Preparing for a Post Storm Aerial Spray Hurricane Florence 2018

Cris Harrelson

Brunswick County Health Director

Overview of Health Director's Responsibilities Post Disaster

- Shelters
  - Still operating until roads are safe and private residences/communities are cleared for return
  - Shelter support (e.g. staffing, food, water, medical supplies)
  - Communicable Disease Surveillance

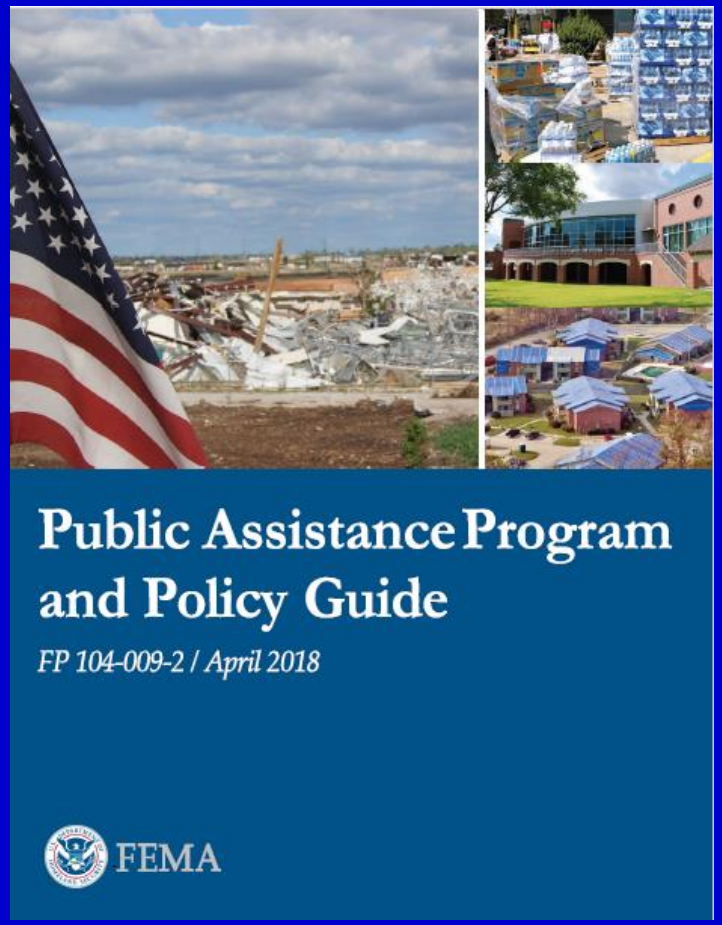
- Environmental Health
  - Private Well Assessments
  - Inspection of restaurants, child care centers, and other facilities
  - Assessment of on-site wastewater systems

FEMA Public Assistance Program and Policy Guide (PAPPG)

- The PAPPG is a comprehensive, consolidated program and policy document for the Public Assistance Program. Version 3.1 of the PAPPG supersedes all previous publications and the majority of previous policies. Any policy or guidance document not superseded by the PAPPG is provided below. Version 3.1 of the PAPPG is applicable for disasters declared on or after August 23, 2017

- FP 104-009-2 Public Assistance Program and Policy Guide (PAPPG) V3.1 **(April 2018)**

Mosquito Abatement



- **Mosquito Abatement**
- Mosquito abatement measures may be eligible when a State, Territorial, Tribal, or local government public health official validates in writing that a mosquito population poses a specific health threat as discussed further in Appendix G: Mosquito Abatement. FEMA consults with the CDC to determine the eligibility of mosquito abatement activities. FEMA only provides PA funding for the increased cost of mosquito abatement. This is the amount that exceeds the average amount based on the last 3 years of expenses for the same period

FEMA Public Assistance Program and Policy Guide (PAPPG) April 26, 2018

- The Public Assistance Program and Policy Guide (PAPPG) combines all Public Assistance (PA) policy into a single volume and provides an overview of the PA Program implementation process with links to other publications and documents that provide additional process details. This document incorporates and supersedes language from PA Program publications and 9500 Series documents. FEMA has archived superseded PA publications and policy documents at www.fema.gov/publications-archive and www.fema.gov/media-library/assets/documents/128488, respectively. These policy and guidance documents remain in effect for incidents declared prior to January 1, 2016. The language in V1.0 is in effect for incidents declared between January 1, 2016 and March 31, 2017. The language in V2.0 is in effect for incidents declared between April 1, 2017 and August 22, 2017. The language in V3.1 is in effect for incidents declared on or after August 23, 2017. Please send questions and feedback to FEMA-PAPolicy@fema.dhs.gov.

