

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
BUREAU OF FORESTRY
DIVISION OF FOREST HEALTH

2019 GYPSY MOTH SUPPRESSION PROJECT

CONTRACT SPECIFICATIONS

Project FPM 19-01 (Rotary-Btk)

Note: The Department of Conservation and Natural Resources will hereinafter be referred to as The Department.

Table of Contents

SECTION 1: INTRODUCTION.....	6
SECTION 2: GENERAL STIPULATIONS.....	7
2.1 BIDDER'S QUALIFICATIONS.....	7
2.2 SCOPE OF CONTRACT.....	7
2.3 AREA TO BE TREATED	7
2.4 APPLICATION PERIOD AND STARTING DATE	7
2.5 AIRCRAFT RECALL.....	7
2.6 CONTRACT PERIOD	8
2.7 PAYMENT	8
2.8 EXPERIMENTAL SPRAYING.....	8
2.9 CONTRACTED ACREAGE.....	8
2.10 DELETING ACREAGE	8
2.11 CANCELLATION	8
SECTION 3. AWARDING CONTRACT.....	9
3.1 NOTIFICATION OF LOWEST QUALIFIED RESPONSIBLE BIDDER.....	9
3.2 CONDITIONS TO BE MET.....	9
3.3 WITHDRAWAL OF AWARD.....	11
SECTION 4. PROJECT SPECIFICATIONS.....	11
4.1 PROJECT NUMBER FPM 19-01 (Rotary-Btk)	11
SECTION 5. OBLIGATIONS OF THE CONTRACTOR.....	12
5.1 GENERAL	12
5.2 PESTICIDE APPLICATION BUSINESS LICENSE.....	12
5.3 PROOF OF INSURANCE.....	12
5.4 REGISTERING TO DO BUSINESS IN PENNSYLVANIA.....	13
5.5 FAA WAIVER FOR CONGESTED AREAS.....	13
5.6 SPRAY MATERIALS	13
5.7 LOADING ZONES OR AIRFIELDS.....	13
5.8 MAINTENANCE.....	14
5.9 SECURITY.....	14
5.10 FIELD EXPENSES AND TRANSPORTATION	14
5.11 SPILL CLEANUP EXPENSES.....	14
5.12 SAFETY PLAN.....	15

5.13	ATTENDING PRE-WORK BRIEFING	15
5.14	ATTENDING POST-SPRAY MEETING	15
SECTION 6. OBLIGATIONS OF THE DEPARTMENT		15
6.1	DEPARTMENT PERSONNEL	15
6.2	PRE-WORK BRIEFING	17
6.3	PRE-SPRAY MEETING	17
6.4	POST-SPRAY MEETING	17
6.5	EVALUATION AND PLANNING.....	17
6.6	MAPS.....	17
6.7	GIS FILES.....	17
6.8	DAILY AIRCRAFT RECORD (DAR).....	18
6.9	WAIVERS FOR SPECIAL USE AIRSPACE (RESTRICTED AND PROHIBITED AREAS).....	18
6.10	THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT.....	18
SECTION 7. INSECTICIDES AND ADJUVANTS		18
7.1	PURCHASING, STORAGE, AND TRANSPORTATION	18
7.2	ADDITIONAL ACREAGE.....	18
7.3	LABELS AND SAFETY DATA SHEET (SDS)	18
7.4	INSECTICIDES	18
7.5	ACCEPTABLE BTK FORMULATIONS	19
7.6	CONTAINER DISPOSAL	19
7.7	APPLICATIONS/RATES/SPRAY VOLUME.....	19
7.8	OPERATIONS	19
SECTION 8. APPLICATION SPECIFICATIONS, CONDITIONS, AND RESTRICTIONS		19
8.1	SAFETY	19
8.2	LOGISTICS.....	20
8.3	WEATHER RESTRICTIONS.....	20
8.4	ACCURACY.....	20
8.5	RECONNAISSANCE	21
8.6	FERRY FLIGHTS	21
8.7	SPRAY TIME POLICY	21
8.8	TIME-OF-SPRAY RESTRICTIONS.....	21
8.9	EVENING SPRAYING	21
8.10	AIRSPEED.....	22

8.11	APPLICATION ALTITUDE.....	22
8.12	TURNS.....	22
SECTION 9.	CONTRACTOR PERSONNEL.....	22
9.1	PROJECT SUPERVISOR.....	22
9.2	GROUND-SUPPORT PERSONNEL.....	22
9.3	PILOTS.....	23
9.4	OBSERVATION AIRCRAFT PILOT/NAVIGATOR.....	26
SECTION 10.	AIRCRAFT.....	26
10.1	GENERAL SPECIFICATIONS AND OPERATIONAL LIMITATIONS.....	26
10.2	OBSERVATION AIRCRAFT.....	28
10.3	AIRCRAFT CATEGORIES.....	28
10.4	AIRCRAFT SPRAY SYSTEM.....	29
10.5	ELECTRONIC RADIO, DGPS, AND TELEPHONE EQUIPMENT.....	32
10.6	NAVIGATIONAL AIDS.....	34
10.7	AUTOMATED FLIGHT FOLLOWING.....	36
SECTION 11.	GROUND-SUPPORT EQUIPMENT.....	37
11.1	INSPECTION.....	37
11.2	ACCESSORY EQUIPMENT.....	37
11.3	EQUIPMENT CLEANING.....	37
11.4	FIELD TRUCKS.....	37
11.5	TANK FARM.....	38
11.6	FUEL TRUCKS.....	38
11.7	TANKS.....	39
11.8	PUMPS.....	39
11.9	METERS.....	40
SECTION 12.	BONDS AND INSURANCE.....	40
12.1	PERFORMANCE BOND AND LABOR AND MATERIAL BOND.....	40
12.2	INSURANCE.....	41
SECTION 13.	AGREED LIQUIDATED DAMAGES FOR FAILURE TO PERFORM.....	42
13.1	INTRODUCTION.....	42
13.2	LATE ARRIVAL.....	43
13.3	TARDINESS.....	43
13.4	DELAYS.....	43

13.5	LOADING ZONES	44
13.6	IMPROPER APPLICATION	44
13.7	OTHER SPRAYING.....	44
13.8	INSECTICIDE LOSSES, SPILLS, AND DUMPS	44
13.9	POOR PILOT PERFORMANCE	44
13.10	AIRCRAFT MALFUNCTION.....	44
13.11	DGPS DATA.....	45
SECTION 14.	BID AWARD	45
SECTION 15.	CONTRACT TERM	45
SECTION 16.	INVOICES	46
SECTION 17.	RECEIPT AND OPENING OF BIDS	46
SECTION 18.	BID RESULTS.....	47
APPENDIX.....		48
APPENDIX A:	Map of Project Area	48
APPENDIX B:	Contractor Submittal Sheet.....	49
ATTACHMENT 1:	SPRAY AIRCRAFT PILOT APPROVAL FORM.....	50
ATTACHMENT 2:	AIRCRAFT DESCRIPTION FORM	52
ATTACHMENT 3:	Automated Flight Following.....	54

SECTION 1: INTRODUCTION

The Pennsylvania Department of Conservation and Natural Resources (The Department or DCNR) requires the services of a contractor for the aerial application of insecticides over certain populated and non-populated forested areas in the Commonwealth of Pennsylvania to prevent defoliation of high-value trees by the gypsy moth, *Lymantria dispar*, on approximately **1,651 acres**. One Project is listed in these specifications for 2019:

1) **Project FPM 19-01 (Rotary-Btk)** for approximately **1,651** acres in 2019; acreage for future years will not be known until December 1 of the preceding year.

The Contract will be awarded to the lowest responsive and responsible bidder for the project.

The target insect, acres, and types and categories of aircraft required for each project are detailed in Section 4. **Unless otherwise specified in Section 4, the Contractor is required to provide the insecticide and its cost must be included in the per acre bid for each project.**

For more specific information on the treatment area locations, topography, acreage, aircraft designation, project logistics, and other details of the project and to review maps of these areas, contact the Field Operations Supervisor designated in Section 4 and listed below.

Questions concerning the technical aspects of the bid should be directed to the following:

Donald A. Eggen, Ph.D.
Division Chief/Forest Health Manager
(717) 787-2336
deggen@pa.gov

Mark Faulkenberry Ph.D.
Program Services & Support Section Supervisor
(717) 346-2016
mfaulkenbe@pa.gov

Timothy R. Marasco
Field Operations Section Supervisor
(717) 783-0995
tmarasco@pa.gov

DCNR Bureau of Forestry
Division of Forest Health
400 Market St., 6th Floor, PO Box 8552
Harrisburg, PA 17105-8552
Main: (717)783-2066 or (717)783-3347
Fax: (717)783-7960

Questions concerning the contract or bidding procedures should be directed to the following:

Carol Durham
Purchasing Agent
(717) 783-3309
cdurham@pa.gov

DCNR Division of Procurement & Supply
Rachel Carson State Office Bldg.
PO Box 8769 - 400 Market Street
Harrisburg, PA 17105-8769

Note: A **Pre-Bid Meeting** will be held on **January 29, 2019, from 10:00 a.m. to 12:00 noon**. The meeting will be held in the DCNR Rachel Carson State Office Bldg. located at 400 Market St., 10th Floor Conference Room, Harrisburg, Pennsylvania. **This meeting is not mandatory**. Staff will present the suppression program objectives, information on products to be used, and technology interface requirements, as well as the mechanical and support aspects, including safety and security requirements needed for the successful development and conclusion of the program. **Attendees should register prior to the meeting date by contacting Mark Faulkenberry at 717-346-2016 or by e-mail at mfaulkenbe@pa.gov.**

SECTION 2: GENERAL STIPULATIONS

- 2.1 BIDDER'S QUALIFICATIONS** - To bid on this contract a Contractor must maintain a principal base of operations. Further, the Contractor may also, at their discretion, operate a main operations base and a main maintenance base pursuant to part 119.47 of Title 14 of the Code of Federal Regulations (CFR). The Contractor must conduct operations specified herein under the applicable section of the Federal Aviation Regulations (FAR) to include, but not limited to, 14 CFR Part 137. Contractor must possess or obtain a Pennsylvania pesticide application business license prior to treatment.
- 2.2 SCOPE OF CONTRACT** - It is the purpose and intent of this document to provide specifications for aircraft, insecticide, equipment, application, and other operational requirements necessary for a properly prepared and executed Agreement and for securing properly certificated and approved aircraft, dispersal systems, service facilities, qualified ground personnel, and FAA certificated and qualified pilots capable of making a proper aerial application of insecticide and performing necessary related functions.
- 2.3 AREA TO BE TREATED** - A total of approximately 1,651 ($\pm 15\%$) acres of privately-owned lands in the Commonwealth of Pennsylvania consisting of approximately 22 spray blocks are proposed for treatment. More specific information is found in Section 4, and maps are in the appendices (maps available upon request to Timothy Marasco at 717-783-0995). The treatment areas consist of forested residential areas and local municipal forest lands. In general, the areas are high-use areas, some of which contain permanent and/or seasonal residences, where proper and careful insecticide application is essential to prevent defoliation of high-value trees. The Contractor will not be paid for any acreage treated outside the designated block boundaries.
- 2.4 APPLICATION PERIOD AND STARTING DATE** - The application period begins on the date when the Contractor is required to report on site and continues until the final acceptable application is made. It is our objective to get all applications applied consistent with program requirements and restraints in as short a period of time as possible. Weather conditions that influence insect and tree foliage development will determine the specific starting date of the application period in each project. Estimated starting dates, based upon previous experience, are given in Section 4. The project is to be completed within **2** to **10** days depending upon weather and leaf and insect development. It is possible that the starting date could start a minimum of 15 days earlier or later than estimated in Section 4. **Five** days advance notice will be given to the Contractor of the date on which to report. The reporting date may be adjusted by mutual agreement due to inclement weather or other reasons beyond the control of either party.
- The Department reserves the right to start all the aircraft required in a project on the same date or to separate the starting dates for particular aircraft by several days and reserves the right to suspend operations based on differences in insect development or phenology.
- 2.5 AIRCRAFT RECALL** -The Contractor is required to keep one aircraft, an approved pilot, ground-support equipment and crew on recall status for a period of ten workdays (Monday through Friday, excluding holidays) after the final spray block in the project is completed. This aircraft will be recalled on 48 hours' notice to treat any approved areas that were deleted by the Department from the project but then experienced an unexpected outbreak, or to treat any areas that were missed, or to retreat areas because of faulty application, wash-off, or

inadequate insecticide effectiveness. The Contractor will not be compensated for any recall spraying or re-spraying that result from misses or faulty application in excess of two (2) percent of the total contracted acreage.

- 2.6 CONTRACT PERIOD** - This contract shall commence upon execution and receipt of the Purchase Order and Notice to Proceed Letter and will terminate **December 31, 2019**. Furthermore this contract may be renewed as indicated in Section 15.
- 2.7 PAYMENT** - Payment will be on a reimbursement basis for actual services performed, upon receipt of invoice(s) from the Contractor. Payment will be issued based on Department personnel's verification of daily insecticide load sheets (Daily Aircraft Records – DAR) and approval by the Program Supervisor or his/her designee.
- 2.8 EXPERIMENTAL SPRAYING** - The Department may request a successful bidder to conduct a small amount of experimental spraying. This would be done to gain knowledge and experience with new insecticides, formulations, equipment, and/or technology to evaluate their operational potential. In such cases, equitable compensation would be negotiated if extra work or expense is involved.
- 2.9 CONTRACTED ACREAGE** - If anticipated state, county, and/or federal funds are not available at a level sufficient to fund the Contract at the level bid, or if acreage must be dropped for any reason prior to the execution of the Contract, the Contract either will not be executed or the Contract acreage will be reduced in scope. In the event the Contract acreage must be reduced from that designated in Section 2.3 and in Section 4, the Contract will be written to reflect the reduced acreage figure and no compensation to the Contractor, as provided in Section 2.11, will be granted even though the reduction may be in excess of 15 percent. If the reduction is in excess of 15 percent, the Contractor may elect not to execute the Contract without penalty.
- 2.10 DELETING ACREAGE** - If insect population levels, because of unforeseen biological or environmental conditions, do not warrant treatment, the Department may delete acreage as stated in the Contract. If this reduction in acreage should exceed 15 percent of the acreage stated in the Contract (not the acreage stated in Section 2.3 and in Section 4 of these contract specifications), the Contractor will be compensated at the rate of 25 percent of the accepted bid price for the acres so deleted in excess of 15 percent and for any associated documented direct costs which are in excess of 25 percent of the accepted bid price. However, in no case will the Contractor be compensated in excess of the accepted bid price for any acreage so deleted.
- 2.11 CANCELLATION** - In the event that the Contract must be cancelled for any reason that is beyond the control of the Department or the Contractor after the execution of the Contract and after the Contractor has made a documented significant financial investment in preparing for the operational phase of the project, the Contractor will be compensated as stated in Section 2.10. Such reasons may include, but are not restricted to, acts of God or of the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but in every case, the failure to perform must be beyond the control and without the fault or negligence of the Contractor.

