. The appropriate use of pesticides produces very little hazardous waste. Rinsates containing pesticide residues usually have very small quantities of chemical and are often applied to the target pest site. 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 cancelled and the stop-use date has occurred. These pesticides may be disposed of as Universal Waste. The Standards for Universal Waste Management are found in 40 CFR Part 273. However, proper inventory management and pest management planning will prevent waste generation.

5.2.3 Spill Prevention

Installation spill prevention guidelines shall be followed as outlined within the Spill Prevention Control Countermeasures guidebook (40 CFR 112[152]). The following spill prevention actions shall be taken:
Spill kits shall be readily accessible in all pest management vehicles, mixing sites and pesticide storage facilities.
Pesticides shall only be stored in an area with containment, such as a berm, to hold a spill and without a floor drain.
Portable mixing pads shall be used when appropriate.

All pesticide applicators shall be familiar with the installation spill contingency plan.

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 Station spill contingency plan. Further information on preventing and controlling pesticide spills is contained in the AFPMB TG #15: Pesticide Spill Prevention and Management[153].

6 Emergency Pest Management

6.1 Public Health Emergencies

Pests become a public health emergency when the numbers of 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:

Natural or manmade disaster – This includes earthquakes, floods, vehicle accidents and terrorist attacks. Usually pest problems do not develop immediately. Public health pest problems may be the result of increased amounts of refuse, collapse of local infrastructure (i.e. lack of garbage pick up), decaying human and animal bodies, and accumulation of standing water. The potential consequences are disease outbreaks, particularly food-borne illness.

Vector-borne or zoonotic disease as indicated by the following:

Reports of human cases – Many human cases of vector-borne and zoonotic disease identified in local medical facilities. Immediate vector control may be necessary to prevent further transmission.

Detection of Infected mosquitoes or sentinel animals – Routine surveillance for vector-borne or zoonotic 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 indicate when vector control should be initiated or increased to prevent human disease.

6.1.1 The Emergency Disease Vector Plan

The Emergency Disease Vector Control Plan (EVDCP) for NAS Key West[154] is implemented and maintained by the local Naval Medical Clinic with the coordination of the Navy Entomology Center of Excellence (NECE) Jacksonville. This plan can be found in Appendix J[155].

6.2 Agricultural emergencies

Agricultural emergencies are the result of the introduction of insects, animals, plants or diseases that can cause extensive damage to agriculture or forestry in the State. Examples of the pests are Mexican fruit fly and gypsy moth citrus cankers.

6.3 Emergency Pest Management Resources

PMSPs maintain pesticides and equipment to manage most emergencies, but emergency services must be included in the contract specifications. The Station has developed an Emergency Vector-borne Disease Control Plan (EVDCP) to manage public health emergencies (Appendix J[156]). It includes additional Navy, Federal, and local government contingency vector surveillance and control resources.

7 Program Resources

The Station has access to the following support agencies and organizations for pest management assistance. Contact information is located in Appendix C[157].

7.1 NAVFAC ATLANTIC

NAVFAC LANT APPLIED BIOLOGY is staffed by four full time civilian DoD entomologists[158] in Norfolk, VA. All are certified in DoD pesticide applicator categories 3,5,6,7,8 and 11. These personnel are assigned the following responsibilities:
Review and approve the IPMP in accordance with DoD and Navy policy;
Provide technical assistance to the installation IPMC, environmental manager, safety officer, medical officer and other regional and installation personnel regarding pest management and pesticide regulatory compliance;
Review and approve or reject pesticides and equipment to be used on the installation;
Conduct on-site program reviews and environmental compliance program external assessments (EA) to ensure compliance with the regulations and the IPMP; and
Compile and report actual pesticide use and pest management operations to appropriate DoD agencies.
Consultation includes IPM recommendations and pest identification. They are also the NAVFAC APPLIED BIOLOGY point of contact for pesticide regulations and compliance. They can be contracted on a reimbursable basis to write or re-write IPMPs. Pest management training and certification for DoD personnel are provided annually by NAVFAC LANT APPLIED BIOLOGY and other DoD services.

7.2 Navy Entomology Center of Excellence (NECE)

Full-time active duty U.S. Navy entomologists currently staff NECE. The entomologists are certified in DoD pesticide applicator categories 3,5,6,7,8 and 11 and are assigned the following responsibilities:
Act as Navy Medicine (BUMED) Professional Pest Management Consultant to provide BUMED review and approval of IPMP;
Provide technical assistance to the Station on the surveillance and control of vectors on installation; Provide vector-borne disease risk assessments and disease prevention recommendations when requested. They are capable of providing contingency pest management in the event of a disaster or disease outbreak. Contingency requests must be made through the Navy Environmental Health Center, Portsmouth, VA.