Demonstration of Need for Mosquito Control Assistance
as a direct Result of Hurricane Florence.
(FEMA PAPPG-Appendix G: Mosquito Abatement)

APPENDIX G: MOSQUITO ABATEMENT

APPENDIX G: MOSQUITO ABATEMENT

FEMA may provide reimbursement for mosquito abatement measures at the written request of the State, Territorial, Tribal, or local public health officials after FEMA consults with the Centers for Disease Control and Prevention (CDC), based on:

- Evidence of:
  - Higher levels of disease transmitting mosquitoes in the disaster area following the event;
  - A significant number of disease-carrying mosquitoes in the area due to the increase in event-related standing water; or
  - The potential for disease transmission and human exposure to disease carrying mosquitoes based on the detection of arboviral diseases in sentinel organisms (poultry, wild birds, mosquito pools) in the impacted area prior to the storm event, discovered during surveillance as part of mosquito abatement activities, or reported human cases in which transmission occurred prior to the storm event.
- A determination that a significant increase in the mosquito population and/or the change of biting mosquito species poses a threat to emergency workers who are required to work out-of-doors, thereby significantly hampering response and recovery efforts.

  Such evidence may include an abnormal rise in landing rates or trap counts, significant changes in species composition or estimate of infection rates, when compared to pre-disaster surveillance results.
- Verification from medical facilities within the affected area that an increase in the general public's exposure to mosquitoes has directly resulted in secondary infections, especially among those with weakened immune systems such as the elderly, the very young, or the sick.

  This may occur when increased numbers of residents in disaster areas with extended power outages are forced to open buildings for air circulation.

Terminology

An arbovirus is a virus utilizing arthropods as vectors and is transmitted via their feeding to a definitive host.

The landing rate, expressed as number of mosquitoes landing per minute, is used as an adult mosquito surveillance measure utilizing human volunteers as bait.

Methoprene Briquettes are formulated with methoprene (compound that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae) growth inhibitor and a timed-release carrier that resembles a charcoal briquette.

A sentinel organism is an organism, usually fowl, purposely exposed to mosquito bites outdoors to monitor pathogen transmission by mosquitoes.

Seroconversion is the development of detectable antibodies in the blood of a sentinel organism directed against an infectious agent.

Trap count is the number of female mosquitoes captured in a trap receptacle each night the traps are set.

Where possible, a determination of the need for vector control measures should be based on surveillance data provided by local agencies, or on surveillance conducted as a component of the

emergency response. Similarly, termination of control efforts should be based on mosquito density and disease transmission monitoring, and on the degree of exposure to mosquitoes of residents and responders. Information useful in determining the need for emergency mosquito control measures includes:

- The local jurisdiction's mosquito population density estimates pre- and post-disaster, including information about species composition
- Arbovirus transmission activity indices, including information about the location of surveillance activities; indices may consist of:
  - Infection rates in mosquitoes
  - Seroconversion in sentinel chickens
  - Equine case
  - Human cases
- The amount and type of flooding (e.g., saltwater/freshwater, coastal/inland)
- The extent and location of damage to housing
- The extent, location, and anticipated duration of power interruption
- The anticipated extent and duration of cleanup and recovery operations
- A description of the type of mosquito management required (e.g., aerial or ground- based adulticide applications, larvicide applications), and duration of application to reduce the threat and the areas where the interventions are needed

To be eligible for Public Assistance (PA) funding, insecticide formulations must be among those approved and registered by the U.S. Environmental Protection Agency for use in urban areas for mosquito control, and must be applied according to label directions and precautions by appropriately trained and certified applicators. Furthermore, mosquito abatement measures must comply with all Federal, State, Territorial, and local laws, ordinances, and regulations concerning vector control. Mosquito abatement measures include, but are not limited to the following:

- Adulticiding – The ground or aerial spraying of insecticides to kill adult mosquitoes
- Larviciding – The application of chemicals, including methoprene briquettes, by ground or air to kill mosquito larvae or pupae
- Breeding habitat removal or alteration – The modification of potential breeding habitat to make it unsuitable for mosquito breeding or to facilitate larval control, including:
  - Draining or removing standing water in close proximity to homes, schools, sheltering facilities, and businesses
  - Increased dewatering through the pumping of existing drainage systems
  - Dissemination of information (e.g., inserting flyers with resident's water bills, public service announcements, newspaper campaigns) to direct residents to remove the mosquito breeding habitat

Eligibility through a demonstrated evidence of:

- Higher levels of disease transmitting mosquitoes in the disaster area following the event.
- A significant number of disease carrying mosquitoes in the area due to the increase in event-related standing water.
- The potential for disease transmission and human exposure to disease carrying mosquitoes based on the detection of arboviral diseases in sentinel organisms in the impacted area prior to the storm event, discovered during surveillance as part of mosquito abatement activities or reported human cases in which transmission occurred prior to the storm event.
- A determination that a significant increase in the mosquito population and/or the change in biting species poses a threat to emergency workers who are required to work outdoors, thereby significantly hampering response and recovery efforts.
- Verification from medical facilities within the affected area that an increase in the general public's exposure to mosquitoes has directly resulted in secondary infections, especially among those with weakened immune systems such as the elderly, the very young or the sick.

Demonstration of Increased Mosquito Activity in Brunswick County

Brunswick County Health Services

25 Courthouse Drive N.E.; Post Office Box 9
Bolivia, North Carolina 28422-0009
910-253-2250 1-888-428-4429

David M. Stanley III, Executive Director
Health and Human Services Agency

Cris Harrelson, Director
Department of Health Services

October 4, 2018

RE: Demonstration of Increased Mosquito Activity in Brunswick County

To Whom It May Concern:

As required by Appendix G of the FEMA Public Assistance Program and Policy Guide, please find enclosed evidence of increased mosquito activity in Brunswick County following Hurricane Florence. In my professional opinion, the mosquito activity presents a threat for the transmission of arboviral diseases to the human population due to the marked increase in mosquito populations (aided by the abundant rainfall during the storm and the resulting large areas of standing water) and the increase in outdoor human activity during recovery efforts.

The enclosed documentation and data were prepared by Jeff Brown, Vector Control Supervisor for Brunswick County. The enclosed documentation includes:

- Total weekly mosquito production graph;
- ILM Rainfall data set;
- Arbovirus disease activity;
- Species data sets for *Aedes aegypti* and *Aedes albopictus*;
- 2018 mosquito pooling data;
- EEE press release.

I will be glad to provide additional information upon your request. If you have any questions or concerns, please feel free to contact me at (910) 253-2298 or cris.harrelson@brunswickcountync.gov.

Sincerely,

Cris Harrelson, Director
Brunswick County Health Services

Enclosure

CC. David Stanley, Director
Brunswick County Health and Human Services

Stephanie Lewis, Director
Brunswick County Operations

Demonstration of Need for Mosquito Control Assistance
as a direct Result of Hurricane Florence.
(FEMA PAPPG-Appendix G: Mosquito Abatement)

Eligibility through a demonstrated evidence of:
Higher levels of disease transmitting mosquitoes in the disaster area following the event.

Typically, *Culiseta melanura* and associated EEE bridge vectors are collected between weeks 38-44. Additionally, standing water with rotting vegetation creates the opportunity cur Culex mosquito production. Please see the enclosed total weekly mosquito production graphed with an overall weekly average by week from 2003-2018.

The Mosquito surveillance data is collected using New Jersey light traps baited with light only. There are three traps, one each in the southern, central and northern parts of the county. The data is collected daily 365 days a year. The daily data is then converted to weekly and monthly totals that can be easily overlaid with the daily weekly and monthly rainfall data collected from the weather stations we monitor. All of the traps lost a few days of data collection from the power outages during the storm. All three traps have been repaired and are again collecting daily data.