SECTION 3.AWARDING CONTRACT

3.1 NOTIFICATION OF LOWEST QUALIFIED RESPONSIBLE BIDDER - The lowest qualified responsible bidder to whom the project will be awarded will be identified and notified by the Department within fourteen (14) days after the bid opening. **Bid opening will be Thursday, February 7, 2019.**

3.2 CONDITIONS TO BE MET - In order for the contract to be properly executed and awarded, certain conditions must be met by the Contractor. The following items and information must be completely and accurately supplied to the designated person by the date indicated. Failure to meet this requirement may result in the awarding of the contract to the next lowest qualified responsible bidder.

- **To Contracting Officer by the date indicated in the notification letter to be received by awarded contractors:**
 - A performance bond and a labor and material bond, each in the amount of **60 PERCENT OF THE TOTAL CONTRACT AMOUNT** (see Section 12). Both bonds may be contained in one document if worded correctly. If the Contractor is a corporation, the bonds must be signed by the designated authority in the corporation, or if the Contractor is not a corporation, the owner must sign the bonds. The bonding company must be licensed to conduct business in the Commonwealth of Pennsylvania, and a Commonwealth of Pennsylvania resident agent must countersign the bond. The signers must have their names typed or printed under the signatures. **A letter of credit may be used in place of a surety bond to meet the performance bond requirements only.**
 - Evidence of insurance during the life of the contract in amounts specified (see Section 12). The insurance company must be authorized to conduct business in the Commonwealth of Pennsylvania.
 - Evidence that any out-of-state contractor or subcontractor is registered or has made application to be registered with the Department to do business in the Commonwealth of Pennsylvania (see Section 5.4).
 - Evidence of insurance during the life of the contract in amounts specified (see Section 12) for all subcontractors. The insurance company must be authorized to conduct business in the Commonwealth of Pennsylvania.
- **To Field Operations Supervisor (see Section 1 for name and address) by March 15, 2019:**
 - A completed Application for Spray Aircraft Pilot Approval form for each spray pilot and each alternate spray pilot to be used on the project. This form will be supplied by the Department. Along with the completed form, include photocopies of the pilot's current FAA Airman Certificate (i.e., pilot license), current Airman Medical Certificate, proof of FAR Part 137 qualification (this should include the date of their last Part 137 check), and pesticide applicator certificate.

- A completed Aircraft Description Form for each spray aircraft, alternate spray aircraft, and any observation aircraft to be used on the project. This form will be supplied by the Department. Along with the completed form, include photocopies of the logbook entries for the last annual inspection on engine and airframe, airworthiness directives, and aircraft spec sheets.
- A report on the Contractor's designated personnel and equipment to be used on the project. If a Contractor has been awarded one or more projects, a separate report must be submitted for each project. The same pilots and aircraft may not be submitted for two or more projects. For 2016 there are three projects. The report must be formatted and include all information as follows:
 - Project Number (FPM 19-01)
 - Contractor:
 - Contractor *SAP* Vendor #
 - Name of Contractor
 - Name of President or Owner (specify)
 - Address
 - Telephone Number
 - Contact Person
 - Contact Telephone Number
 - Contact Cell Phone Number
 - Subcontractor(s):
 - Name of Subcontractor
 - Name of President or Owner (specify)
 - Address
 - Telephone Number
 - Contact Person
 - Contact Person Telephone Number
 - Contact Person Cell Phone Number
 - On-Site Project Supervisor:
 - Name
 - Address
 - Office Telephone Number
 - Supervisor Cell Phone Number
 - Spray Pilots:
 - Completed spray pilot approval form (see Attachment 1)**
 - Alternate Spray Pilots:
 - Completed Spray aircraft pilot approval form (see Attachment 1)**
 - Insecticide Formulation:
 - Trade Name
 - Spray Aircraft:
 - OR Completed Spray Aircraft Description Form (see Attachment 2)**
 - Owner

Make/Model
FAA Registration Number
Spray System Make
Tank Capacity (Gallons)
Operating Load Capacity (Gallons)
Calibration Specifics
 Application Air Speed
 Nozzle Type/Size
 Number of Nozzles
Hours on Engine(s)
Hours Remaining on Engine(s)
Inspection Location
Description of Ground-Support Equipment
Make/Model of GPS Unit

- Alternate Spray Aircraft:
OR Completed Spray Aircraft Description Form (see Attachment 2)

Owner
Make/Model
FAA Registration Number
Spray System Make
Tank Capacity (Gallons)
Operating Load Capacity (Gallons)
Calibration Specifics
 Application Air Speed
 Nozzle Type/Size
 Number of Nozzles
Hours on Engine(s)
Hours Remaining on Engine(s)
Inspection Location
Description of Ground-Support Equipment
Make/Model of GPS Unit

3.3 WITHDRAWAL OF AWARD - If the conditions described in Section 3 are not fully and accurately met in a timely manner or if other contract specifications and deadlines specified elsewhere in these Contract Specifications are not fully and accurately met, the contract award may be withdrawn from the lowest bidder and the contract awarded to the second lowest qualified responsible bidder.

SECTION 4. PROJECT SPECIFICATIONS

4.1 PROJECT NUMBER FPM 19-01 (Rotary-Btk)

- (A) Counties Involved: Lackawanna
- (B) Type of Areas to Be Treated: Private residential
- (C) Total Acres: approximately **1,651 acres**

- (C) Number of Spray Blocks: **22 blocks**
- (D) Estimated Starting Date: **May 1-20, 2019**
Depending on weather and larval/foilage development
- (F) Estimated Completion Time: **One (1) week**
- (G) One Required Rotary Aircraft: (see Section 10.3 for aircraft classes)

One Category C+

This Project will require the need for support equipment and ground crew personnel to work simultaneously from multiple loading zones on a daily basis (See Section 11.2).

- (H) Insecticides: *Bacillus thuringiensis* subspecies *kurstaki*
Foray 76B, 38 CLU per acre, undiluted, spray volume of ½ gallon per acre
- (I) Adjuvants: none
- (J) Field Operations Supervisor:
Timothy R. Marasco
Field Operations Supervisor
400 Market St., 6th Floor, PO Box 8552
Harrisburg, PA 17105-8552
Main Office: (717)783-2066
Direct: (717)783-0995
Cell: (717)514-6700
tmarasco@pa.gov
- (K) Loading Zones and/or Airfields: See Section 5.7 and Section 11 for details on deadlines and equipment/personnel requirements.

SECTION 5. OBLIGATIONS OF THE CONTRACTOR

- 5.1 GENERAL** - The Contractor is obligated to furnish spray aircraft, support equipment, and personnel necessary to produce an insecticide application in accordance with the Invitation for Bid, Contract Specifications, and the Contract. Other sections in these Contract Specifications give more specific information on the aircraft, equipment, and personnel required. **The Contractor maintains responsibility for an entire project even if another company is providing part of the equipment and personnel.**
- 5.2 PESTICIDE APPLICATION BUSINESS LICENSE** - Within ten (10) days after notification of award of contract, the Contractor must provide the Field Operations Supervisor (see Section 1 for name and address) with proof of a valid Pesticide Application Business License issued by the Commonwealth of Pennsylvania in the category appropriate for aerial spraying of forests and residential areas.
- 5.3 PROOF OF INSURANCE** - The Contractor must provide proof of insurance as specified in Section 3 and Section 12 for all aircraft and other equipment owned, leased, rented,

subcontracted, or otherwise utilized by the Contractor and for all personnel hired, subcontracted, or otherwise employed by the Contractor.

- 5.4 REGISTERING TO DO BUSINESS IN PENNSYLVANIA**- Out-of-state incorporated contractors and out-of-state incorporated subcontractors must obtain a certificate of authority from the Pennsylvania Department of State before doing business in the Commonwealth, in accordance with Section 103 of the Act of December 21, 1988, (P.L. 1444, No. 177), as amended, known as the Business Corporation Law of 1988, 15 PA C.S.A. 4101 et seq. This section states the manner for procuring a certificate of authority to do business in the Commonwealth and states certain activities the performance of which by an out-of-state business corporation is not considered to be doing business in the Commonwealth for purpose of procuring a certificate of authority. One such excluded activity is "conducting an isolated transaction completed within a period of 30 days and not in the course of a number of repeated transactions of like nature" [15 PA C.S.A. 4122(a)(10)]. Contact the Pennsylvania Department of State, Corporation Bureau, 308 North Office Building, Harrisburg, PA 17120 (717-787-1057) for instructions and the necessary form. A copy of the approved registration must be provided to the contracting officer as specified in Section 3. Contractors must also register via the internet at www.pasupplierportal.state.pa.us.
- 5.5 FAA WAIVER FOR CONGESTED AREAS** - The Contractor is responsible for reviewing all spray block maps and for identifying congested areas that would require an FAA waiver in order to conduct low-level flights over them. The Contractor is responsible for filing the required plan and documentation with the appropriate FAA Flight Safety District Office for congested areas so identified, for obtaining the necessary waiver(s), and for providing proof of such to the Field Operations Supervisor (see Section 1) two weeks prior to the start of the project. Each aircraft must have a copy of the Congested Area Plan for the Project during operations.
- 5.6 SPRAY MATERIALS** - The Contractor is responsible for the purchase of the insecticide and any adjuvant used in this project unless otherwise specified in Section 4. Specific details on insecticides and adjuvants are given in Section 7. The Contractor will not be compensated for any Contractor-supplied insecticide or adjuvant which is lost, spilled, dumped, or otherwise made unavailable.
- 5.7 LOADING ZONES OR AIRFIELDS** - The selection of suitable helispots or airfields for use as loading zones is the sole responsibility of the Contractor. Use of the sites must not present problems from a legal aspect, and permission to use the site must be obtained by the Contractor.
The Contractor must locate and secure permission for all Loading Zones (helispots or airfields) prior to the start of the project and be prepared to provide evidence of such permission to the Field Operations Supervisor. DCNR Bureau of Forestry personnel will assist in locating usable loading zones (LZ) with the Contractor during a visit to the project area no less than one month prior to the start date. The Contractor must notify the Field Operations Supervisor prior to **April 1, 2019**, of the loading zones selected for use. This notification must be in the form of a Geographical Information System (GIS) point shapefile and include data fields containing the LZ location (Latitude / Longitude in decimal degree format), the name, address, and phone number of the landowner or airfield manager. A blank point shapefile will be provided by the Bureau of Forestry to the contractor. In addition, the Contractor(s) must obtain a signed attestation that permission has been granted by the landowner or airfield manager and that the area will be suitable and accessible for use at the

time spraying operations are conducted. Enough suitable landing zones must be secured prior to **April 1, 2019**, so that locating additional or alternative sites is not necessary during the spray application period. **The contractor must follow-up on its contact with the landowner two weeks prior to the anticipated start of operations to ensure that the property is still available for use.** The contractor must supply a GIS point shapefile for all landing zones to the Field Operations Supervisor.

5.8 MAINTENANCE - The Contractor must maintain a readily available on-site inventory of commonly needed spare parts and spare equipment including, but not limited to, pumps, pump seals, and rotary atomizers to maintain the spray system, the aircraft and its electronic guidance and tracking system, the pumping system, the support trucks, and the storage tanks and to provide for immediate replacement of critically needed parts and equipment. Scheduled maintenance must be conducted only at times that will not interfere with the spray operation. Non-scheduled maintenance may be conducted but not to interfere with spray operations for longer than a period of one hour. Only emergency repairs are permitted during scheduled spray hours. Care must be taken to prevent leakage of spray material at all times and a proper spill containment plan must be included in the Contractor's Safety Plan (see Section 5.12).

5.9 SECURITY - The Contractor must abide by any current regulations issued by the FAA with regard to aircraft and insecticide safeguarding and security, as well as any rules and/or recommendations that are issued by state agencies, the Environmental Protection Agency, the USDA Forest Service, the Department of Homeland Security or any other responsible agency. At a minimum, the Contractor must provide the following:

- Chain-of-custody documentation (and/or shipping manifest) from the point of manufacture to delivery to the Contractor for the insecticide utilized.
- All spray aircraft must be disabled when not in use so that they cannot be started by anyone other than authorized personnel.
- All insecticide holding containers, hoppers, mix tanks, pumps, hoses, and similar equipment must be flushed prior to the start of operations and must have all possible points of entry sealed and secured when not in use.
- All spray aircraft and any associated insecticide and insecticide-handling equipment must be attended or guarded at all times, unless located at a restricted access secure airfield or if a waiver for the contract year is issued by the Department. **Contractor will supply security personnel during off duty hours if needed.**
- Access to the insecticide loading and storage areas must be restricted to authorized personnel of the Contractor and the Department.

5.10 FIELD EXPENSES AND TRANSPORTATION - Costs incurred in the operation and maintenance of all contractor equipment are the responsibility of the Contractor. Expenses incurred by all Contractor personnel including arrangements for food, lodging, and transportation are the responsibility of the Contractor. The Contractor is responsible for providing a means of ground transportation for Contractor personnel.

5.11 SPILL CLEANUP EXPENSES - The Contractor is responsible for all cleanup activity and costs resulting from any contamination caused by the accidental or intentional spilling, leakage, or dumping of insecticide, fuel, oil, or any other contaminant from Contractor-supplied equipment.

5.12 SAFETY PLAN - The Contractor is required to conduct all operations in a safe manner and to have a well-defined, written safety plan. The Contractor must provide essential safety equipment including, but not limited to, properly sized and coded fire extinguishers and spill-containment materials and supplies. All Contractor and DCNR Bureau of Forestry personnel must be briefed by the Contractor in their use.

Two (2) weeks prior to the start of the project, the Contractor must supply the Field Operations Supervisor (see Section 1) with a copy of the Contractor's safety plan. This plan must explain how the Contractor will meet the security requirements specified in Section 5.9. The safety plan must also contain a written narrative explaining how the Contractor will deal with a major (100+ gallons) fuel or insecticide spill at the loading zone **and** a major dump of insecticide in a residential spray block.

The Contractor is also required to abide by all provisions of the Department's *Work, Safety and Security Plans*. These documents will be available at the Pre-Bid meeting in January (see Section 1) or can be obtained by contacting the Division of Forest Health (see Section 1).

5.13 ATTENDING PRE-WORK BRIEFING - The Contractor and all subcontractors are required to attend a pre-spray safety briefing as described in Section 6.2.

5.14 ATTENDING POST-SPRAY MEETING - The Contractor is required to attend a post-spray meeting to review the spray program as described in Section 6.4.