7.2.1 Navy Entomology Center of Excellence Jacksonville, FL

http://www-nehc.med.navy.mil/[159]

Navy Entomology Center of Excellence
Naval Air Station
P. O. Box 43 Bldg 937
Jacksonville, Florida 32212-0043
Commercial: (904) 542-2424
DSN: 942-2424

7.2.2 Naval Environmental Health Center

http://www-nehc.med.navy.mil/[160]

7.3 University of Florida Cooperative Extension Service

http://solutionsforyourlife.ufl.edu/[161]

7.3.1 Florida Department of Agriculture and Consumer Services (DACS)[162]

The Division of Agricultural Environmental Services administers various state and federal regulatory programs concerning *environmental and consumer protection issues*. These include state mosquito control program coordination; agricultural pesticide registration, testing and regulation; pest control regulation; and feed, seed and fertilizer production inspection and testing. http://www.doacs.state.fl.us/

7.3.2 State of Florida Bureau of Entomology and Pest Control[163]

The Bureau of Entomology and Pest Control's mission is to protect the health and safety of the State's consumers and environment by regulating the mosquito control and pest control industries to improve the quality of services provided and reduce the hazards associated with unlicensed pest control activity. The Bureau also administers the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as it relates to these activities under a cooperative agreement with the U.S. Environmental Protection Agency (EPA).

A-APPENDIX

Maps

B-APPENDIX
Abbreviations


Acronyms


DEFINITIONS

C-APPENDIX
Coordination

NAVFAC Atlantic Applied Biology Team Members and regional POCs

D-APPENDIX
IPMP Update Form & Program Review

E-APPENDIX

Pesticides

F-APPENDIX
Equipment

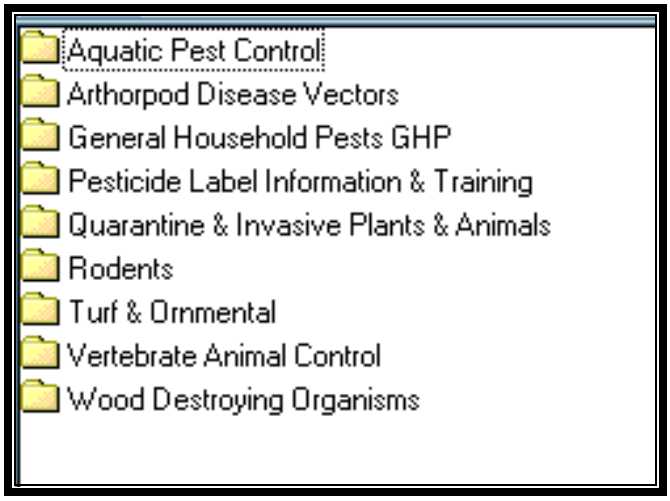
IN08000 Insect Traps

IN17100 Mosquito Control Devices

Inventory of Shop Equipment NASKWFL

G-APPENDIX
Contracts

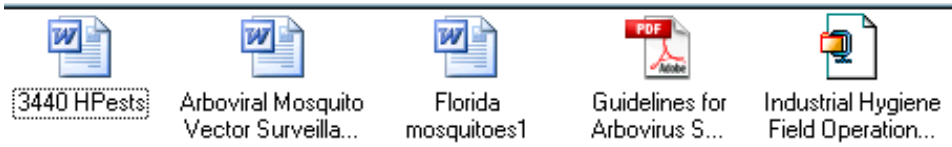
H-APPENDIX
Pest Control Programs and Information