A significant number of disease carrying mosquitoes in the area due to the increase in event-related standing water.
Southeast North Carolina has set a new historic record for annual rainfall. See the enclosed rainfall data sets. Complicating the weather rainfall from Hurricane Florence is the fact that Wilmington (ILM) already had 42.05 inches of precipitation from weeks 20-31. While weeks 32-36 had very little rainfall. This favors flood water mosquito production due to the wet-dry cycle that causes flood water mosquitoes to proliferate. The rainfall data set includes weekly data for Wilmiongton, NC. However, data sets for Fayetteville NC, Florence SC, Lumberton NC, and North Myrtle Beach SC is also available upon request. Weekly data sets range from 2002 through 2018. All of the listed data sets have a correlation to mosquito control activities in Brunswick County as well as Southeast North Carolina.

The potential for disease transmission and human exposure to disease carrying mosquitoes based on the detection of arboviral diseases in sentinel organisms in the impacted area prior to the storm event, discovered during surveillance as part of mosquito abatement activities or reported human cases in which transmission occurred prior to the storm event.

Please see the enclosed Arbovirus Disease Activity. On July 17, 2018, the North Carolina State Laboratory of Public Health isolated 7 pools of mosquitoes positive for Easter Equine Encephalitis (EEE). Week 38 (Sept 17) through week 44 (November 4) exhibit increased EEE activity in the southeast corner of the state. A final consideration is the lag in reporting human disease cases requires mosquito control personnel to be extraordinarily proactive in the post disaster situations especially when Brunswick County is just entering peak arbovirus transmission for the area.

A determination that a significant increase in the mosquito population and/or the change in biting species poses a threat to emergency workers who are required to work outdoors, thereby significantly hampering response and recovery efforts.

Demonstration of Increased Mosquito Activity in Brunswick County

Emergency Medical Services operations have increased over 35% during the Hurricane Florence recovery efforts. Insect abatement is a safety issue for our crews as one has already had an anaphylactic reaction from a bee sting during a response. This type of injury as well as other nuisance insects will continue to hamper emergency response going forward.

The seasonal distribution of every mosquito species collected daily in Brunswick County from 1999 to present is tracked in the individual mosquito species data sets. These data sets should be evaluated from week 38 (Sept 17) through week 44 (November 4) to determine both increased disease risk as well as the potential for increased arbovirus transmission potentials. These data sets can be made available to you upon request.

Verification from medical facilities within the affected area that an increase in the general public's exposure to mosquitoes has directly resulted in secondary infections, especially among those with weakened immune systems such as the elderly, the very young or the sick.

Brunswick County Health Department contacted the Novant Hospital on September 23 inquiring about secondary infections from mosquito bites. None have been reported as of this time. The flood water mosquitoes emerged on September 22nd and 23rd across the county. Mosquitoes are still searching for food and a mate. We anticipate this type of information to be readily available as mosquitoes start actively start searching for blood meals.

Demonstration of Need for Mosquito Control Assistance
as a direct Result of Hurricane Florence.
(FEMA PAPPG-Appendix G: Mosquito Abatement)

Required Documentation

Mosquito population density estimates pre and post disaster including information about species composition

Daily data collection is currently ongoing. Additional field assessments will be made using Brunswick Counties NPED landing count protocols. Species data sets for *Aedes aegypti* and *Aedes albopictus* are included. However, data sets for 33 additional species can be made available to you upon request.

Arbovirus transmission activity indices

Enclosed is the Arbovirus Disease Activity in Brunswick County and the surrounding counties. Additional mosquito pooling efforts would be welcomed from the Federal Government (CDC), State of North Carolina and their university partners.

Arbovirus pooling collection protocols are beyond the scope of most local county Health Departments. Enclosed you will find the 2018 mosquito pooling records for 2018. Again 7 pools of *Culiseta. melanura* were collected on July 17, 2018.

The State Health Director, Elizabeth Tilson, M.D., MPH. issued a press release on September 20, 2018. The press release is also enclosed.

The amount and type of flooding

Hurricane Florence produced storm surge flooding (3 to 4 feet) to most of our beach front communities, fresh water flooding from rains and downstream flooding from river rise to approximately 30% of the county.

The extent and location of damage to housing

While the damage assessment process continues and there is not yet an exact number of buildings damaged, as of September 22, 2018 there have been 5,524 Brunswick County residents who have applied for FEMA assistance through the Individual Assistance program.

Extent, location and anticipated duration of power interruptions

During the height of Hurricane Florence, at one time or another, all county residents were without electricity.

