

**STATEMENT OF FINDINGS:
NEW YORK CITY DEPARTMENT OF HEALTH
ADULT MOSQUITO CONTROL PROGRAMS**

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A. INTRODUCTION

This Statement of Findings has been prepared in accordance with the environmental review requirements of Article 8 of the New York State Environmental Conservation Law, the State Environmental Quality Review Act (SEQRA), as set forth in Section 617.11 of its implementing regulations, and the New York City Environmental Quality Review (CEQR) process as set forth in Executive Order 91 as amended. This Statement of Findings has been prepared to demonstrate that 1) the procedural requirements have been met; 2) the proposed *Adult Mosquito Control Programs* were selected from among reasonable alternatives; and 3) the potential for adverse environmental effects as disclosed in NYCDOH's *Adult Mosquito Control Programs* Environmental Impact Statement (EIS) and during the review process will be avoided or minimized to the extent practicable by the incorporation of mitigation measures and other project components.

Under CEQR, the New York City Department of Health (NYCDOH) is the lead agency responsible for conducting the environmental review that determines whether the proposed action would have significant impacts on public health and the environment.

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A Draft Scope of Analysis was issued on May 18, 2000 that set forth the analyses and methodologies proposed for the EIS. The public, governmental agencies, community boards, and elected officials were invited to comment on the Draft Scope of Analysis either in writing or at the public scoping meetings held on June 19, 2000 (afternoon and evening sessions in Manhattan), June 20, 2000 (Staten Island), June 21, 2000 (Bronx), June 22, 2000 (Brooklyn) and June 23, 2000 (Queens). The comment period on the Draft Scope of Analysis remained open until July 14, 2000. The comments received during the comment period were incorporated into the Final Scope of Analysis, which was issued in December 2000.

The Draft Environmental Impact Statement (DEIS) was certified as complete on May 10, 2001 and was published and distributed for public review. The certification of the DEIS was followed by a series of public hearings, which were held in all five New York City boroughs on May 29, 2001 (Manhattan and Queens), May 30, 2001 (Bronx and Staten Island), and May 31, 2001 (Rockaways, Queens and Brooklyn). Notices of the DEIS availability as well as the dates and locations of the public hearings were advertised in the New York Post, the City Record and the Environmental News Bulletin, and were mailed to the local community boards and elected officials. Approximately 105 copies of the DEIS and 150 copies of the DEIS Executive Summary were distributed to various City, State and Federal agencies, the five New York City Borough Presidents' Offices, all New York City Community Boards, and elected officials. Comments on the DEIS were received at the six public hearings or were submitted in writing to NYCDOH through June 11, 2001, the close of the public comment period. NYCDOH prepared a Final Environmental Impact Statement (FEIS), which addressed all substantive comments made on the DEIS. Written comments on the DEIS that were received by NYCDOH after June 11, 2001, from the New York State Department of Health (NYSDOH) were also addressed in the FEIS. The FEIS was certified as being complete and a Notice of Completion was issued on July 12, 2001.

After considering the FEIS for no less than 10 days after issuance of the Notice of Completion, NYCDOH has adopted this Statement of Findings.

B. PROJECT OVERVIEW

NYCDOH, in consultation with the NYSDOH, the U.S. Centers for Disease Control and Prevention (CDC), and other Federal, State and local agencies and entities, is implementing a *Comprehensive Arthropod Surveillance and Control Plan (Comprehensive Plan)*. One of NYCDOH's long-term goals is to prepare for the prevention and control of all arthropod-borne diseases that pose a threat to public health. Therefore, the *Comprehensive Plan* will attempt to prevent the infection of humans from pathogens (i.e., any disease-producing organism) carried by arthropods in New York City. The resultant diseases include, but are not limited to, encephalitis and meningitis caused by the West Nile virus. NYCDOH's immediate priority is to prepare for, and take preventive measures to reduce the potential for, a renewed outbreak of the West Nile virus. The *Comprehensive Plan* emphasizes routine surveillance and control of potential mosquito breeding sites to prevent adult mosquitoes from proliferating in the City. The *Comprehensive Plan* also addresses efforts to control adult mosquitoes to prevent disease throughout the City, if necessary. In addition, in response to community concerns about the

quality of life for citizens who have been subjected to unbearable populations of mosquitoes (including aggressive human-biting salt marsh mosquitoes) in the Rockaways section of Queens, the *Comprehensive Plan* will include a component to control adult mosquito populations in the Rockaways. The *Comprehensive Plan* includes the following two major components:

1. *Routine Surveillance and Control Program* (the “*Routine Program*”), focusing on:
 - Education;
 - Comprehensive surveillance; and
 - Mosquito breeding prevention and larval control activities.
2. *Adult Mosquito Control Programs*. This component of the *Comprehensive Plan* consists of two programs:
 - a) A *Mosquito-Borne Disease Control Program* focusing on control of adult mosquitoes for disease control Citywide; and
 - b) A *Mosquito Population Control Program in the Rockaways* focusing on control of adult mosquito populations in the Rockaways.