SECTION 6. OBLIGATIONS OF THE DEPARTMENT

6.1 DEPARTMENT PERSONNEL - The DCNR Bureau of Forestry will furnish personnel to supervise and direct the aerial and spray operations in the following capacities:

- (A) **PROGRAM SUPERVISOR** - The **Program Services & Support Supervisor** together with the Field Operations Supervisor oversee the overall operation of the suppression program. The Program Services & Support Supervisor is responsible for developing all Air, Safety, and Security Plans, liaison activities with the USDA Forest Service (necessary documentation, reports), and fills many of the "in-office" roles for the program.
- (B) **FIELD OPERATIONS SUPERVISOR** - The **Field Operations Supervisor** functions as the **Air Operations Manager** of the program and is responsible for overseeing and supervising all air and field operations during the program, specifying and approving spray systems, troubleshooting problems with mix and spray systems, monitoring calibration and characterization procedures, analyzing quality control checks, enforcing safety requirements. In addition the Field Operations Supervisor will forward the pilot approval form and the aircraft description form to the Bureau's Aircraft Operations and Safety Specialist for review.
- (C) **FIELD PROJECT COORDINATORS** - These persons are **Forest Health Program Specialists** who serve as the Bureau of Forestry's field liaison with the Contractor Project Supervisor and are responsible for verifying calibration of all spray aircraft prior to and during the spray program, making daily aircraft assignments, verifying acceptable spraying conditions, conducting quality control checks on the aircraft and

application and, when necessary, oversees the corrections made to aircraft spray apparatus or the GPS Tracking and Guidance System by the contractor personnel. In addition, these individuals direct daily assignments of treatment area Monitoring Crews through communication with a Forest District Program Leader and monitor adherence to all safety precautions throughout the project.

- (D) RADIO TECHNICIAN - This person is responsible for checking the Contractor's compliance with contract-specified radio-related equipment, installing Bureau of Forestry radio units in the spray aircraft if needed, and evaluating the performance of those units.
- (E) AIRCRAFT DISPATCHER - This person is responsible for directing the operation of one or more aircraft from a loading zone. He/she briefs the pilot on the spray block manifest and on any special conditions such as objector locations. The aircraft dispatcher coordinates the movement of treatment area Monitoring Crews and acts as record keeper. In addition, these individuals are responsible for monitoring the mixing and loading of the insecticides, maintain records for the amount of chemical mixed, aircraft loaded (kind and identification number), time of aircraft take-off, time of aircraft return, and the block number(s) treated. The mixing and loading records will be submitted at the end of each treatment day to the Field Operations Supervisor. Mixing and loading will be done at one location for each operations site. He/she also provides daily reports of the operation to the Field Project Coordinator and the Field Operations Supervisor.
- (F) DISTRICT PROJECT LEADER (DPL) / DISTRICT FOREST HEALTH COORDINATOR - These individuals serve as the crew leaders for Monitoring Crews within specified Forest Districts or pre-determined counties. Their primary responsibility is to assign Monitoring Crews to scheduled treatment areas for a given day or spray session and to ensure those Monitoring Crews have the appropriate equipment and documentation to record weather readings and spray deposition. DPL's are responsible to ensure the requested number of Monitoring Crews are available for all spray sessions that are determined by the Field Project Coordinator or his/her designee.
- (G) MONITORING CREW - A monitoring crew consists of one or two persons equipped with a radio capable of communicating with the Aircraft Dispatcher and the spray aircraft pilot. The number of crews assigned to an aircraft is dependent upon the size of the aircraft and the scope of the project. These personnel serve as roving crews during spray operations and are responsible for monitoring and recording spray weather as well as collecting larval and foliage development information in assigned treatment areas. In addition, these crews serve a critical role to advise the spray pilot of changing conditions in the treatment area and to notify the pilot of increased public activity including, but not limited to, school children assembling for bus pickup and the presence of Unmanned Aerial System (UAS) aircraft.
- (H) DGPS GUIDANCE SYSTEM OFFICER - These persons are DCNR Bureau of Forestry specialists who serve as field liaisons with the Contractor and are responsible for organizing and reviewing digital post-treatment files from the treatment aircraft. Following treatment file review, these individuals may provide input to the Field Project

Coordinator for possible adjustments in order to improve insecticide coverage to the treatment area.

- (I) **SAFETY OFFICER** - The Safety Officer will assist the Contractors' Project Supervisors, Field Operations Supervisor, Field Project Coordinators, and the Program Supervisor regarding safety provisions in the spray contract; and also make sure that the contractor and the state personnel are following all pertinent aviation and ground personnel safety guidelines. They investigate any misuse or misapplication of an insecticide, aircraft incidents or accidents, or any insecticide spill. The Safety Officer will conduct or assist in conducting safety briefings throughout the program.

6.2 PRE-WORK BRIEFING - The Division of Forest Health will conduct a pre-work briefing for all Contractors by April 1 of the current project year. All Contractors will be required to present their report on personnel and equipment as detailed in Section 3. The briefing will include the Project Supervisor, the Contractors' and subcontractors' representatives, the Field Operations Supervisor, the Program Supervisor, the Safety Officer, Field Project Coordinators, and any other invited persons to discuss, among other things, contract specifications, project deadlines, and program safety and security. **Participation at this meeting is required for all Contractors and subcontractors working on the project.**

6.3 PRE-SPRAY MEETING - At a time, date and location agreeable to all parties, no later than two days prior to the scheduled start of aerial operations, representatives of the Field Operations Supervisor and Contractor(s) shall meet and discuss the aerial operations and application program. Topics for discussion shall include, but are not limited to, logistics for aerial application and observation aircraft (if needed); assigning treatment blocks to application aircraft; assigning observation aircraft to application aircraft (if needed); the handling, mixing and application of the insecticides; aircraft capabilities; final selection of loading zones, safety precautions, etc. The Contractor(s) shall require all pilots that will be used on this project to attend the pre-spray meeting.

6.4 POST-SPRAY MEETING - At a date, time, and location agreeable to all parties, no later than two weeks after the last day of spraying, representatives of the DCNR Bureau of Forestry and Contractor(s) shall meet and review the aerial operations and application program.

6.5 EVALUATION AND PLANNING - Pilots are required to attend evaluation and planning meetings following each treatment session to review and evaluate the previous treatments. Planning of the next treatment session will also be discussed.

6.6 MAPS - The Division of Forest Health will supply hard copy maps, intended for spray pilot pre-treatment planning and reference. These maps will show treatment area boundaries and, if applicable, any associated exclusion area(s). All application pilots are responsible and required for the reconnaissance of each assigned treatment area before beginning treatment to determine the presence of aerial hazards (Section 8.5).

6.7 GIS FILES - Treatment area information, including exclusion areas, will be provided to the contractor by DCNR, utilizing ArcView/ArcInfo Geographical Information System (GIS). The GIS shape files will be transferred to the contractor in order to translate the data, if necessary, into the applicable data format required by the spray aircraft GPS electronic tracking and guidance system.

- 6.8 DAILY AIRCRAFT RECORD (DAR)** - The Division of Forest Health will keep, as the basis for Contractor payment, an accurate record of the insecticide metered into the aircraft and the acreage treated. A copy of the Daily Aircraft Record, signed by the Bureau of Forestry assigned Aircraft Dispatcher and the spray pilot, will be provided to the Contractor. The Contractor will not be paid for any insecticide that is applied in unauthorized areas or is jettisoned accidentally or in emergencies. The pilot's signature indicates agreement with the data on the form. Payment will be based upon agreed acreage treated.
- 6.9 WAIVERS FOR SPECIAL USE AIRSPACE (RESTRICTED AND PROHIBITED AREAS)** - The Contractor will obtain the necessary waivers from the FAA for flights into restricted and or prohibited airspace. A copy of each approved waiver must be provided to the **Field Project Coordinator and the Field Operations Supervisor** prior to the first flight into the restricted or prohibited area.
- 6.10 THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT** – The Department will be responsible for obtaining all necessary permits from the Pennsylvania Department of Environmental Protection and for submitting annual reports.

SECTION 7. INSECTICIDES AND ADJUVANTS

- 7.1 PURCHASING, STORAGE, AND TRANSPORTATION** - The Contractor must purchase the insecticide used on this project, pay all applicable sales and use taxes, and arrange for delivery of the product to a suitable site where it will be secure and protected from damage. The Contractor must assure that adequate supplies of insecticide are strategically located in or near the project area at least 24 hours prior to the start of spraying in order to assure an efficient operation. The Contractor must also assure that appropriate Department personnel are aware of these locations.

The Contractor is also responsible for handling and transporting the insecticide from the storage site to the aircraft-loading zone and for providing security of the insecticide.

- 7.2 ADDITIONAL ACREAGE** - The Contract will contain figures for the maximum number of acres to be treated—no additional acreage will be included. However, if any additional spraying is required to permit the retreatment of any treated area as the result of rain wash-off, skips, or other reasons, a contract amendment may be established to a maximum of 10 percent of the original contract acreage. Because of the contingent nature of utilizing the insecticide necessary for treating this additional acreage, the Contractor does not have to purchase and have on-site the insecticide necessary for treatment. However, the Contractor must make arrangements so that the insecticide required to treat additional acreage can be made available on site within 48 hours.
- 7.3 LABELS AND SAFETY DATA SHEET (SDS)** - The Contractor must keep a copy of the labels and SDS available on site throughout the course of the project.
- 7.4 INSECTICIDES** - All spraying will be conducted with ***Bacillus thuringiensis subspecies kurstaki (Btk)***. Acceptable formulations for *Btk* are identified below. Section 4 provides area and treatment details.

7.5 ACCEPTABLE BTK FORMULATIONS - All *Btk* will be applied as specified and at the rates provided in Section 4. The following *Btk* formulations are labeled and acceptable for forestry applications on this contract:

FORAY 76B

(A) NOTES ON BTK PRODUCTS - To avoid confusion and to simplify logistics, all *Btk* used for treatments in the project must be from the same manufacturer. All *Btk* products used in the Department's program must be new material manufactured within six months of date of application.

(B) BTK PURCHASING - For information on purchasing *Btk* products, contact the following:

(1) FORAY 76B Products

Stephen Nicholson
Forestry Sales Manager
Valent BioSciences
870 Technology Way, Suite 100
Libertyville, IL 60048
Phone/Fax: (613)376-1070
Cell: (613)539-1977
stephen.nicholson@valent.com

7.6 CONTAINER DISPOSAL - The Contractor is responsible for the proper disposal of all empty insecticide and adjuvant containers according to label requirements, State laws and regulations.

7.7 APPLICATIONS/RATES/SPRAY VOLUME - Specifics on the number of applications and application rates are given in Section 4.

7.8 OPERATIONS - All operations will conform to Federal Aviation Administration (FAA) requirements, manufacturer's pesticide label instructions, Department of Transportation (DOT) policies and the appropriate state requirements for storage, transportation, loading and application of insecticides.

SECTION 8. APPLICATION SPECIFICATIONS, CONDITIONS, AND RESTRICTIONS

8.1 SAFETY - Department and Contractor personnel are required to conduct themselves in a safe manner at all times. The Department and Contractor will prepare detailed safety plans that will be reviewed with all involved Department and Contractor personnel prior to the start of the spraying operations.

Caution must be exercised during spraying because of the frequent flight operations directly over residential areas. Some of the terrain may be mountainous and irregular, and elevations up to 2,900 feet above mean sea level may be encountered.

8.2 LOGISTICS - Once on site and under contract to the Department, each aircraft and its assigned pilot, ground-support equipment, and crew are under the logistical direction of the Program Supervisor. Although an effort will be made to distribute the workload equitably among all the aircraft assigned, such a distribution is not guaranteed.

8.3 WEATHER RESTRICTIONS - Using the following guidelines, the Department will determine when weather conditions are acceptable for spraying operations to be conducted. Information supplied by the Department's field personnel located in or near the treatment area and the Contractor's pilot will be used in making this decision.

- (A) **WIND VELOCITY** - Wind velocity should be 10 mph or less when measured in or near the spray block with a hand-held wind gauge. If excessive drifting of the spray cloud occurs, the current spray operations may be suspended by the Project Coordinator. Caution must also be exercised when dead calm conditions exist because of the formation of temperature-inversion layers. Under such conditions, the smaller droplets in the spray cloud will remain suspended and will not settle into the forest canopy. Spray operations must be curtailed until such conditions subside.
- (B) **PROBABILITY OF PRECIPITATION** - Probability of precipitation within six hours after the completion of spraying must be 50 percent or less. This probability of precipitation is provided by Flight Service Weather (1-800-992-7433), National Weather Service (use closest local source), or other contracted weather forecasting source. Any treatment area that incurs significant precipitation (0.25 inch or more) within four hours of spraying must be evaluated and, if necessary, resprayed at the Department's expense. Consult with the insecticide manufacturer regarding appropriate spray deposit drying time.
- (C) **AIR TEMPERATURE AND RELATIVE HUMIDITY** – when temperatures and relative humidity conditions are such that proper insecticide application may be hindered. Generally, applications will be halted when temperature exceeds 75 degrees Fahrenheit and/or relative humidity falls below 50%. When applying Foray products, please refer to the temperature and humidity chart provided by Valent BioSciences.
- (D) **WET FOLIAGE** - Foliage must not be dripping wet either from precipitation or overnight dew.

8.4 ACCURACY - The Contractor must produce a complete and accurate coverage of the designated areas within the spray block as documented by GPS tracking and guidance flight logs. If any designated area is missed or improperly treated, it must be resprayed at the Contractor's expense.

Care must be exercised in ensuring that all insecticides are deposited within the designated block boundaries and away from areas indicated as sensitive and/or where property owners object to the spraying. Within the designated block boundaries, the spray is to be applied to forested areas only and must be shut off over all open bodies of water.

The Department will create associated exclusion areas for treatment areas that contain open water or designated non-forested areas based on department criteria. All areas within the treatment area boundary must be sprayed unless bounded by an exclusion area. Exclusion

areas will be incorporated into the GIS based digital treatment file that is delivered to the contractor.

Many treatment areas are residential. The most densely populated areas in the residential treatment block must be treated as early as possible when most people are indoors. Congregations of people, including children waiting for school buses, must be avoided at all times.

8.5 RECONNAISSANCE - The Department requires a reconnaissance flight by the spray pilot over each spray block prior to treatment to ascertain the block layout and to identify and avoid any flight hazards or congregations of people. If the spray pilot has difficulty in conducting adequate reconnaissance flights and/or in orienting with the spray blocks, the Contractor is required to supply an observation aircraft (Section 10.2) with pilot. **Pilots are responsible for communication and must conduct operations under the FARs with the appropriate air traffic control agency for the type of air space overlying treatment areas.**

8.6 FERRY FLIGHTS - Ferry flights to and from the work sites or between loading zones in the project area are to be provided by the Contractor and will not be billed to the Department. This airtime must be limited to flights that are essential; ferry flights must be avoided over sensitive areas, and in or near objector locations.

8.7 SPRAY TIME POLICY - Because of the short spray window available, it is essential that advantage be taken of any acceptable spray weather within the limits imposed by insect development, pilot work-hour limits [Section 9.3(J)], certain time-of-spray restrictions (Section 8.8), and safety considerations. Therefore, spraying may take place whenever weather conditions permit, including weekends and holidays.

Morning spray session take-off is scheduled for 30 minutes before legal daylight, i.e. sunrise.

8.8 TIME-OF-SPRAY RESTRICTIONS - Spraying must be curtailed at certain times in certain situations to avoid potential conflicts with land users.

- Spraying is not permitted in state, federal, or other parks and/or campgrounds from noon on Friday through Sunday or from noon the day preceding a holiday through the holiday unless special arrangements have been made with the park manager. These special arrangements must include a written waiver signed by the park manager attesting that persons utilizing that area are not being exposed to insecticide treatment against their will or without their knowledge.
- Evening spraying (1 p.m. until dusk) on Saturday, Sunday, or a holiday must be restricted to State Forest land or other land ownerships where potential land user conflicts would be minimal.
- No spraying may be conducted over school buses while they are actively picking up or discharging students or over any group of schoolchildren or other persons congregated within the spray block.