The extent and duration of cleanup and recovery operations

Recovery and cleanup will be extensive and will include infrastructure repairs such as road and bridges as well as extensive residential cleanup. The initial recovery operations will last over three months and the long term recovery will take years to complete.

The type of mosquito management required and duration of application to reduce the threat and the areas where the interventions are needed.

The request is for aerial applications for mosquito control to Brunswick and the other disaster counties in North Carolina. The duration of the applications will be now through November 4th, 2018.

Exemption Letters

NCDA Aerial Exemption Request and Authorization

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September·27,·2018¶
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¶
Patrick·Jones¶
Pesticides·Division¶
NCDA&CS¶
1090·MSC¶
Raleigh,·NC·27607¶
¶
RE:·Aerial·Spraying·in·Brunswick·County¶
¶
Vector·Disease·Control·International·(VDCI)·will·be·conducting·an·aerial·mosquito·control·spray·mission·over·congested·areas·of·Brunswick·County·for·the·control·of·vector·carrying·mosquitos.·VDCI·has·a·contract·with·the·Brunswick·County·Department·of·Operations·to·conduct·this·operation·using·the·pesticide·Dibrom·EC·which·is·labeled·to·spray·over·congested·areas.·The·operation·will·commence·on·October·1,·2018·at·7:00·pm·to·7:00·am.·¶
¶
The·mission·will·be·conducted·with·two·twin·engine·Aztecs·using·rotary·atomizer·to·maintain·the·proper·droplet·spectrum·of·25·to·30·microns.·The·operation·will·be·flown·at·an·altitude·of·300·ft·AGL·at·night.·The·night·time·operation·will·ensure·the·best·kill·of·the·target·pest·and·the·minimum·impact·on·the·non-target·pests.·¶
¶
·If·you·have·any·questions·or·concerns,·please·feel·free·to·contact·me·at·(910)·253-2298·or·cris.harrelson@brunswickcountync.gov.¶
¶
Sincerely,¶

YC Harrelson ¶
Cris·Harrelson,·Director¶
Brunswick·County·Health·Services¶

Steve Troxler
Commissioner

North Carolina Department of Agriculture
and Consumer Services
Structural Pest Control and Pesticides Division

James W. Burnette, Jr.
Director

September 27, 2018

Mr. Cris Harrelson,
Director
Brunswick County Health Services
P O Box 9
Bolivia, N C 28422

Dear Mr. Harrelson:

We have received your notice of September 27, 2018 for an exemption to conduct a control operation for the control of pests of public health significance as required by 2 NCAC 9L .1006(4). The notice is in compliance with the requirements of the rule. Please remember that all applications shall be in compliance with label requirements.

If you have questions, please contact this office.

Sincerely,

James W., Burnette, Jr.
Director, Structural Pest Control and Pesticides Division
Secretary, N C Pesticide Board

cc: N. C. Pesticide Board
Patrick Jones
Jason Williams

1001 Mail Service Center, Raleigh, North Carolina 27699-1001
(919) 733-6100 ● Fax (919) 733-0633 ● www.ncagr.gov/SPCAP
TTY: 1-800-735-2962 Voice: 1-877-735-8200
An Equal Opportunity Employer

Letter of Authorization for VDCI

Brunswick County
Operation Services Department
Stephanie Lewis, Director

Construction & Grounds
Building & Park Maintenance
Custodial Services

PO Box 249
Bolivia, NC 28422
(910) 253-2515
www.brunswickcountync.gov

Solid Waste & Recycling
Mosquito & Water Management
Service Center

October 1, 2018

Vector Disease Control International
Attn: Malcom Williams, Aerial Division Manager.
PO Box 566
Dewitt, Arkansas 72042