I-APPENDIX
Environmental

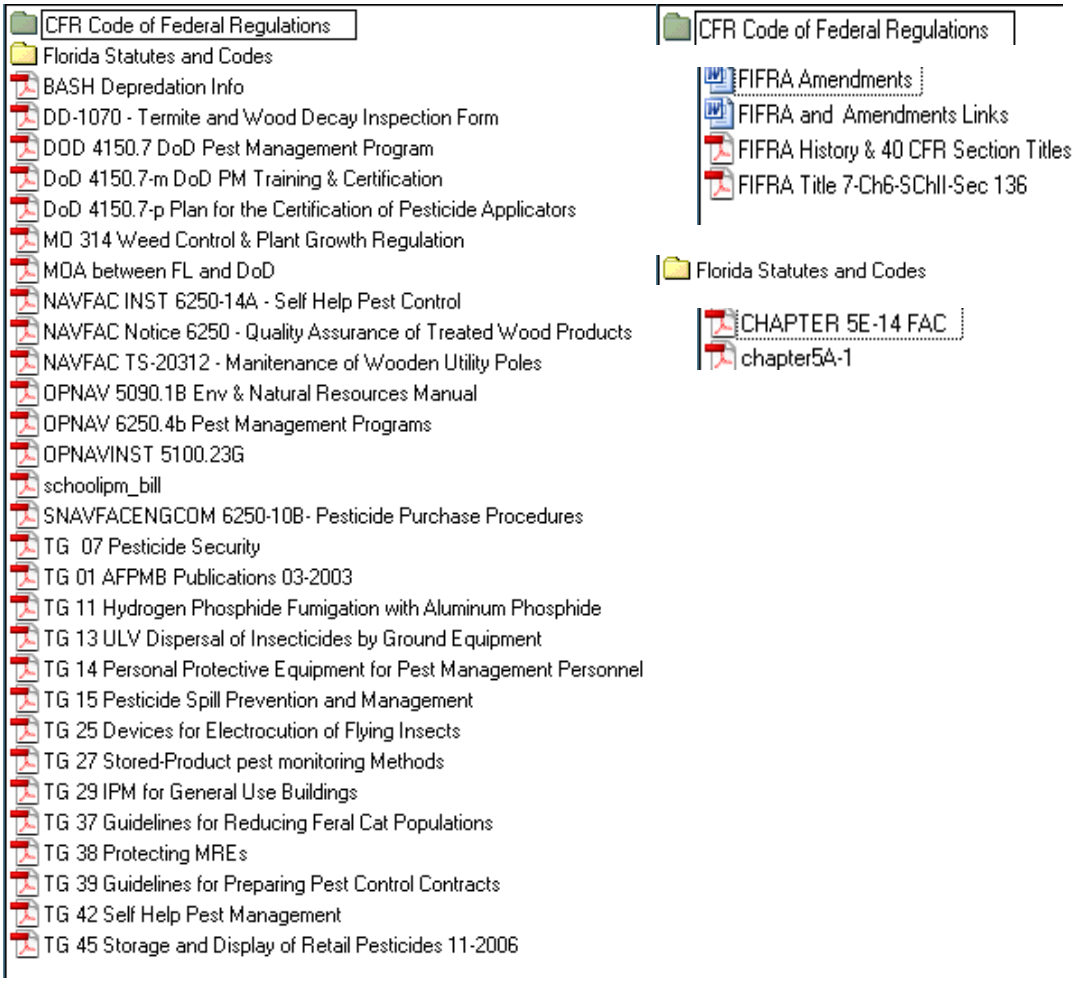
List of Endangered or Threatened Species NAS Key West FL

J-APPENDIX
Emergency Disease Vector Control Plan / Mosquito Distribution List



K-APPENDIX
Applicator Licenses and Certifications, Appointment Letters

L-APPENDIX
Laws Regulations and Publications



M-APPENDIX Other

N-APPENDIX END NOTE REFERENCES and LINKS to the CD Rom IPMP

[1] Open IPMP CD Rom to Appendices/Appendix, A Maps

[2] Open IPMP CD Rom to Appendices/Appendix, B Abbreviations

[3] Open IPMP CD Rom to Appendices/Appendix, C Coordination

[4] Open IPMP CD Rom to Appendices/Appendix, D Program, Review

[5] Open IPMP CD Rom to Appendices/Appendix, G Contracts

[6] Open IPMP CD Rom to Appendices/Appendix, F Equipment

[7] Open IPMP CD Rom to Appendices/Appendix, G Contracts

[8] Open IPMP CD Rom to Appendices/Appendix, H Pest Control Programs and Information

[9] Open IPMP CD Rom to Appendices/Appendix, I Environmental

[10] Open IPMP CD Rom to Appendices/Appendix, J EDVCP, Mosquito Distribution List

[11] Open IPMP CD Rom to Appendices/Appendix, K Licenses, and, Certification,, Appointment, Letters

[12] Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications

[13] Open IPMP CD Rom to Appendices/Appendix N End Notes and References

[14] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[15] DoN. (2007, 30 October). *OPNAVINST 5090.1C Environmental Readiness Program Manual*. (N45). Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[16] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[17] Appendices/Appendix L Laws, Regs & Publications/DOD 4150.7 DoD Pest Management Program. PDF

[18] Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications

[19] DoN. OPNAVINST 6250. 4B is signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps and is the pest management program directive for Navy and Marine Corps installations and operations. As of October 2002, OPNAVINST 6250.4C has been drafted and will be published soon.