8.9 EVENING SPRAYING - The primary productive spray time is in the early morning. However, evening spraying is available and permitted when the weather report is favorable and where a few hours would be helpful in keeping on schedule. Evening spraying is the biggest single factor that leads to fatigue for everyone working on the program. For these

reasons, evening operations should not be automatically included in the daily spray schedule. Evening spraying shall be considered only when it is essential to finish up the spray project in an area.

If evening spray operations are conducted, they may be curtailed when the Department determines that fatigue is excessive.

- 8.10 AIRSPEED** - An exact application airspeed will be designated by the pilot at the time of calibration verification.
- 8.11 APPLICATION ALTITUDE** - Spray application shall be released 50-100 feet above the canopy of the target, except where obstruction in or adjacent to the target would endanger the safety of the pilot while applying pesticides at that altitude. Spray pilots must spray between 50-100 feet above tree canopy.
- 8.12 TURNS** - The aircraft spray boom must be shut off at the end of spray runs and during turns. Turns must be avoided over sensitive areas, including properties where the owners have objected to spraying.

SECTION 9. CONTRACTOR PERSONNEL

- 9.1 PROJECT SUPERVISOR** - The Contractor must designate one of its personnel to serve as the on-site project supervisor and to represent the company in all contractual matters that require prompt attention. This person must be familiar with all equipment being used and, as necessary, must be certified or registered as required by the Commonwealth of Pennsylvania Pesticide Control Act and rules and regulations of the Department. If the project involves the use of no more than one loading zone at any given time, a spray pilot, observation pilot, or ground-support person may serve as the project supervisor. If the project involves the simultaneous use of two or more loading zones, the project supervisor must not be assigned to regularly fly an aircraft or serve as ground support for any aircraft. The project supervisor may, if qualified, be used as an alternate spray pilot if the regular pilot is debilitated or otherwise unavailable.
- 9.2 GROUND-SUPPORT PERSONNEL** - The Contractor must supply sufficient numbers of properly trained and qualified ground-support personnel to drive all necessary support vehicles, handle insecticides, operate and maintain the equipment used to transfer insecticides, and properly fuel, service, and maintain each aircraft. All ground-support personnel must be familiar with the aircraft's spray system and knowledgeable of calibration techniques. All personnel provided by the Contractor must be experienced and fully trained in their duties and be fully proficient in English. All ground personnel involved with the handling of insecticide must be supervised, certified, or registered as required by the Department.

All ground-support personnel must be equipped and trained to take proper action in an emergency. These people must observe all safety precautions in handling the insecticides and in refueling the aircraft. The Contractor is required to replace any ground-support person who, in the opinion of the Department does not demonstrate the knowledge and capability to perform his/her duties.

9.3 PILOTS

- (A) FAA QUALIFICATIONS - The Contractor must provide pilots that are FAA qualified to operate the aircraft specified in the bid. Each spray pilot, whether in a primary or backup role, must be qualified under FAR Part 137 and must provide written evidence to the Program Supervisor.
- (B) PILOT LIST - The Contractor must provide the Field Operations Supervisor with a list of all pilots including alternate spray pilots slated for use on the project as designated in Section 3.2. Each spray pilot slated for use on the project, whether in a primary or backup role, must complete an Application for Spray Aircraft Pilot Approval Form supplied to the Contractor by the Bureau of Forestry and return it for review by **March 15** as designated in Section 3.2. The form will be reviewed and approved/disapproved by the bureau's Aircraft Operations and Safety Specialist.
- (C) PESTICIDE APPLICATOR CERTIFICATION - Each spray pilot must be certified in the appropriate category by the Department for the type of spraying being done. In the event any pilot does not hold a current applicator license issued by the Pennsylvania Department of Agriculture, it must be obtained within 10 days after notification of award of contract.
- (D) DGPS - Each pilot must demonstrate proficiency in the operation of the aircraft's DGPS guidance system (See Section 10.6.1 d).
- (E) EXPERIENCE - Each spray pilot must meet or exceed the following experience minimums as pilot in command:
 - All aircraft..... 2,000 hours
 - Aerial Application/Agriculture flight time 1,000 hours
 - Night flying 100 hours
 - Cross Country 500 hours
 - Type (rotary/fixed) to be flown in project 200 hours
 - Category and Class to be flown on project..... 200 hours
 - Make, model, and series to be flown on project 50 hours
 - Forest pesticide application in terrain typical of project area 100 hours
- (F) CONTROLLED SUBSTANCE USE - Any pilot observed by the Department using or in possession of any nonprescription, controlled substance such as, but not limited to, marijuana, hashish, cocaine, heroin, and/or amphetamines shall be immediately dismissed from the project. Such findings will be reported to the appropriate law enforcement agency and the FAA for action.
- (G) ALCOHOL CONSUMPTION - A pilot may not consume alcohol or a nonprescription medication containing alcohol within 8 hours of scheduled flight time. Any pilot

observed by the Department consuming alcohol or exhibiting symptoms of alcohol intoxication or impairment or any other intoxication or impairment will not be authorized for flight for 24 hours. A second occurrence will result in dismissal from the project.

- (H) THE DEPARTMENT'S RIGHT TO REJECT - The Department reserves the right to reject the Contractor's use of any pilot who, in the Department's opinion, has performed unsatisfactory in previous operations whether in the Commonwealth of Pennsylvania or elsewhere. The Department reserves the right to permanently reject any pilot who, in the Department's opinion, violates these Contract Specifications, is unsafe, or otherwise performs unsatisfactorily.
- (I) PILOT RESPONSIBILITY - The spray pilot is responsible for the accurate and proper application of the insecticide spray to the designated site using good application delivery procedures as generally recognized as correct by professionals in the aerial application industry.

The pilot is responsible for being able to proficiently operate all of the aircraft's electronic equipment including, but not limited to, radios, GPS guidance system. The pilot is responsible at all times for the safe operation of the aircraft. The Department will not require flying in fog, dense smoke, or under any other adverse conditions which a prudent pilot would avoid nor is the pilot required to operate from any site which the pilot considers unsafe.

The pilot is responsible for the identification and avoidance of all flight hazards in route to, from, and within the operation area. **The pilot must make a reconnaissance flight over each spray block to identify and locate any such hazards or congregations of people prior to treating the block.** The pilot must avoid spraying any congregation of people, including children waiting for school buses. The pilot is responsible for communicating with all appropriate air traffic control facilities within the area of operation.

The pilot is responsible for maintaining radio communication with the Department aircraft dispatcher. The pilot must contact, via radio, the aircraft dispatcher when the pilot begins spraying a block, when a block is finished, and when a spray load is finished. Failure to maintain proper radio communications may result in the removal of the pilot from spray operations. In situations when the distance of a treatment area from the loading zone inhibits the ability for the pilot to communicate with the program supervisor, the pilot may communicate via radio with assigned Department block monitors, if applicable.

- (J) DUTY LIMITATIONS

Assigned duty of any kind must not exceed 14 hours in any 24-hour period. "Duty" includes flight time, ground duty of any kind, and standby. Local travel up to a maximum of 30 minutes each way between the worksite and place of lodging will not be considered duty time. Pilots will be subject to the following duty hour limitations:

- A maximum of 14 consecutive duty hours during any assigned duty period
- The pilot must be given 2 calendar days of rest (off duty) within any 14 consecutive calendar days.

- The pilot must be given a minimum of 10 consecutive hours of rest (off duty) prior to any assigned duty period.
- The above limits notwithstanding, pilots are expected to notify the program supervisor if they become fatigued prior to reaching the duty day limit.

The Field Operations Supervisor or representative may waive the "consecutive" 10 hour rest period (off duty) limitation, in this section, to provide pilots two nonconsecutive off-duty rest periods, provided the accumulated rest periods equal no less than 12 hours of off duty time in any 24-hour period. One of the rest periods must include at least 8 hours of uninterrupted rest. This waiver may not be granted more than three times in any 14-duty-day cycle.

(K) FLIGHT LIMITATIONS

Each pilot must report all flight time, regardless of how or where performed, except personal pleasure flying. All pilots reporting for duty may be required to submit a record of all duty and/or flight time during the previous 14 days. This record will be used to administer flight and duty time limitations.

Flight time to and from a duty station as a pilot (commuting) will be reported and counted toward limitations. Flight time includes but is not limited to military flight time, charter, flight instruction, 14 CFR Part 61.56 flight review, flight examination by FAA designees, any flight time for which a pilot is compensated, or any other flight time of a commercial nature whether compensated or not.

Pilots will be limited to the following flight hour limitations, which must fall within their duty hour limitations:

- A maximum of 8 hours flight time during any assigned duty period. Pilot flight hour computations shall begin at lift off and end at touchdown.
- A maximum of 42 hours flight time during any consecutive 6 day period. When a pilot acquires 36 or more flight hours in a consecutive 6 day period, the pilot will be given the following 1 calendar day off duty for rest, after which a new 6 day cycle will begin.

Flights point-to-point (airport to airport, etc.) with a pilot and co-pilot shall be limited to 10-flight hours per day. (An aircraft that departs from "Airport A", and flies reconnaissance on a treatment block and then flies to "Airport B" is not point-to-point).

The Contractor must monitor and remove any personnel for fatigue or other causes before they reach their daily duty or flight limitations

When pilots act as a mechanic, mechanic duties in excess of 2-hours will apply as flight hours on a one-to-one basis toward flight hour limitations.

Relief, additional, or substitute pilots reporting for duty under this Contract shall furnish a record of all duty and all flight hours during the previous 14-days.

(L) SPRAY PILOT PROTECTIVE GEAR - All spray pilots must wear the following Contractor-provided protective gear:

- Nomex flight suit
- Nomex gloves
- FAA-approved helmet with headset and microphone assembly
- Eight-inch high leather boots

9.4 OBSERVATION AIRCRAFT PILOT/NAVIGATOR - If determined by the Department, the Contractor must supply an FAA-qualified pilot to fly any required observation aircraft (see Section 8.5 and Section 10.2) for assisting spray pilots as specified in Section 8.5 and Section 8.6. If the observation aircraft pilot is not proficient in DGPS operation, is not able to read and navigate from USGS 7.5-minute quadrangle topographic maps, aerial photos, or other images used, or is inexperienced in providing reconnaissance or orientation, then the Contractor must provide an additional person who is so qualified to serve as navigator in the observation aircraft. The observation aircraft pilot and, if needed, navigator must aeri ally preview in detail any and all spray blocks scheduled for treatment so that they will be prepared on the day of spraying to readily assist the spray aircraft pilot with reconnaissance, orientation.

SECTION 10. AIRCRAFT

10.1 GENERAL SPECIFICATIONS AND OPERATIONAL LIMITATIONS

- (A) AIRCRAFT DESCRIPTION - The Contractor must complete and submit to the Program Supervisor an Aircraft Description Form for each spray aircraft, alternate spray aircraft, and auxiliary aircraft slated for use on the contract by **March 15** of the current project year as specified in Section 3.2.
- (B) AIRCRAFT SUBSTITUTION - The Contractor is permitted to substitute designated aircraft with aircraft in the same or larger category three (3) weeks prior to the start of a project with the Department's approval provided all applicable specifications and insurance requirements for the substituted aircraft are met at the time of substitution.
- (C) LICENSES - Every aircraft furnished for this contract must be properly licensed and airworthy under regulations of the Federal Aviation Regulations for commercial operations. Aircraft must be maintained in accordance with 14 CFR Part 137.31.
- (D) CONDITION - Each aircraft must be clean inside and outside and must fully comply with FAA directives and specifications and to any pertinent laws and regulations of the Commonwealth of Pennsylvania.
- (E) SAFETY - Safety regulations prescribed by the FAA, the manufacturer of the aircraft, the Contractor, and the Department must be observed at all times. All Contractor-supplied aircraft must contain FAA-approved shoulder harnesses and lap belts for the pilot and front crew/passenger and lap belts for all rear seats.

- (F) EQUIPMENT - All equipment specified in these Contract Specifications for use in or upon any aircraft must be FAA approved or the Contractor must have an FAA field approval (FAA Form 337) from the FAA Flight Safety District Office serving the Contractor's home base of operations.
- (G) ADDITIONAL EQUIPMENT REQUIREMENTS
- Fire Extinguisher(s). As required by 14 CFR 137, fire extinguisher supplied shall be a hand-held bottle with a minimum 2-B:C rating, mounted and accessible to the flight crew. The Contractor is responsible for ensuring all company personnel are trained in the correct use of these fire extinguishers
 - A flight meter or recording tachometer displaying actual flight time in hours and tenths.
 - A variety of avionics (See Section 10.5)
 - First aid kit
 - DGPS navigation system (See Section 10.6)
 - Automated flight following equipment (See Section 10.7 and Attachment 3)
 - Aircraft Spray System (See Section 10.4)
- (H) MAINTENANCE - Aircraft shall be operated and maintained in accordance with 14 CFR requirements and manufacturers' recommendations. Compliance with mandatory manufacturers' bulletins, FAA ADs, and the correction of maintenance deficiencies shall be accomplished prior to the start and during the period of Contract performance.
- (I) INSPECTION - Department personnel or Department contracted personnel will inspect the Contractor's aircraft to determine if they meet the Contract Specifications. Performance tests, as necessary, will be conducted at a location mutually agreed upon by Department personnel and the Contractor. The Contractor must assume all expenses incident to operation of the aircraft and the pilot's time during these tests. The Department may request this inspection be held as many as sixty (60) days prior to the scheduled start of spraying. On-site inspection on the reporting date may be acceptable if approved in advance by the Department.
- (J) EXCLUSIVE ASSIGNMENT TO THE DEPARTMENT - Once an aircraft and its assigned pilot, ground-support equipment, and support crew report on site and are under contract to the Department, no substitutions may be made unless the aircraft, equipment, or person becomes incapacitated.

While an aircraft is under contract to the Department the aircraft and its assigned pilot, ground-support equipment, and crew are not permitted to do any other spraying for any other agency, business, or individual. If a delay caused by a lack of insect and/or foliage development of two or more days in the spraying operation is anticipated as determined by the Department the Contractor may be issued a written temporary release by the Program Supervisor for any or all aircraft, personnel, or support equipment provided that the Contractor will return on site at the time and date specified with all aircraft, personnel, and support equipment and with the aircraft configured and calibrated according to original specifications and with all spray systems and support equipment properly cleaned. Upon completion of their work on this contract, aircraft will be released by written consent of the Program Supervisor and with verbal confirmation by the Program Supervisor.