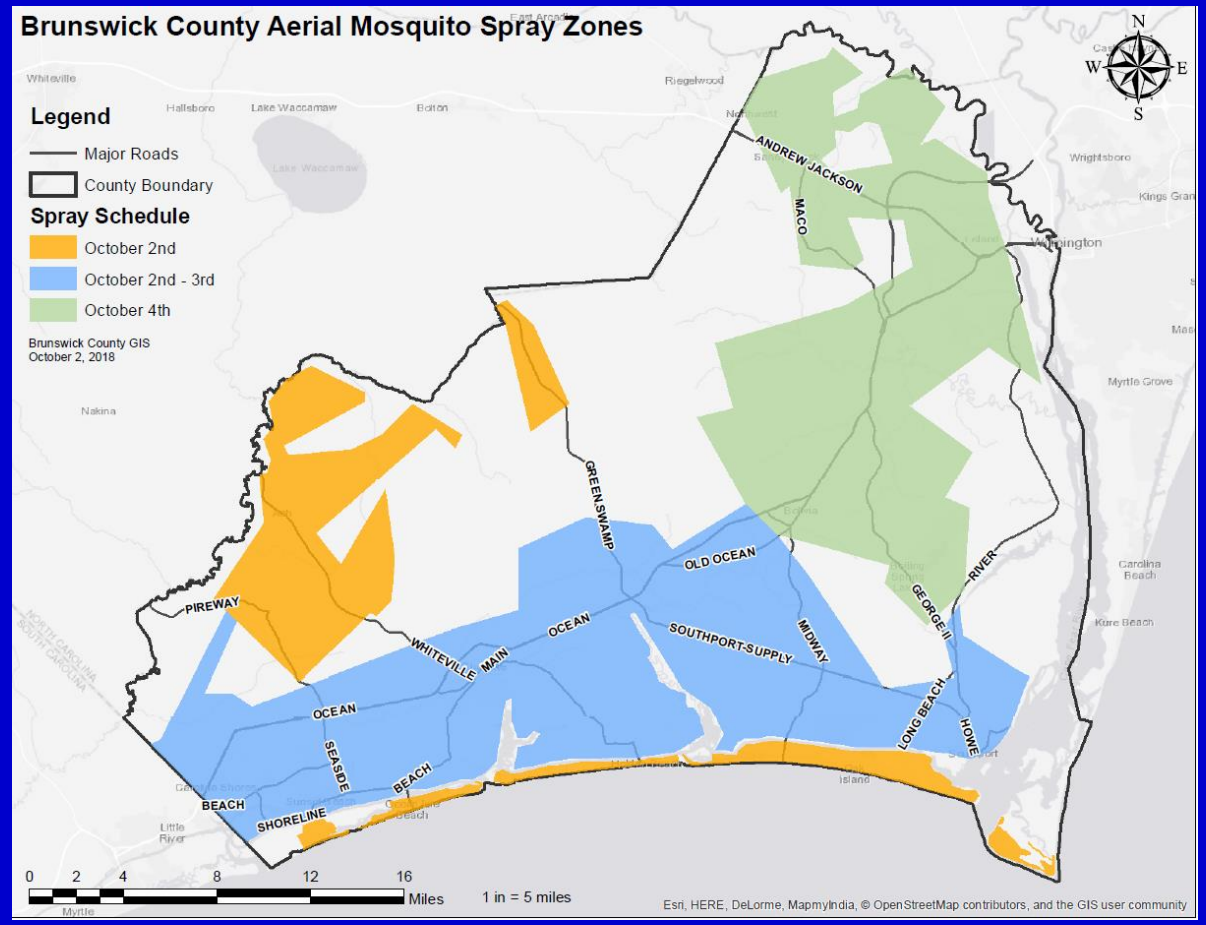
Dear Vector Disease Control International:

I, Jeffrey Brown, serving as Vector Control Supervisor for Brunswick County Mosquito Control, in the State of North Carolina, hereby authorize Vector Disease Control International to apply insecticides approved and labeled for mosquito control use over congested areas of Brunswick County by low flying aircraft, for the contract period of October 1·2018- October 6, 2018.