[20] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[21] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[22] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[23] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[24] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[25] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[26] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[27] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[28] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[29] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[30] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[31] FIFRA

[32] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[33] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[34] Open IPMP CD Rom to Appendices, Appendix Laws, Regs & Publications/CFR Code of Federal Regulations/FIFRA Title 7-Ch6-SChII-Sec 136.pdf

[35] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[36] Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications/TG 07 Pesticide Security.pdf

[37] Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications/Florida Statutes and Codes/CHAPTER, 5E-14, FAC.pdf

[38] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[39] Appendices/Appendix L Laws, Regs & Publications/Florida Statutes and Codes/CHAPTER 5E-14 FAC.PDF

[40] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[41] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

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[43] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[44] DoN. 2005, 30 December OPNAVINST 5100.23g Navy Safety And Occupational Health (SOH) Program Manual N09f

[45] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[46] 7 U.S.C. § 136 et seq. Federal Insecticide, Fungicide, and Rodenticide Act(FIFRA) as amended

[47] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[48] DoN. OPNAVINST 5090.1C, ENVIRONMENTAL READINESS PROGRAM MANUAL. (N45), 30 Oct 07: Open IPMP CD Rom to Appendices, Appendix L, Laws, Regs & Publications, OPNAVINST 5090.1C (2) Complete Manual. PDF

[49] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[50] Open IPMP CD Rom to Appendices\Appendix K Licenses and Certification, Appointment Letters

[51] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest

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[52] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[53]Open IPMP CD Rom to
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[54]Open IPMP CD Rom to
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Appendices/Appendix L Laws, Regs & Publications/Florida Statutes and Codes/chapter5A-1.pdf

[58] Florida Department of Agriculture and Consumer Services Website
http://www.doacs.state.fl.us/onestop/aes/pestapp.html

[59] Open IPMP CD Rom to Appendices\Appendix K Licenses and Certification, Appointment Letters

[60] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[61] Open IPMP CD Rom to Appendices\Appendix C Coordination\NAVFAC Atlantic Applied Biology Team Members and regional POCs 2007.doc

[62] Open IPMP CD Rom to Appendices\Appendix K Licenses and Certification, Appointment Letters

[63]

[64] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[65] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\TG 39 Guidelines for Preparing Pest Control Contracts. PDF

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[67] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[68] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[69] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\General Household Pests GHP

[70] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\General Household Pests GHP\Cockroaches

[71] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\General Household Pests GHP\Cockroaches\IG11500 German Cockroach Management. PDF

[72] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental

[73] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Turf Insect Pests\White grubs control ANR-0177.pdf

[74] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Turf Insect Pests\LH03900 Mole Cricket Management in Turf. PDF

[75] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Turf Insect Pests\g07200 White Grubs in Lawns.PDF

[76] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Turf Insect Pests\LH03600 Chinch Bug Management St. Augustine grass. PDF

[77] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Ornamental plants and Trees\IN00800 Scale Insects Affecting Ornamental Plants.PDF

[78] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornmental\Ornamental plants and Trees\IG01300 Insect Management on Landscape Plants.PDF

[79] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Ornamental plants and Trees\MG00700 Insect Borers of Trees and Shrubs. PDF

[80] Turf & Ornmental\Diseases\LH04000 Turf grass Disease Management.PDF

[81] Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Turf Insect Pests\LH03900 Mole Cricket Management in Turf.PDF

[82] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornamental\Turf Insect Pests\Mole Crickets ANR-0176.pdf

[83] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornmental\\Nematodes\NG03900 Nematode Management in Residential Lawns.pdf

[84] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornmental\Diseases

[85]Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Turf & Ornmental\Weed Management\WG04100 Principles of Weed Management.pdf

[86] Open IPMP CD Rom to Appendices \Appendix H Pest Control Programs and Information\Aquatic Pest Control.

[87] Open IPMP CD Rom to Appendices \Appendix H Pest Control Programs and Information\Wood Destroying Organisms.

[88] Open IPMP CD Rom to Appendices Appendix H\Pest Control \Programs and Information/Wood Destroying Organisms/Subterranean Termites/Subterranean Termites IG09700.pdf

[89] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Wood Destroying Organisms\Wood destroying Beetles\Powderpost Beetles IG11900.pdf

[90] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Wood Destroying Organisms\Wood destroying Beetles\Wood boring Beetles USDA.pdf

[91] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Wood Destroying Organisms

[92] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Wood Destroying Organisms\Termite Control Plan.doc

[93] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\NAVFAC TS-20312 - Manitenance of Wooden Utility Poles.pdf

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[95] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\NAVFAC TS-20312 - Manitenance of Wooden Utility Poles.pdf

[96] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\General Household Pests GHP\Stored Products Pests\IG09500 Pantry and Stored Product Pests.pdf