- (K) AIRCRAFT REPAIRS - In the event that any aircraft under contract becomes non-airworthy, it must be repaired within 24 hours of the original breakdown. If the aircraft cannot be repaired and returned safely to full operation, it must be replaced with an aircraft of similar capabilities subject to all of the provisions of these Contract Specifications within 48 hours.
- (L) ENGINES - Each aircraft engine must meet manufacturer's specifications for airworthiness. Engine and airframe logs must be present at time of inspection.
- (M) AIRCRAFT REFUELING - Any refueling of the aircraft done while the engine is running and/or the rotor spinning must be done by hose line and nozzle only. Fueling from containers will be permitted only during complete engine shutdown. Proper aircraft/fuel truck bonding procedures as approved by the National Fire Protection Association must be followed while refueling.
- (N) RESERVE FUEL - A minimum 30-minute reserve fuel supply over the amount needed for the planned round trip is required for each flight.
- (O) LOADING - The pilot is responsible for the proper loading of the aircraft. Loading is under the pilot's direction and must be inspected by the pilot before takeoff. The weight must not exceed the maximum gross weight specified by the aircraft manufacturer. The pilot must compensate for altitude, temperature, landing zone conditions, and any adverse flying conditions.
- (P) VISIBILITY - The aircraft windshield or bubble must be kept clean prior to and during spray operations.

10.2 OBSERVATION AIRCRAFT *(If required by the DCNR Bureau of Forestry)* - As specified in Section 8.5 and Section 9.4, the Contractor may have to supply one high-wing, fixed-wing aircraft (no less than an 180-185 hp), pilot, and, if necessary, navigator (see Section 9.4) for every one to two spray aircraft provided (i.e., 1:1, 1:2, 2:3, 2:4, 3:5, etc.). The Contractor will use this aircraft, as needed, to provide reconnaissance and navigational assistance to the spray pilot. As specified in Section 9.4, the observation aircraft and its associated crew must be on site in time for the crew to aerially preview all spray blocks scheduled for treatment.

If the Contractor wishes to provide additional observation aircraft for any purpose, it may do so at no separate additional cost to the Department.

10.3 AIRCRAFT CATEGORIES - The specific numbers of aircraft needed for each project are given in Section 4 using the spray aircraft category designations A through D. Aircraft in a larger-size category as listed in Section 10.3(A) and Section 10.3(B) may be substituted with the written approval of the Department. Specifics on the aircraft slated for the contract must be provided to the Department as indicated in Section 3.2 in order for the Contract to be awarded. Because of logistical planning by the Department, the Contractor is not permitted to substitute aircraft less than three (3) weeks prior to the start of the project [see Section 10.1(B)].

The following tables list examples of acceptable aircraft for each category along with maximum allowable lane separations for the required nozzle systems (smaller lane separations may be used to increase deposition). The actual lane separation for the specific aircraft to be used on the project will be assigned at the time of calibration verification based

upon the best available information [Section 10.4(C)]. Aircraft not listed may be considered if they are of similar capability to those listed in that category and if the request to use them is approved by the Department prior to bid opening.

(A) HELICOPTERS

CATEGORY	EXAMPLES OF ACCEPTABLE AIRCRAFT	MAXIMUM LANE SEPARATION (FEET) ROTARY ATOMIZERS
A	Bell 204 Bell 205 Bell 212 Bell 214	150 150 150 150
C+	Bell OH58 Bell 206L	125 125
C	Bell 206B Bell/Soloy 47G-3B Hughes 500D Hiller UH-12	100 125 75 125
D+	Hiller/Soloy 12E	100
D	Bell 47G Hiller 12E	100 100

10.4 AIRCRAFT SPRAY SYSTEM

(A) GENERAL SPECIFICATIONS

- (1) TANKS – Leak-proof, corrosion-resistant tanks with exterior filler openings must be used. The location and size of tanks must be so as to not impair airworthiness by overloading or displacing the center of gravity beyond acceptable limits. Filler openings or necks must be large enough to prevent surging during filling. Tanks must be vented to the outside of the fuselage.
- (2) EMERGENCY DUMP SYSTEM - Each aircraft must be equipped with an emergency jettisonable load-dumping system or emergency non-leaking dump valves of adequate capacity and adequately vented to dump the load and installed so as to prevent blowback into the fuselage. In no case must the ratio between gallons carried and the surface area of the dump-valve opening as measured in square inches be greater than 7.65 to 1. Exposed valve-control linkage must be protected to prevent unintentional opening of the valve in any manner. The control lever must be substantially mounted in the cockpit within easy reach of the pilot when properly wearing the shoulder harness.
- (3) PUMPING SYSTEM - The pumping system must be securely attached and capable of maintaining the pressure required to insure the even distribution of the insecticide. All plumbing and pumps must be large enough to handle the

required flow. All parts, including pump seals, must be chemically and abrasively resistant to the spray material being used.

- (4) PRESSURE GAUGE - An accurate liquid-filled spray pressure gauge must be located so that the pilot can easily read it.
- (5) SHUTOFF - To avoid contamination of areas not scheduled for treatment, the entire spray system must be leak-proof and have a positive shutoff mechanism capable of eliminating dripping from the nozzles when shut off.
- (6) SYSTEM CLEANING - The aircraft spray system, including tanks, must be cleaned of all foreign material and flushed with water prior to the start of the spray operation. The spray system must be flushed following spraying on a daily basis to prevent drying of spray material from becoming a problem. The Contractor must daily clean all screens, check for leaks and clogs, verify pump pressure, and monitor flow rate.

During the spray project the spray system must be flushed with water if a switch between insecticides is made.

- (7) STRAINER - Each aircraft must be equipped with an in-line strainer (no finer than 30 mesh) to filter all material before it enters the spray boom.
- (8) SPRAY TIMER - Each aircraft must be equipped with an electronic flow-metering system, such as a CropHawk®, that is activated automatically when the spray switch is operated.

The system must be capable of providing an accurate measurement of the cumulative spray time in minutes and tenths or minutes and seconds as well as an accurate measurement of the volume of spray material dispensed.

- (9) BOOM SYSTEM - Each aircraft must be equipped with an FAA-approved boom system of the type most commonly employed for the delivery system being used. This system must have:
 - (a) Nozzles located so as to minimize the spraying of insecticide onto any part of the ship's structure.
 - (b) All nozzles rigidly attached to the boom without flexible dropper hoses.
 - (c) Bleeder lines installed at the ends of the boom feeding back to the outboard nozzle if that nozzle is installed more than five inches from the boom end.
- (10) PUMP PRESSURE - The pump must have an effective operating pressure range of 20-50 PSI.
- (11) AUTOMATIC ON/OFF OF SPRAY BOOM – The aircraft spray system must be equipped with an automatic on/off of spray boom that is controlled by the aircraft's GPS guidance system. The ability to manually over-ride the automatic on/off system must be available.

- (12) **AUTOMATIC FLOW CONTROL** – The aircraft spray system must be equipped with automatic flow control that is controlled by the aircraft's GPS guidance system.
- (B) **NOZZLES** - Approved rotary atomizers (4-8 units per aircraft) are required for spray aircraft flying at an application airspeed of 140 mph or less. Either rotary atomizers or hydraulic nozzles are permitted on spray aircraft flying at an application airspeed of 141 mph or more. The nozzle systems must meet the following specifications.
- (1) **HYDRAULIC**
- (a) **TYPE** - Nozzles must be of either the flat-fan or hollow-cone type. All nozzles on any aircraft must be of the same type.
 - (b) **SIZE** - Tips of the proper sizes to produce an acceptable flow rate and a droplet volume median diameter (VMD) of 80-100 microns for Foray 76B applications, a VMD of 200 microns for Gypchek, and a VMD of 100-125 microns for Mimic 2LV application must be provided. A check with the manufacturer for the latest recommendations should be conducted annually. All nozzle tips being utilized on an aircraft at any given time must be the same size. Tip size must be approved by the Department's monitoring specialist prior to reporting on site for calibration verification.
 - (c) **MATERIAL** - Only new nozzle tips are permitted.
 - (d) **ANGLE** - Nozzles must be properly positioned relative to the line of flight in order to take advantage of wind speed to assist in breakup and dispersion of droplets.
 - (e) **NOZZLE SCREENS** - Each nozzle must be equipped with a 30-mesh wire screen or slotted strainer. It is possible that the screen or strainer will be removed during the spray operation, but it must be available in case needed.
- (2) **ROTARY ATOMIZERS**
- (a) **TYPE** - Micronair®, Beecomist®, or similar Department approved rotary atomizers are acceptable provided that the units have the capability of adjusting the screen rotation speed in order to change the droplet size. All rotary atomizers on an aircraft must be of the same type.
 - (b) **NUMBER AND SIZE** - Sufficient numbers of the proper size and type rotary atomizer must be provided for the particular aircraft being utilized in order to produce a uniformly dispersed spray cloud with a droplet volume median diameter (VMD) of 80-100 microns for Foray 76B, a VMD of 200 microns for Gypchek, and a VMD of 100-125 microns for Mimic 2LV.

- (c) **INSTALLATION/ADJUSTMENT/CALIBRATION** - The installation, adjustment, and calibration of the rotary atomizers, must be made in strict accordance with the manufacturer's recommendations to permit the application of the specified spray volume per acre. The flow rate for each individual rotary atomizer installed on a boom must not deviate ± 10 percent from the average flow rate for all rotary atomizers installed on the boom. Any rotary atomizer that deviates by more than ± 10 percent must be replaced. All units must be properly cleaned and serviced and be in good working condition when reporting on-site for calibration verification.

- (C) **CALIBRATION/CHARACTERIZATION** - The Contractor's spray aircraft must arrive on site properly calibrated for the insecticide and rate of application specified. The Department will verify the calibration by checking the flow rate of each aircraft prior to the start of the operation. If the calibration is incorrect, the Contractor must correct it immediately without causing any delay in the start of operations.

Dependent upon the delivery system and the application rate of the insecticide being used, calibration verification will be made using either water or the insecticide slated for application. The flow rate from the spray system will be monitored periodically during the spray operation and must be maintained within ± 5 percent of the desired flow rate.

Flights over card lines to characterize spray swath and droplet size may be required prior to the start of spray operations for certain aircraft as determined by the Department's Standardized characterization techniques, including the use of a nonpermanent dye in the spray material, will be utilized. There will be no separate additional charge to the Department for flights or for the insecticide used in making calibration or characterization checks.

10.5 ELECTRONIC RADIO, DGPS, AND TELEPHONE EQUIPMENT

- (A) **EQUIPMENT** - Prior to being approved by the Department, all spray and observation aircraft must be equipped with electronic communications and guidance equipment as described herein. The Contractor's project supervisor must also be supplied by the Contractor with a programmable portable or vehicle installed radio which meets the same specifications as given in Section 10.5(A)(2). All Contractor-furnished communications and guidance equipment for use in aircraft must be of types currently approved by the FCC and the FAA. The aircraft must be bonded and shielded so as to allow optimum radio communications. The following are required for all spray and auxiliary aircraft.
 - (1) **VHF COMMUNICATIONS** – The Contractor must equip each spray and auxiliary aircraft with panel mounted VHF-Am (VHF-1) aeronautical transceivers with a minimum of 760 channels covering 118.000 to 136.975 MHz. Each transceiver must have channels selectable in no greater than 25 kHz increments and a minimum of 5 watts carrier output power. The transceiver's operational controls must be mounted so they are readily visible and accessible to the pilot.

The receiver for the VHF communications system must not be part of a navigational system.

Each ground-support crew must be equipped with a mobile or portable VHF transmitter/receiver that will permit communication with the spray and/or auxiliary aircraft.

- (2) FM RADIO - Each spray and auxiliary aircraft must be equipped by the Contractor with a field-programmable, rack-installed or portable FM radio transmitter-receiver (10 watts output with a range of 150.0 MHz to 174.0 MHz), compatible externally mounted antenna designed for aircraft use, and a compatible crash helmet microphone/headset assembly for the pilot and each operating crewmember (microphone/headset assembly required for auxiliary aircraft pilot and crewmembers--helmet optional).
 - (3) SELECTOR SWITCH - Each spray and auxiliary aircraft must be equipped with a three-position selector switch that permits the pilot to simultaneously monitor both the VHF and FM systems in one position, monitor and transmit on the VHF system in another position, and monitor and transmit on the FM system in a third position.
 - (4) GPS - Each spray aircraft must have a permanently installed, panel mounted GPS utilizing an approved fixed external aircraft antenna and powered by the aircraft electrical system or an aviation portable GPS unit provided the portable unit is securely mounted, is equipped with a remote antenna, and presents information from an overhead orientation (not a drive-along-the-road-type), and is powered by the aircraft electrical system. The GPS must utilize the WGS-84 datum and reference latitude and longitude coordinates in the degrees/minutes/decimal minutes (DM) mode for aircraft positioning.
 - (5) TRANSPONDER - Each spray and auxiliary aircraft must have one air traffic control (ATC) transponder and altitude reporting system meeting the requirements of 14 CFR Part 91.215 (a) and (b).
 - (6) EMERGENCY LOCATOR TRANSMITTERS (ELT) – One automatic-portable/automatic-fixed or automatic-fixed ELT, certified to either Technical Standard Order (TSO)-C91a or TSO-C126, utilizing an external antenna and meeting the same requirements as those detailed for airplanes in 14 CFR Part 91.207 (excluding section f.). The ELT must be installed in conspicuous or marked location, with the required battery expiration date marking located in such a manner that is easily legible without de-mounting the ELT.
- (B) INSPECTION - The Department will inspect all radio and guidance system installations before the spray aircraft is approved. Installations and facilities that are substandard electrically or mechanically will not be approved. All radio systems must undergo an air-to-ground check to assure that clear and understandable communications exist. Any radio system that does not perform adequately in the opinion of the Department must be repaired or replaced by the Contractor before spray operations will be permitted to start.

- (C) RADIO PROGRAMMING - The Contractor's pilots must be trained in programming the radio provided and must be capable of programming it in the field. Testing of radios will be conducted during calibration prior to spray operations.
- (D) MAINTENANCE - The Contractor must provide evidence that the communication and guidance equipment furnished has been serviced, as required, by a qualified electronics maintenance shop. It is the responsibility of the Contractor to maintain in good working order all communications and guidance equipment it is required to furnish.

10.6 NAVIGATIONAL AIDS - All aircraft will be equipped with a working navigation/tracking, differentially corrected, global positioning system (DGPS). The pilot must have a working knowledge of the DGPS system installed in the aircraft that he will be operating. The Department is responsible for determining and, if necessary, editing the treatment area boundaries of all scheduled treatment areas and their associated exclusions, by utilizing GIS. The contractor is responsible for transferring the GIS data created by Department personnel into the digital file format required by use of the contractor's installed DGPS. In addition, the contractor is responsible for uploading the data into the application aircraft's DGPS. Each day after spraying is completed, the recorded flight files will be downloaded for analysis for the Department.

10.6.1. Aircraft DGPS Specifications: The make of the DGPS will be specified in the contract offer. Certain electronic guidance systems may not meet program requirements. Guidance systems that meet the following criteria are acceptable:

- 10.6.1.a. Contractor will provide DGPS system with software designed for parallel offset in increments equal to the assigned swath width of the application aircraft. A course deviation indicator (CDI) or a course deviation light bar must be installed on the aircraft and must be located in a position that will allow the pilot to view the indicator with direct or peripheral vision. Differential correction shall be provided by satellite using L-band frequencies.
- 10.6.1.b. The guidance system being used will allow the flight log to be downloaded to an on-site computer for post-flight analysis and review. The flight log must show the entire flight of the aircraft from takeoff to landing and differentiate between spray on and spray off when viewed on the computer monitor. The software must have the capability to zoom to any portion of the flight for viewing in greater detail and a method to determine distance between each flight lane. The system must be able to calculate and show total acres treated during the flight. The software must be compatible with color printers and differentiate between spray on and spray off on the printed copy.
- 10.6.1.c. The DGPS (*make and model, e.g. Satloc or AgNav or other*) proposed must have been operated successfully in a similar type aerial application program, and demonstrated success prior to the last 12 months. Provide name and phone number of previous clients or other users of the system who can validate the DGPS capabilities.