Sincerely

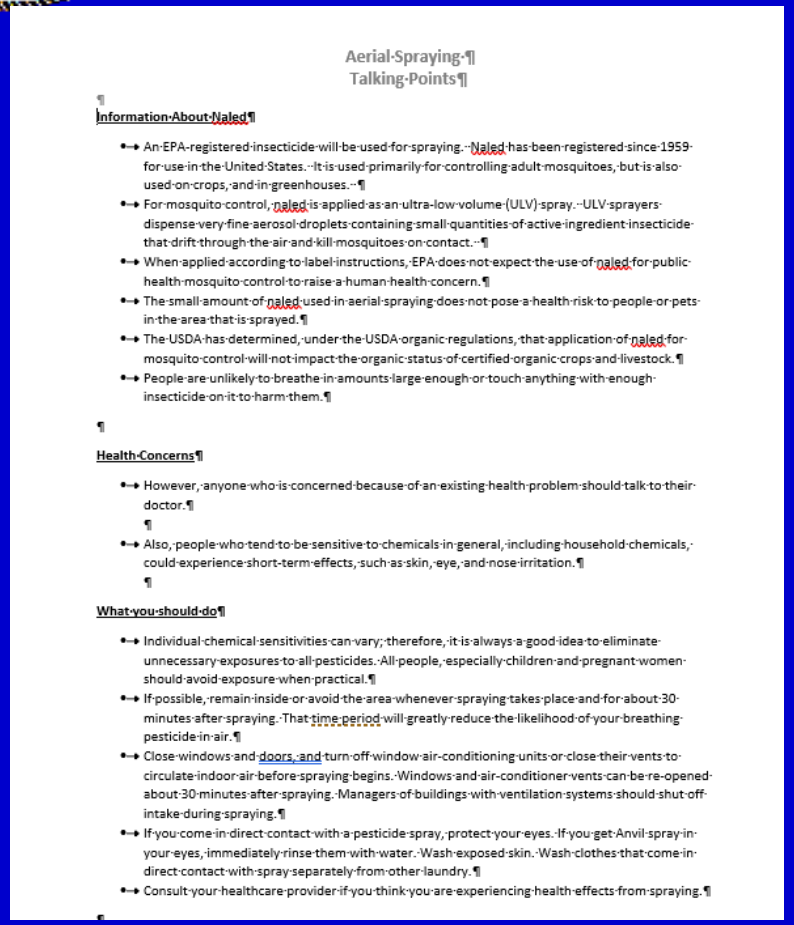
Jeffrey Brown
Mosquito Control Supervisor
Brunswick County, North Carolina.

Brunswick's Aerial Treatment Areas



Pre Treatment Public Notices

Chemically Sensitive People Talking Points



Aerial Spraying
Talking Points

Information About Naled

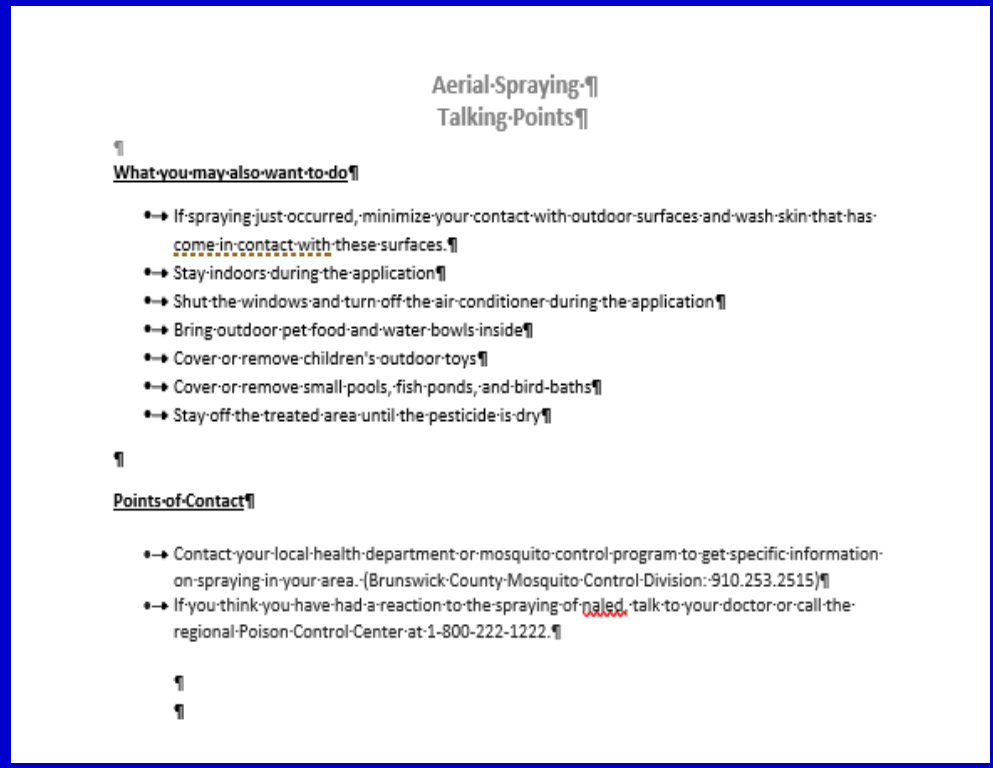
- An EPA-registered insecticide will be used for spraying. Naled has been registered since 1959 for use in the United States. It is used primarily for controlling adult mosquitoes, but is also used on crops, and in greenhouses.
- For mosquito control, naled is applied as an ultra-low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets containing small quantities of active ingredient insecticide that drift through the air and kill mosquitoes on contact.
- When applied according to label instructions, EPA does not expect the use of naled for public health mosquito control to raise a human health concern.
- The small amount of naled used in aerial spraying does not pose a health risk to people or pets in the area that is sprayed.
- The USDA has determined, under the USDA organic regulations, that application of naled for mosquito control will not impact the organic status of certified organic crops and livestock.
- People are unlikely to breathe in amounts large enough or touch anything with enough insecticide on it to harm them.