[97] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\General Household Pests GHP\Stored Products Pests\dermestid beetle Trogoderma IN66700.pdf

[98] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\TG 38 Protecting MREs.pdf

[99] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Arthorpod Disease Vectors

[100] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Arthorpod Disease Vectors\Mosquitoes\IN47300 Mosquitoes in & around the Home.pdf

[101] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Arthorpod Disease Vectors\Flies\IG08100 Biting Flies.pdf

[102] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Arthorpod Disease Vectors\Flies\IG09100 Filth Breeding Flies.pdf

[103] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Arthorpod Disease Vectors\Flies\IG09100 Filth Breeding Flies.pdf

[104] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Turf & Ornmental\Turf Insect Pests\FIRE ANTS

[105] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Turf & Ornmental\Turf Insect Pests\FIRE ANTS\Fire_Ant Manual USDA.pdf

[106] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Rodents

[107] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Rodents\IPM Rodent Control\IPM Manual of Rodent Control -CDC.pdf

[108] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Rodents\IPM Rodent Control\PI11300 Pesticide Toxicity Profile Coumarin and Indandione Rodenticides.pdf

[109] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Vertebrate Animal Control

[110] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Vertebrate Animal Control

[111] Open IPMP CD Rom Appendices\Appendix H Pest Control Programs and Information\Vertebrate Animal Control\PS01900 Bird Diseases to Humans.pdf

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[115] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[116] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[117] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\TG 42 Self Help Pest Management.pdf

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[119] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Vertebrate Animal Control\Microchip Technology.pdf

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[123] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\TG 25 Devices for Electrocution of Flying Insects.pdf

[124] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications

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[126] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\DoD 4150.7-p Plan for the Certification of Pesticide Applicators.pdf

[127] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\DoD 4150.7-p Plan for the Certification of Pesticide Applicators.pdf

[128] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\DoD 4150.7-p Plan for the Certification of Pesticide Applicators.pdf

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[133] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[134] http://www.flaes.org/complimonitoring/pesticidecompliance.html

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[136] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications

[137] Open IPMP CD Rom Appendices\Appendix E Pesticides

[138] Open IPMP CD Rom Appendices\Appendix L Laws, Regs & Publications\TG 45 Storage and Display of Retail Pesticides 11-2006.pdf

[139] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

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[141] DoN. (1998, 27 August). *OPNAVINST 6250.4B Pest management Programs.* N451, CMC (LFL). Signed jointly by the Chief of Naval Operations and the Commandant of the Marine Corps, this instruction is the Pest Management Program directive for Navy and Marine Corps installations and operations. Open IPMP CD Rom to Appendices/Appendix L Laws, Regs & Publications.

[142] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\OPNAVINST 5100.23G.pdf

[143] Open IPMP CD Rom to Appendices\Appendix H Pest Control Programs and Information\Rodents\Rodents as Disease Vectors\Diseases Directly Transmitted by Rodents.pdf

[144] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\DoD 4150.7-p Plan for the Certification of Pesticide Applicators.pdf

[145] http://www-nehc.med.navy.mil/od/CDRomtoc.htm

[146] Open IPMP CD Rom to Appendices/Appendix E, Pesticides/g1773 Controlling Drift.pdf

[147] http://www.ianr.unl.edu/pubs/pesticides/g1001.htm

[148] Appendices\Appendix L Laws, Regs & Publications\schoolipm_bill.pdf

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[151] Open IPMP CD Rom to Appendices\Appendix I Environmental\List of Endangered or Threatened Species NAS Key West FL.doc

[152] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\CFR Code of Federal Regulations\FIFRA History & 40 CFR Section Titles.pdf

[153] Open IPMP CD Rom to Appendices\Appendix L Laws, Regs & Publications\TG 15 Pesticide Spill Prevention and Management.pdf

[154] Open IPMP CD Rom to Appendices\Appendix J EDVCP - Mosquito Distribution List\3440 HPests.doc

[155] Open IPMP CD Rom to Appendices\Appendix J EDVCP - Mosquito Distribution List

[156] Open IPMP CD Rom to Appendices\Appendix J EDVCP - Mosquito Distribution List

[157] Open IPMP CD Rom to Appendices\Appendix C Coordination\NAVFAC Atlantic Applied Biology Team Members and regional POCs 2007.doc

[158] Open IPMP CD Rom to Appendices\Appendix C Coordination\NAVFAC Atlantic Applied Biology Team Members and regional POCs 2007.doc

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[162] Florida Department of Agriculture and Consumer Services (DACS)

[163] State of Florida Bureau of Entomology and Pest Control