- 10.6.1.d. Pilot proficiency or evidence of prior experience with the proposed DGPS system must be demonstrated to the Department prior to award. To demonstrate proficiency the contractor must provide a copy of data (printed map and original electronic format) downloaded from DGPS proposed for use which was 1) conducted in the same type aircraft proposed for the use on this project, 2) flown in similar topography and aircraft altitude (generally below 200 feet AGL), and 3) collected within the last 12 months. The printed map must display the spray block boundary, the flight path of the aircraft and clearly differentiate between spray on and spray off.
- 10.6.1.e. If at any time the DGPS is not working properly the pilot must report this to the Program Supervisor. If the DGPS is not working properly during application, the pilot must return immediately to the airport.

10.6.2 Electronic Guidance and Support Furnished by the Contractor

- 10.6.2.a. All guidance equipment, materials, computers, printers, personnel, and services required for the system. The guidance equipment shall be capable of accurately guiding the aircraft, while flying at application altitude, along parallel flight lines equal to the assigned swath width of the application aircraft, in blocks designated by the Department. The system shall be sufficiently sensitive to provide immediate deviation indications and sufficiently accurate to keep the aircraft on the desired flight path. The guidance system shall be capable of updating current position at a minimum rate of five (5) times per second.
- 10.6.2.b. During operation, differentially corrected signal must be accurately recorded at least 95% of the operational time.
- 10.6.2.c. Post-flight processing computer and software capable of displaying track, altitude and groundspeed of aircraft during flight, with differentiation between standard flight and flight when the application system is on. Export file format must be compatible with Arc View/ArcInfo GIS systems or translatable to ArcView/ArcInfo systems and must be on a Department approved data storage media device.

10.6.3 Salient characteristics required for the DGPS system. The equipment offered must possess the following features:

- 10.6.3.a. Precision DGPS guidance with pilot-selected cross-track error readout adjustable to one (1) foot.
- 10.6.3.b. Easy to operate, user-friendly pilot's control keypad, with swath advance and decrement function.
- 10.6.3.c. Visual display monitor: 1) capable of displaying swath width over flight path; 2) mounted in the aircraft in a location that will allow the pilot to view the screen with direct or peripheral vision without looking down; 3)

- shall display in real time or be available for in-flight access immediately after application has ceased.
- 10.6.3.d. Shall have variable swath width entry.
 - 10.6.3.e. Record logging of application at a minimum rate of one-second intervals. Full record includes position, time, altitude, speed, cross-track error, track, application system on/off, aircraft tail number, pilot, job name or number, and differential correction status.
 - 10.6.3.f. System memory capable of storing up to 8 hours of continuous flight log data.
 - 10.6.3.g. Capability to accept pre-loaded reference waypoints (A-B Line). Must be able to store and retrieve, in-cockpit, at least 50 individual treatment blocks, each containing up to 50 points. Capability to link blocks together for combined treatment.
 - 10.6.3.h. Feature which alerts pilot when he/she is about to enter or exit a specific treatment block or an exclusion area within a block. A method to display nested polygons to indicated sensitive, or no-spray areas within treatment blocks.
 - 10.6.3.i. A course deviation indicator (CDI) or light bar which displays both cross-track error and intercept angle to desired heading must be installed on the aircraft in a location that will allow the pilot to view the indicator with direct or peripheral vision (heads up display).
 - 10.6.3.j. HOME navigational feature that provides instant range and bearing to home base airport or heli-base.
 - 10.6.3.k. MARK feature which allows return to pint in any swath before or after equipment shutdown.
 - 10.6.3.l. Warning method to indicate DGPS or Differential Correction failures.
 - 10.6.3.m. Pilot-adjustable intensity lighting for light bar, keypad, and moving map display.
 - 10..6.3.n. Capability to end log files, rename, and start new logs in flight.

10.7 AUTOMATED FLIGHT FOLLOWING - All spray aircraft must be supplied with an automated flight following (AFF) system. If the Contractor supplies the AFF system, see Attachment 3 for specifications. If the Contractor's spray aircraft does not contain an AFF system, the Department will supply a Spider Tracks unit for use in the spray aircraft in **2019**.

SECTION 11. GROUND-SUPPORT EQUIPMENT

11.1 INSPECTION - In order to execute the Contract, the Contractor must supply the Department with specifics on the ground-support equipment the Contractor will provide as specified in Section 3.2. The Contractor is not permitted to substitute ground-support equipment **three (3)** weeks prior to the start of the project. Any substitutions before that date must be with ground-support equipment of similar or greater capability. Department personnel may inspect this equipment and, at the Contractor's expense, conduct performance tests, as necessary, at a mutually agreed-upon site 60 days or less prior to the start of spraying operations.

11.2 ACCESSORY EQUIPMENT - All accessory equipment, including any vehicles necessary for transporting the insecticide from storage or from one operational site to another, is the responsibility of the Contractor. Accessory equipment supplied by the Contractor includes, but is not limited to, trucks, insecticide storage and/or mixing tanks (equipped for agitation and recirculation), pumps, hoses, metering devices, spill containment materials, and similar equipment necessary for handling the insecticide and loading the spray aircraft. The Contractor must also supply readily accessible and properly sized and coded fire extinguishers at each loading zone.

If required by contract logistics, the Contractor must supply sufficient accessory equipment so that each aircraft can work independently of each other [see Section 4 and Section 11.4(B)].

11.3 EQUIPMENT CLEANING - All equipment which comes in direct contact with the insecticide must be kept thoroughly clean and free of residues and foreign particulate matter.

11.4 FIELD TRUCKS

(A) **LIGHT-DUTY TRUCK** - The Contractor must supply a vehicle for each ground crew to use for transporting personnel, moving insecticides, running for parts, and similar duties. If the Contractor-provided nurse truck is unsuitable for conducting these errands in an expeditious manner, the Contractor must provide a pickup truck or other acceptable vehicle. Department owned vehicles may not be used for these purposes.

(B) **NURSE TRUCKS** - A truck or trucks equipped for transporting insecticide are required for each independently working spray aircraft or a group of spray aircraft working from a single loading zone. Truck and trailer combinations are acceptable if they meet all requirements of the Commonwealth of Pennsylvania Department of Transportation (PennDOT), do not exceed local road and bridge weight limits, and do not present maneuverability problems at the designated field worksites. Each independently working spray aircraft or group of spray aircraft working from a single loading zone must have sufficient ground-support equipment and personnel to adequately service it/them without causing any production delays.

The field truck or trucks supplying each aircraft must be designed to separately carry the insecticide concentrate, water, additives, and aircraft fuel to the worksite. The quantities transported to the worksite must be sufficient to supply aircraft working from

that site for five hours of spraying without exceeding the truck or road legal weight limits.

All trucks transporting aircraft fuel or other hazardous materials must be placarded and supplied with shipping papers as required under the U S Department of Transportation's Hazardous Materials Regulations (HAZMAT).

Each mix truck must be supplied with drum wrenches if barrels are being used.

11.5 TANK FARM - If working from a limited number of loading zones, the Contractor may, in-lieu of the nurse trucks specified, set up a tank farm, subject to all of the equipment specifications contained in Section 11, at each loading zone selected for the project area. This tank farm must be of sufficient capacity to supply and service all spray aircraft working from the loading zone. Sufficient equipment must be supplied so that each loading zone will be set up and operational far enough in advance of need so that no operational spraying time will be lost by any spray aircraft. If required by contract logistics, sufficient equipment must be provided so that each aircraft can be stationed and/or worked independently of each other.

11.6 FUEL TRUCKS - The Contractor must supply all fuel and lubricating oils required to operate all equipment during the contract period. All fuels must be commercial (or military) grade aviation fuel approved for use by the airframe and engine manufacturer. Only fuels meeting American Society of Testing and Material (ASTM) or Military specifications are authorized for use. **Smoking is prohibited within 50 feet of the aircraft and fuel servicing vehicles. All fuel operations are to be conducted in a secure area without presenting undue hazards to other aircraft or personnel.**

- (A) The Contractor must ensure that they are in compliance with 40 CFR Par 112: Oil Pollution Prevention: Spill Prevention, Control, and Counter measure Plan Requirements (SPCC). An SPCC plan is required for each mobile fueler used on this contract regardless of tank size.
- (B) Each aircraft fuel servicing vehicle shall have two fire extinguishers, each having a rating of at least 20-B:C.
- (C) Fuel trucks shall be properly maintained, clean and reliable. Tanks, pumping, filters, and other required equipment shall be free of rust, dirt, and other contaminants.
- (D) The Fuel Truck(s) shall be capable of transporting sufficient fuel to operate the application aircraft for a minimum of 8 hours.
- (E) The Fuel Truck(s) manufacturer's gross vehicle weights (GVW) shall not be exceeded. Barrels are not acceptable fuel containers.
- (F) The filtering system shall be equipped with a differential pressure monitoring system or fueling systems with which the pump produces more than 25 psi. Spare filters, fuses, seals, and other components on the fuel truck filtering system shall be stored in a clean, dry area. A minimum of one set is required.
- (G) All tanks shall be securely fastened to the truck bed and shall have a sump or sediment settling area of adequate capacity to provide uncontaminated fuel to the filter.

- (H) All hoses shall be properly secured and safeguarded when not in use. Only hoses designated for dispensing of fuel will be used. Hoses must be at least 50 feet in length. Fuel nozzle shall include a 100 mesh or finer screen, a dust protective device and a bonding clip or plug.
- (I) Fuel Truck(s) shall have adequate bonding cables and shall be utilized in accordance with National Fire Protection Association (NFPA) Manual 407.
- (J) Markings: "NO SMOKING" signs with three-inch minimum letters visible for both sides and rear of the truck. Each fuel-servicing vehicle shall be conspicuously and legibly marked to indicate the nature of the fuel. Fuel truck(s) must be placarded in accordance with 49 CFR 172.

11.7 TANKS

- (A) GENERAL - All tanks used to transport insecticides must be leak-proof and corrosion resistant. Filler openings and air vents must be adequate to prevent surging during filling. All tanks must be equipped with properly fitting covers or hatch plates that must be kept closed except when filling or circulating to reduce the change of contamination with foreign materials. All covers and hatches should be secured during off-duty hours.
- (B) CLEANING - All tanks must be thoroughly cleaned and free of rust, residues, and particulate matter, such as grit and sand. The Department must inspect all tanks before they are filled with insecticide or water.

11.8 PUMPS

- (A) WATER PUMP - Each truck used to transport water must be equipped with a pump capable of drafting water a vertical distance of at least ten (10) feet. The truck must be equipped with a non-collapsing suction hose, an anti-siphon device or check valve, a coarse screen, and a bucket. The configuration must be such that water being taken into the truck can be metered if needed, and it must pass through a strainer no coarser than 50 mesh.
- (B) CIRCULATION PUMP - The pump used for circulation and loading must produce a sufficient flow rate to fill the aircraft in a maximum of three minutes without producing high pressures.
- (C) INSECTICIDE PUMP - The pump used for drafting the undiluted insecticide from a 55-gallon drum must be capable of repeatedly emptying a drum in less than three minutes.
- (D) NUMBER OF PUMPS - The same pump may be used for all purposes if a single truck is used for mixing and for transporting water and insecticide, provided all requirements are met. If a separate truck is used for any of these purposes, it must have its own pump.

- (E) PUMP SEALS - All pump seals must be chemically and abrasively resistant to the spray material being used (tungsten carbide or silicon carbide components are suggested).
- (F) PROHIBITED PUMPS - No high-pressure piston pumps or hand pumps are permitted.

11.9 METERS

- (A) GENERAL - The insecticide-handling system must be designed to accurately meter water and insecticide concentrate. If the system or insecticide storage system is designed such that air could be sucked into the lines and cause erroneous meter readings, the meter must be equipped with an air eliminator.

A strainer no finer than 30 mesh must be installed in line to screen the solution prior to entering the meter.

The meter must be capable of safely handling the flow rate necessary for loading the aircraft.

Meters with lighted digital displays must be shaded so that they are not difficult to see in direct full sunlight.

- (B) CALIBRATION - The Contractor must provide evidence that all metering devices employed have been inspected and calibrated by a licensed inspector within two months prior to the start of the spraying operation. At or before the time the Contractor's aircraft are calibrated, the Contractor must supply the Department with a copy of the inspector's calibration report for each meter used in the project.

All meters used to measure the volume of insecticide at any time during the operation must be calibrated and certified using the insecticide formulation to be used on the project or the meter must be calibrated and certified as capable of accurately measuring various materials, each with a different viscosity without being recalibrated for each material.

SECTION 12. BONDS AND INSURANCE

- 12.1 PERFORMANCE BOND AND LABOR AND MATERIAL BOND** - The Contractor(s) must furnish the Contracting Officer within ten (10) calendar days of notification of award a duly executed Commonwealth of Pennsylvania Standard Performance Bond and a STATE Standard Labor and Material Payment Bond payable to the Commonwealth of Pennsylvania, and in an amount at least equal to **60 percent of the accepted bid** as guarantee for the faithful performance of the contract and the payment to all persons who have, and fulfill, contracts which are employed by the Contractor(s). The Sureties of all bonds shall be of such Surety Company or companies as are approved by the Commonwealth of Pennsylvania and are authorized to transact business in the Commonwealth of Pennsylvania. No contract shall be deemed to be in effect until the bonds have been approved by the Contracting Officer. **A letter of credit may be used in place of a surety bond to meet the performance bond requirements only.**

12.2 INSURANCE

- (A) GENERAL REQUIREMENTS - The Contractor and any subcontractor shall purchase and maintain during the term of the contract, and any extension thereof, liability insurance in such form and by such company as may be acceptable to the Department.

Within 10 days after notification of award, the Contractor must provide the Commonwealth of Pennsylvania with current Certificates of Insurance. These certificates shall contain a provision that coverage afforded under the policy shall not be canceled until at least thirty (30) days prior written notice has been given to the Commonwealth of Pennsylvania.

- (B) COVERAGES AND LIMITS - The required insurance must include the following coverages and minimum limits:

- (1) AIRCRAFT LIABILITY - \$1,000,000 single limit for each occurrence for bodily injury and property damage combined.

- (3) AIRCRAFT PASSENGER LIABILITY - \$1,000,000 single limit for each occurrence. Required for observation aircraft only.

- (4) CHEMICAL LIABILITY – Restricted chemical category coverage at limits not less than:

\$100,000 bodily injury per person
\$300,000 bodily injury per occurrence
\$100,000 property damage per occurrence

Must include coverage for treating urban and residential areas.

- (5) AUTOMOTIVE LIABILITY - \$1,000,000 single limit for each occurrence for bodily injury and property damage combined. Covers Contractor support equipment (e.g. fuel truck, personal vehicle, etc.)