Health Concerns

- However, anyone who is concerned because of an existing health problem should talk to their doctor.
- Also, people who tend to be sensitive to chemicals in general, including household chemicals, could experience short-term effects, such as skin, eye, and nose irritation.

What you should do

- Individual chemical sensitivities can vary; therefore, it is always a good idea to eliminate unnecessary exposures to all pesticides. All people, especially children and pregnant women should avoid exposure when practical.
- If possible, remain inside or avoid the area whenever spraying takes place and for about 30 minutes after spraying. That time period will greatly reduce the likelihood of your breathing pesticide in air.
- Close windows and doors, and turn off window air-conditioning units or close their vents to circulate indoor air before spraying begins. Windows and air-conditioner vents can be re-opened about 30 minutes after spraying. Managers of buildings with ventilation systems should shut off intake during spraying.
- If you come in direct contact with a pesticide spray, protect your eyes. If you get Anvil spray in your eyes, immediately rinse them with water. Wash exposed skin. Wash clothes that come in direct contact with spray separately from other laundry.
- Consult your healthcare provider if you think you are experiencing health effects from spraying.



Aerial Spraying
Talking Points

What you may also want to do

- If spraying just occurred, minimize your contact with outdoor surfaces and wash skin that has come in contact with these surfaces.
- Stay indoors during the application
- Shut the windows and turn off the air conditioner during the application
- Bring outdoor pet food and water bowls inside
- Cover or remove children's outdoor toys
- Cover or remove small pools, fish ponds, and bird baths
- Stay off the treated area until the pesticide is dry

Points of Contact

- Contact your local health department or mosquito control program to get specific information on spraying in your area. (Brunswick County Mosquito Control Division: 910.253.2515)
- If you think you have had a reaction to the spraying of naled, talk to your doctor or call the regional Poison Control Center at 1-800-222-1222.

9/29/2018 Good morning,
Attached is a spreadsheet with 15 residents that are on our "Do Not Spray List" because of medical concerns regarding mosquito spraying. If we could get someone from the Health Dept to reach out to these individuals and discuss how to avoid exposure during the aerial applications that would be great!

10/1/2018
From: Cherie Browning
Sent: Monday, October 1, 2018 12:15:30 PM
To: Cris Harrelson
Subject: RE: Citizens With Medical Concerns From mosquito spraying
Everyone on the Do Not Spray list was contacted. Everyone was very appreciative of the call. Most welcomed the spraying!!

Schools and Parks

- 9/28/2018 Messaging regarding mosquito spraying
  Jeff Brown just called and wanted some messaging to go out about the aerial spraying to the public. He wanted to limit folks being out side when the planes are flying overhead. Also youth sporting events should be notified. Can you work with the schools and parks individually in case their are youth sports activities such as football practice.. The spraying will start Monday so the messaging needs to go out today. Please work on a draft for Jeff.
- David Stanley

- 10/1/2018
  Daniel. PIO For Brunswick County Schools
  Here are the areas scheduled for aerial mosquito spraying this evening, beginning at approx dusk to 10:30 pm. I am sharing this information so that you can advise all school-related activities scheduled in this area to take precautions during the time of spraying. I have also attached some talking points on specific precautions that should be taken during the 10/1/2018 spraying. If you have any questions, please do not hesitate to contact me.

  Cris Harrelson, Director
  Brunswick County Health Services

Questions