- (6) AIRPORT/PREMISES LIABILITY - \$500,000 single limit for each occurrence for bodily injury and property damage combined.

- (7) LIABILITY FOR LOSS OR DAMAGE TO PROPERTY - Coverage limit of at least \$300,000 for each occurrence.

- (8) LIABILITY FOR BODILY INJURY TO OR DEATH OF PERSONS - A limit of at least \$100,000 for each person in any one occurrence, and a limit of at least \$300,000 for each occurrence.

- (9) WORKER'S COMPENSATION INSURANCE - Limits sufficient to cover all of the employees of the Contractor working to fulfill this contract.

- (C) SUBCONTRACTORS/LEASED EQUIPMENT - If any work under this contract is subcontracted or otherwise performed by anyone other than the Contractor or performed with equipment subcontracted or leased by the Contractor, the Contractor must provide evidence that the specified liability insurance for any persons and/or equipment so subcontracted or leased is provided for under a policy(s) maintained by the subcontractor.
- (D) IDEMNITY CLAUSE - It has been suggested by the US Aviation Underwriters that the indemnity be written so that the applicator holds the state harmless for property damage and bodily injury resulting from the negligence of the applicator and that the state agree to hold the applicator harmless for property damage and bodily injury resulting from the negligence of the state.

Prior to commencement of the work under the Contract and at each insurance renewal date during the term of the Contract, the Contractor shall provide the Commonwealth with current certificates of insurance. **These certificates or policies shall name “The Commonwealth of Pennsylvania-DCNR” as an additional insured and shall contain a provision that the coverages afforded under the policies will not be cancelled or changed until at least thirty (30) days written notice has been given to the Commonwealth.** These certificates shall include the location and a brief description of the work to be performed under the contract.

The Commonwealth shall be under no obligation to obtain such certificates from the Contractor(s). Failure by the Commonwealth to obtain the certificates shall not be deemed a waiver of the Contractor’s obligation to obtain and furnish certificates. The Commonwealth shall have the right to inspect the original insurance policies.

SECTION 13. AGREED LIQUIDATED DAMAGES FOR FAILURE TO PERFORM

13.1 INTRODUCTION - Due to the behavior of the gypsy moth and other forest insect pests, the amount of time during which successful treatment can be made is limited. For this reason, delays caused by the Contractor during periods of acceptable spray conditions are potentially damaging to the outcome of the program. In addition, such delays are costly to the Department and therefore subject to the assessment of agreed damages for failure to perform. Repeated occurrences of failure to perform actions are sufficient grounds for contract termination and removing the Contractor's name from the list of acceptable bidders for future projects.

The Contractor is not liable for agreed damages if the failure to meet the terms of the contract arises out of causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to, acts of God or of the public enemy, acts of the Commonwealth of Pennsylvania in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but in every case, the failure to perform must be beyond the control and without the fault or negligence of the Contractor.

Any incident in which a Contractor is assessed damages as described in this section must be documented in writing by the Field Project Coordinator and submitted to the program

supervisor for approval. A copy of this report will be given to the Contractor. All approved reports will be subject to the appropriate provisions, and assessed costs will be deducted from the final payment made to the Contractor. The burden of proof to dispute these assessments is upon the Contractor.

The following items are considered failure-to-perform acts subject to the specified monetary assessment.

13.2 LATE ARRIVAL - Notice will be given to the Contractor of a time and location to have its equipment assembled for the program start (Section 2.4). This is usually a day or two before actual spraying, and is needed for calibration checks, characterization flights, final inspection, pilot briefing, and pre-work briefing. At that time, the aircraft, its equipment, and ground-support equipment must be ready and operating according to Contract Specifications. Also, pilots and ground-support personnel must be on site and ready to perform as required by the Contract Specifications. Failure to arrive within two hours of the agreed time on the specified day may be assessed against the Contractor at the rate of **\$1,000 per aircraft per day**. Arrival on time but failing to have all the equipment and personnel on site and/or operational and which causes a delay in calibration checks of two hours or more may be assessed against the Contractor at the rate of **\$1,000 per aircraft**. Failure to arrive on the specified day or a delay that makes it impossible to properly calibrate on the scheduled day may be assessed at the rate of **\$5,000 per aircraft per day**.

13.3 TARDINESS - The first trip takeoff for morning sessions may start as early as 30 minutes before sunrise or any time after this that may be mutually agreeable to the Department and the Contractor on a daily basis (Section 8.7). The Contractor's personnel must be at the worksite far enough in advance of the first trip takeoff time to have the aircraft checked, engines warmed up, and insecticide properly loaded, agitated and ready for takeoff when conditions are acceptable. If it becomes necessary to move the aircraft from the operational worksite to another overnight location for security or other reasons, care must be exercised to avoid selecting a fog or "frost pocket" location that could postpone takeoff and thereby delay or cancel the operation for the following day. A delay in the first trip takeoff due to tardiness when conditions are acceptable for spraying may be assessed against the Contractor at a rate of **\$1,000 per hour or portion thereof per aircraft per session**.

13.4 DELAYS - The number of personnel (Section 9) and the quantity and quality of insecticide, water, and aircraft fuel at the loading site must be sufficient to keep each aircraft in full production for a minimum period of five consecutive hours [Section 11.4(B)]. A shutdown or delay caused by a shortage of qualified personnel and/or a lack of acceptable insecticide, water, or fuel when spraying conditions are acceptable during this five-hour period may be assessed against the Contractor at the rate of **\$1,000 per hour or portion thereof of acceptable spray time lost per aircraft per occurrence**.

Any other Contractor-caused delay including, but not limited to, failure to supply the required aircraft, equipment failures, aircraft problems, failure to have an approved FAA waiver for the treatment of congested areas, or spray pilot difficulties with navigation, spray block reconnaissance, spray block orientation, and/or electronic equipment operation may be assessed against the Contractor at the rate of **\$1,000 per hour or portion thereof of acceptable spray time lost per aircraft per occurrence**.

Only one delay of up to 15 minutes that results in the loss of acceptable spray time, for any reason, is permitted per aircraft per day.

13.5 LOADING ZONES - Failure to have an adequate number of loading zones designated two (2) weeks prior to the start of the project as specified (Section 5.7) may be assessed against the Contractor at the amount of **\$5,000**. Additional or alternative worksites used during the operation that were not designated by the due date may be assessed at the rate of **\$500 per site**.

If locating additional sites results in a loss of acceptable application time, damages will accrue as specified in Section 13.4 and may be assessed as specified.

13.6 IMPROPER APPLICATION - A uniform application at the proper droplet size and rate per acre within the designated area is essential for a successful program (Section 10.4). Where faulty application makes it necessary to respray areas not satisfactorily covered by the Contractor, the Contractor must respray such areas at the Contractor's expense (Section 8.4). The Contractor will not be paid for any acreage treated outside the designated block boundaries (Section 2.3).

Spraying insecticide at concentrations other than those prescribed in these Contract Specifications (Section 4) may be assessed against the Contractor at the rate of **\$5,000 per incident**.

13.7 OTHER SPRAYING - The equipment and personnel under contract to the Department are not permitted to do any other spraying for individuals, companies, or agencies while the contract is in effect without a written release [Section 10.1(J)]. Violation of this restriction may be assessed at the rate of **\$5,000 per incident**.

13.8 INSECTICIDE LOSSES, SPILLS, AND DUMPS - The Contractor will not be compensated for any Contractor-supplied insecticide which is lost, spilled, dumped, or otherwise made unavailable (Section 5.6).

If any insecticide loss, spill, or dump results in a loss of acceptable spray time, damages will accrue as specified in Section 13.4 and may be assessed as specified.

13.9 POOR PILOT PERFORMANCE - The Department reserves the right to permanently reject any pilot, who, in its opinion, violates these Contract Specifications, is unsafe, or otherwise performs unsatisfactorily [Section 9.3 (I)]. In such an event, the Contractor must furnish a replacement pilot within 24 hours who is capable and qualified to safely fly and properly perform the application. Failure to furnish a replacement pilot within the specified time may be assessed against the Contractor at the rate of **\$5,000 per day**. In addition, damages as specified in Section 13.4 will accrue from the time of grounding and may be assessed as specified.

13.10 AIRCRAFT MALFUNCTION - It is understood that aircraft will occasionally malfunction even with proper maintenance [Section 10.1.(I)]. No assessment will be charged to the Contractor for the first such malfunction if the aircraft can be made operational within 24 hours. After the 24-hour period, damages may be assessed at the rate of **\$1,000 for each hour or portion thereof of acceptable spray time lost**. Only one 24-hour, no-assessment period will be granted for each aircraft during the course of the spraying operation. If an aircraft suffers from frequent mechanical problems, the Department will notify the Contractor

that the aircraft must be replaced with an aircraft of similar capability within 24 hours. The replacement aircraft must be covered by the Contractor's insurance policies. Failure to provide an acceptable replacement within the allotted time may be assessed against the Contractor at the rate of **\$5,000 per day**. In addition, damages as specified in Section 13.4 will accrue from the end of the allotted time and may be assessed as specified.

13.11 DGPS DATA - Failure to provide the data collected daily by the spray aircraft's DGPS (Section 10.6) may be assessed at the rate of **\$500 per incident**.

SECTION 14. BID AWARD

Bidder must complete and return the following:

- A. The electronic Invitation for Bid to be found at www.pasupplierportal.state.pa.us,
- B. A properly executed Reciprocal Limitations Act form that lists the state of manufacture for any supplies procured.
- C. A copy of your current, valid Pesticide Application Business License.

The bid will be awarded based on the lowest total sum on the IFB-Invitation for Bid.

The contract quantities herein are estimated only and may increase or decrease depending on the needs of the Department. The Contractor shall be paid at the unit price bid for actual work performed.

Please note that the Department will only accept out to two (2) decimal points when entering your pricing.

SECTION 15. CONTRACT TERM

The contract term shall commence upon execution and receipt of purchase order and terminate **December 31, 2019**.

Further, the parties may agree to renew this contract up to two (2) additional consecutive, annual terms, with the final termination date of December 31, 2021, upon the same terms and conditions set forth in the contract. The Department, based on past contractor performance, may negotiate an increase in the unit price(s) by a rate not to exceed 3%.

The Department will reach out to the Contractor no later than August 31 prior to the termination date to begin renewal discussions.

Once the renewal terms are mutually decided, the Contractor shall provide written notification of the intent to renew, including the requested price increase if desired, to the Department no later than September 30 prior to the termination date. The renewal notice should be mailed or faxed to:

DCNR – Bureau of Forestry
Division of Forest Health
PO Box 8552
Harrisburg, PA 17105-8552

The Commonwealth has the right to cancel this contract if contractor fails to perform duties set forth in this contract.

SECTION 16. INVOICES

INVOICES:

Invoice format shall be in accordance with the IFB – Invitation for Bid.
All invoices for this contract **MUST** either be:

1. Emailed to the following for a Paperless Email Invoice Option:

Email a copy of the correctly executed invoice to: 69180@pa.gov.

For information on the Commonwealth's E-Invoicing Program, visit:
<http://www.budget.pa.gov/Programs/Pages/E-Invoicing.aspx>.

2. Or, mailed to the following address:

Commonwealth of PA – PO Invoice
P.O. Box 69180
Harrisburg, PA 17106

A copy of the invoice(s) **MUST** also be faxed to:

(717) 783-7960
DCNR
Bureau of Forestry
Division of Forest Health

All invoices **MUST** have the purchase order number, as well as your SAP Vendor Number on the invoice. The name and address listed on the purchase order must also be listed on each invoice. Failure to provide this information may result in a delay of payment.

Please Note: Vendors are reminded to **NOT** include employer identification numbers, Social Security Numbers, bank account information, or other personally identifiable information on their invoices. That information is uniquely tied to your SAP Vendor Number and, for security purposes, should not be explicitly stated on an invoice.

SECTION 17. RECEIPT AND OPENING OF BIDS

Bids must be submitted via the PA Supplier Portal, to be found at www.pasupplierportal.state.pa.us.
Faxed bids and mailed bids will not be accepted.

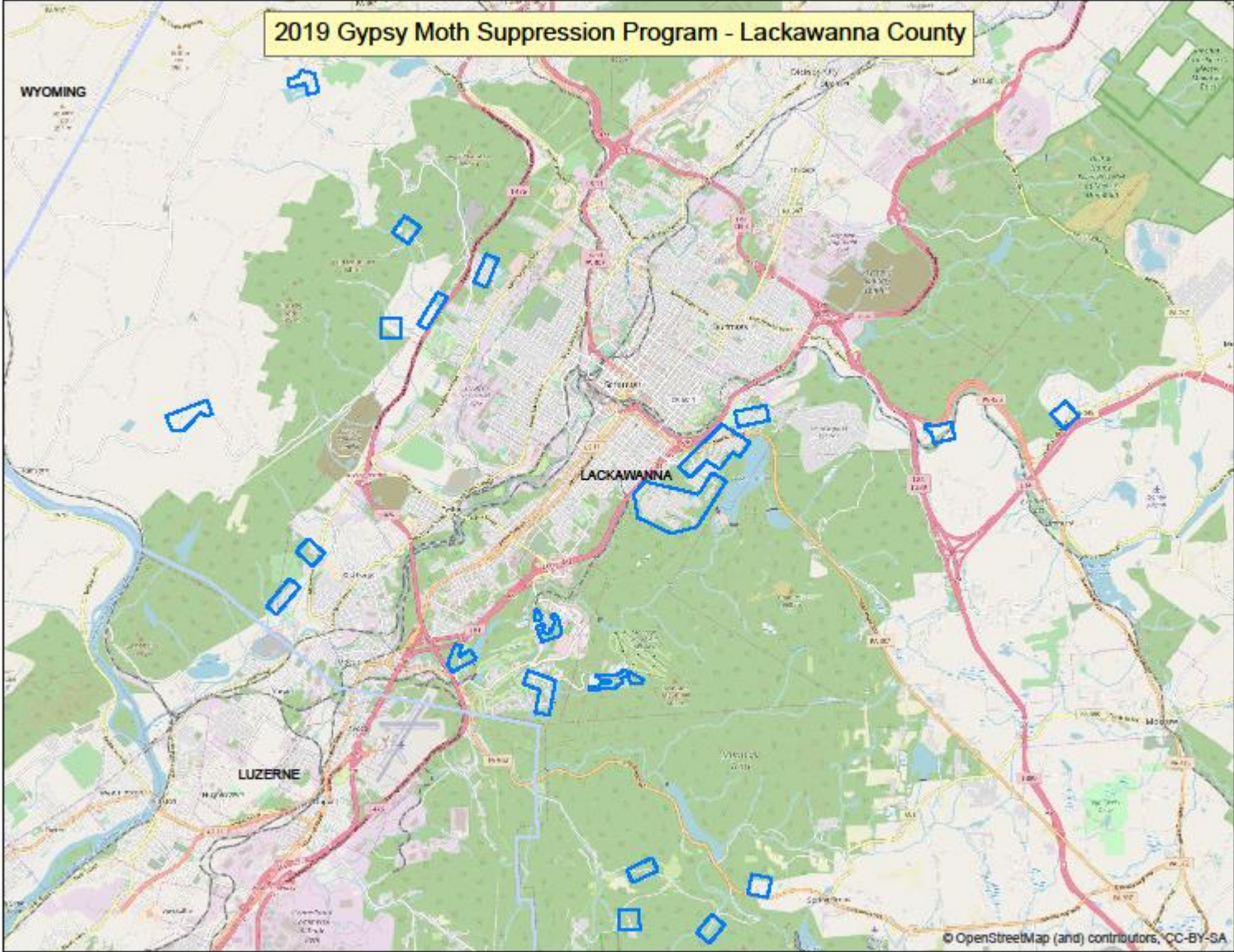
No responsibility will be attached to any employee of the Department for the premature opening of, or the failure to open, a bid not properly addressed and identified, or for any reason whatsoever.

SECTION 18. BID RESULTS

Bidders can obtain bid results by accessing www.emarketplace.state.pa.us/bidtabs.aspx. The bids will be posted within three (3) business days following the bid opening. The results are the apparent bidders, and all bids are under review until final award of the purchase order.

APPENDIX

APPENDIX A: Map of Project Area



APPENDIX B: Contractor Submittal Sheet

Pre-Award

Information to be submitted to Contracting Officer by the date indicated in the notification letter to be received by awarded contractors (see Section 3.2)

1. Performance Bond and a labor and material bond
2. Evidence of insurance during the life of the contract
3. Evidence that any out-of-state contractor or subcontractor is registered or has made application to be registered in the state.
4. Evidence of insurance during the life of the for all subcontractors

Information to be submitted to the Program Supervisor by date indicated in the notification letter (see Section 3.2)

1. Application for Spray Pilot Approval Form for each spray pilot and alternate spray pilot.
2. Aircraft Description Form for each spray aircraft, alternate spray aircraft, and observation aircraft.
3. Report on the designated personnel and equipment.
4. Pilot proficiency of GPS - copy of data (printed map and electronic format) downloaded from GPS proposed for use (Section 10.6.1.d).

Post-Award

Information to be submitted to the Program Supervisor

1. Pesticide Application Business License – 10 days after notification of Award (Section 5.2).
2. FAA waiver for congested areas – two weeks prior to the start of project (Section 5.5).
3. Location of Loading Zones or Airfields – one month prior to the start of project (Section 5.7).
4. Contractor's Safety Plan – two weeks prior to the start of project (Section 5.12)
5. Substitution of Designated Aircraft (If Applicable) – three weeks prior to the start of the project (Section 10.1.B).

ATTACHMENT 1: SPRAY AIRCRAFT PILOT APPROVAL FORM

1. Personal Information

a. Name (Last, first, middle initial)	b. Home telephone	<i>Type or print all information in ink. Complete resume below. Return completed and signed form to the Field Project Coordinator. See Contract Specifications for name and address.</i>
c. Home address	d. City, State, and Zip Code	
e. PA Department of Agriculture Category 05 (Forest Pest Control) pesticide applicator's license number:		

2. Emergency Contact

a. Name	b. Address, City, State, Zip Code	c. Telephone	d. Relationship
---------	-----------------------------------	--------------	-----------------

3. Employer Information (relative to employment on the PA Bureau of Forestry program)

a. Name of employer	b. Address, City, State, Zip Code	c. Is employer: Primary contractor ____ Subcontractor ____
d. Is employment: Full-time ____ Seasonal ____	e. Employer's PA Department of Agriculture's pesticide application business license number:	

4. Airman Certificate Information

a. Type: COMM ____ ATP ____	b. Certificate number	c. Current instrument rating: Yes ____ No ____	d. Type ratings (include heavy A/C type ratings):	e. FAR Part 137 qualified: Yes ____ No ____
--------------------------------	-----------------------	---------------------------------------------------	---------------------------------------------------	------------------------------------------------

5. Medical Information

a. Classification	b. Date of current medical certificate	c. Limitations
-------------------	----------------------------------------	----------------

6. Experience/Training/Proficiency

a. Flight Experience as Pilot-In-Command (Hours)	Total	Past 12 Months	b. Has any previous approval been denied, suspended, or revoked in Pennsylvania or on any state, federal, or other program? Yes ____ (explain on reverse) No ____
All aircraft (1,000 hours required)			
Night (10 hours required)			c. List any related schools or training sessions attended within the last three years (if none, check here ____)
Type (rotary or fixed-wing) to be flown on contract (500 hours required)			
Weight class (category) to be flown on contract (100 hours required)			
Make, model, and series to be flown on contract (20 hours required)			
Forest pesticide application in terrain typical of contract area (50 hours required)			
Takeoffs/landings at altitude typical of project area with loads similar to an average spray load (20 required)			
Number of seasons of aerial spraying over forested areas (2 required)			d. Have you had any aircraft accidents within the past three years? Yes ____ (explain on reverse) No ____
e. Are you proficient in reading and navigating with 7.5 minute quadrangle and other scale topographic maps? Yes ____ No ____		f. Are you proficient in the use and operation of the aircraft's electronic tracking and guidance systems? SATLOC (Yes ____ No ____); AgNav (Yes ____ No ____) Number of hours flown with either in past 12 months: _____	

7. Resume (list recent forest aerial spraying experience by year)

Year	Agency/Location	Contact Person*	Aircraft	Pest

ATTACHMENT 2: AIRCRAFT DESCRIPTION FORM

1. Spray Project Contractor Information

a. Name	b. Telephone	Type or print all information in ink. Return completed and signed form to the Field Project Coordinator. See Contract Specifications for the name and address.
c. Address	d. City, State, and Zip Code	
e. Contractor's PA Department of Agriculture pesticide application business license number:		

2. Aircraft Owner Information

a. Aircraft is (check one): Owned _____, subcontracted _____, or leased _____ by the spray project contractor			
b. Owner's Name	c. Address	d. City, State, and Zip Code	e. Telephone

3. Aircraft Description and Information

a. Type of aircraft (check one): Spray fixed-wing _____ Spray helicopter _____ Observation fixed-wing _____ Observation helicopter _____				b. Qualified under: FAR Part 135 _____ FAR Part 137 _____	
c. Aircraft: Make _____ Model _____ Series _____		d. Number of engines	e. FAA Number N _____	f. Year built	g. Passenger capacity
h. Registration certification Yes _____ No _____	i. Airworthiness certification Yes _____ No _____	j. Cruising speed: MPH _____ Knots _____		k. Hours of fuel	
l. Time since 100-hour inspection		m. Registration category			
n. Major modifications					

4. Airframe

a. Hours since new	b. Used for acrobatics: Yes _____ No _____	c. Parking brakes: Yes _____ No _____	d. Paint scheme
--------------------	-----------------------------------------------	------------------------------------------	-----------------

5. Engines

a. Make and model	b. Horsepower	c. Type fuel	d. Supercharger: Yes _____ No _____
e. Hours since new: Engine 1 _____ Engine 2 _____		f. Hours since major overhaul: Engine 1 _____ Engine 2 _____	
g. Hours before next major overhaul: Engine 1 _____ Engine 2 _____			

6. Propellers

a. Hours since overhaul Number 1 _____ Number 2 _____

7. Helicopter Components

a. Hours since new: Main rotor _____ Tail rotor _____ Transmission _____		b. Hours since overhaul: Main rotor _____ Tail rotor _____ Transmission _____	
c. Hours before next overhaul: Main rotor _____ Tail rotor _____ Transmission _____		d. Drop stops: Yes _____ No _____	e. Skids: Yes _____ No _____
f. Rotor brakes: Yes _____ No _____		g. Other (specify)	

8. Instruments

a. Fuel quantity: Yes _____ No _____	b. Stall warning: Yes _____ No _____	c. Airspeed: Yes _____ No _____	d. Clock: Yes _____ No _____	e. Compass: Yes _____ No _____	f. Turn and bank: Yes _____ No _____
g. Directional gyro: Yes _____ No _____	h. Artificial horizon: Yes _____ No _____	i. Altimeter: Yes _____ No _____	j. Rate of climb indicator: Yes _____ No _____		

9. Condition

a. Glass: Good _____ Fair _____ Poor _____	b. Fabric: Good _____ Fair _____ Poor _____	c. Tires: Good _____ Fair _____ Poor _____	d. Paint: Good _____ Fair _____ Poor _____
e. Seat belts: Good _____ Fair _____ Poor _____	f. Shoulder harness: Good _____ Fair _____ Poor _____	g. Cabin: Good _____ Fair _____ Poor _____	h. Cockpit: Good _____ Fair _____ Poor _____

10. Emergency Equipment

a. First aid kit: Yes _____ No _____	b. Engine fire extinguisher: Yes _____ No _____	c. Cabin fire extinguisher: Yes _____ No _____
-----------------------------------------	----------------------------------------------------	---------------------------------------------------

11. Electrical System

a. Volts	b. Auxiliary Power Unit: Yes _____ No _____	c. H/D battery Yes _____ No _____	d. Ammeter Yes _____ No _____
----------	------------------------------------------------	--------------------------------------	----------------------------------

12. Lights

a. ant-collision beacon: Yes _____ No _____	b. Landing: Yes _____ No _____	c. Cockpit Yes _____ No _____	d. Position: Yes _____ No _____	e. Other (specify)
------------------------------------------------	-----------------------------------	----------------------------------	------------------------------------	--------------------

13. Radios and Guidance Equipment

a. VHF system installed as specified: Yes _____ No _____	b. FM radio installed as specified: Yes _____ No _____	c. Selector switch for simo-monitoring of VHF and FM: Yes _____ No _____
d. GPS guidance system installed: Yes _____ No _____	f. ETGARS installed: Yes _____ (Make/Model _____) No _____	

14. Spray System

a. STCs or 337s for all components: Yes _____ No _____	b. Total tank capacity: _____ gallons	c. Emergency dump system: Yes _____ No _____	d. Operating load capacity: _____ gallons	e. Spray system make
f. Nozzles: Hydraulic _____ (Type _____ Size _____) Rotary atomizer _____ (Make _____ Model _____)			g. Electronic flow-metering system: Yes _____ (Make/Model _____) No _____	

15. Pilots Authorized to Fly Described Aircraft:

Name	Total Flight Hours	Special Qualifications	Rating	FAA Medical Date	FAA License Number

16. Certification

I certify that the information contained herein is accurate.

Signature – Contractor Title Date

17. Review – Field Project Coordinator

I have reviewed the information provided. Based upon that review, my determination of the aircraft's compliance with the requirements for aircraft as set forth in the _____ forest insect pests suppression program contract specifications is as follows: _____ meets requirements; _____ does not meet requirements. If rejected, see explanation below.

Signature – Field Project Coordinator Date

18. Review – Aircraft Operations & Safety Specialist

I have reviewed this information and am in agreement with the decision of the field project coordinator.

Signature – Aircraft Operations & Safety Specialist Date

19. Reasons for Rejection

ATTACHMENT 3: Automated Flight Following

General

Satellite based aircraft tracking hardware is required in all aircraft. The aircraft tracking hardware shall be powered by the aircraft's electrical system, installed per the manufacturer's installation manual, and operational in all phases of flight. The satellite based aircraft tracking hardware shall utilize as a minimum:

1. Satellite communications,
2. An externally or internally mounted antenna.
3. Aircraft power via a dedicated circuit breaker for power protection, and
4. Secure mounting so as to not endanger any occupant from aircraft hardware during periods of turbulence.

Antennas should be placed to maximize the view of the overhead sky. Externally mounted antennas are recommended to improve system performance.

Any manufacturer required pilot display(s) or control(s) shall be visible or selectable by the pilot(s). Remote equipment having visual indicators should be mounted in such a manner as to allow visual indicators to be easily visible.

Satellite based aircraft tracking communications shall be fully operational in the Commonwealth of Pennsylvania.

The contractor shall maintain a subscription service through the satellite based aircraft tracking hardware provider allowing position reporting for satellite tracking via the provider's website. The provider's website must be secure and access to the website must require a username and password. The position-reporting interval shall be a minimum of every two minutes while the aircraft is in flight. Although not required, the ability to import and display shapefiles of the treatment block boundaries on the provider's mapping service and website display is an advantage.

Prior to the aircraft's contract inspection, the Contractor shall perform an operational check of the system. As a minimum, the operational check at inspection shall consist of confirming the aircraft being tested is displayed on the provider's website (indicating it is currently transmitting data) and that all information displayed on the website is correct.

If the satellite base aircraft tracking hardware becomes inoperable/unreliable the aircraft may, at the discretion of the Government, remain available for service utilizing radio/voice system for flight following. The contractor will return the system to full operational capability within 72 hours after the inoperative/unreliable unit is first discovered as defective.

Single Access Viewing

The government does not specify particular satellite aircraft tracking hardware providers but single access viewing of the aircraft data is required. That is, all of the Contractor's aircraft must be visible on a single screen at one secure website. The Contractor can accomplish this in two ways:

1. All of the aircraft have satellite based aircraft tracking equipment from the same provider and all aircraft are viewable at one secure website

OR

2. Multiple providers are used to equip the aircraft with satellite based tracking hardware which cannot be accessed at a single secure website; thus
 - a. All satellite based aircraft tracking hardware must be compatible with the government's Automated Flight Following (AFF) program (<https://aff.gov>) which allows position reporting from multiple providers to be viewed via single access using the government's AFF viewing software or
 - b. Some other arrangement must be negotiated that is acceptable to the government for single access viewing.

If the Contractor plans to use more than one satellite based aircraft tracking provider, the Specification Section Supplement available at: <https://www.aff.gov/contractspeccs> is herein incorporated with the same force and affect as if they were presented as full text. Not all available satellite based tracking systems are compatible with the Government's AFF Program, nor meets AFF's requirements. If the Contractor plans to use the Government's AFF Program, the Contractor shall ensure that the aircraft hardware offered is compatible with AFF. For questions about current compatibility requirements contact the AFF Program Manager listed under contacts at <https://www.aff.gov>. Additionally:

1. The contractor shall maintain a subscription service through the AFF aircraft hardware provider allowing AFF position reporting for satellite tracking via the Government AFF viewing software. The contractor shall register their AFF aircraft hardware with the Government through <https://www.aff.gov> providing: complete tail number; manufacturer and serial number of the AFF transceiver; aircraft make and model; and contractor contact information.
2. If the contractor relocates previously registered AFF aircraft hardware into another aircraft, then the contractor shall contact the government's AFF Program making the appropriate changes prior to aircraft use. In all cases, the contractor shall ensure that the correct aircraft information is indicated within AFF. The contractor shall contact the Government of system changes, scheduled maintenance, and planned service outages.
3. Registration contact information, a web accessible feedback form, and additional information is available at: <https://www.aff.gov>.
4. Prior to the aircraft's contract inspection, the Contractor shall ensure compliance with all AFF systems requirements. The Contractor shall additionally perform an operational check of the system. As a minimum, the operational check shall consist of confirming the aircraft being tested is displayed in AFF (indicating it is currently transmitting data to AFF) and that all information displayed in AFF is current.
5. A username and password are required to access AFF. Log on to the AFF website at <https://www.aff.gov> to request a username and password.