The Proposed Action is the adoption of the *Adult Mosquito Control Programs* to control adult mosquitoes that pose a threat to the public health by potentially spreading the West Nile virus and other emerging pathogens and also to control adult mosquito populations in the Rockaways. Components of this plan may be partially reimbursed by NYSDOH pursuant to State Law. Although the City is conducting extensive education, surveillance and widespread larviciding under the *Routine Program*, there is still a potential for the West Nile virus (or other mosquito-borne pathogens) to be present in and transmitted to humans by the adult mosquito population. Once these pathogens have been identified, without the *Mosquito-Borne Disease Control Program*, the West Nile virus and other pathogens causing diseases could threaten public health, causing unnecessary suffering and additional human deaths, particularly to vulnerable segments of the population. In addition, the City is also actively trying to reduce the breeding of mosquitoes in the Rockaways through the implementation of the *Routine Program*. Nevertheless, unbearable mosquito population levels may still materialize, triggering the need for the *Mosquito Population Control Program in the Rockaways*.

As a discretionary action of a City agency that may have significant adverse impacts on the environment, adoption of the *Routine Program* was subject to the State Environmental Quality Review Act (SEQRA) and City Environmental Quality Review (CEQR). The *Routine Program* focuses on certain activities to prevent the recurrence of a disease outbreak, and to reduce significantly the mosquito population throughout the City, including the Rockaways. These efforts, including public education, routine surveillance, and control of larvae, are not expected to result in any significant adverse environmental impacts and have been addressed under CEQR in a separate Environmental Assessment Statement (CEQR #00DOH-001Y). On April 12, 2000, NYCDOH, acting as lead agency for SEQRA/CEQR review, determined that the *Routine Program* would not have significant adverse impacts on public health or the en-

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vironment and issued a Negative Declaration.

Given the scope of the *Adult Mosquito Control Programs*, which could include focused and/or Citywide truck and/or aerial applications of insecticides targeted at adult mosquitoes (i.e., use of adulticides), NYCDOH determined that an EIS should be prepared and potential impacts of the potential adulticide applications should be considered before the *Adult Mosquito Control Programs* are adopted. The primary focus of this EIS is to address the use of insecticides to control adult mosquitoes. Since the *Comprehensive Plan* also includes possible adulticide spraying in the Rockaways to control adult mosquitoes, the EIS includes an assessment of the potential cumulative impacts from spraying adulticides under both program elements. It should be noted that although the proposed long-term adult mosquito control efforts to prevent a recurrence of a West Nile virus outbreak were assessed in this EIS, adulticides were used in 1999 and 2000 to prevent the spread of West Nile virus to humans. This response, pursuant to the emergency provisions of SEQRA/CEQR, occurred prior to completion of this environmental review.

C. PURPOSE AND NEED

In late August 1999, NYCDOH detected an unusual cluster of encephalitis cases in northern Queens. In collaboration with the CDC and the NYSDOH, an epidemiologic investigation was initiated that identified the cause as the West Nile virus, a mosquito-borne disease that had never before been recognized in North America. In 1999, 59 persons in the New York City metropolitan area, including 45 New York City cases, were hospitalized due to infections caused by West Nile virus. One of these 45 cases was a Canadian visitor who became ill after visiting Queens. The majority of the 59 cases were diagnosed with encephalitis. Some of the cases had meningitis without encephalitis. Five of the hospitalized cases had illness characterized by fever and headache. Seven elderly citizens, who are among the population particularly vulnerable to the effects of the West Nile virus, died, including four New York City residents. Subsequently, NYCDOH conducted a voluntary blood testing program in northern Queens, the area where most human cases were clustered, and determined that many more individuals had been exposed to the virus (2.6 percent, or 19 persons in the sample of 677), although most had experienced either mild symptoms or no symptoms at all. In 1999, the West Nile virus was identified and also found to have caused illness and death among animals, including hundreds of birds (of numerous species) in the New York City metropolitan area, horses in eastern Long Island, and a cat in New Jersey.

The virus is transmitted to humans and animals by the bite of a mosquito carrying the West Nile virus. A mosquito may become a carrier of the virus when it bites a bird, animal, or human infected with the virus. West Nile virus has been identified, as of 2000, in mosquitoes and birds in New York City, Long Island, the lower Hudson Valley, Connecticut, New Jersey, Massachusetts, Rhode Island, New Hampshire, Vermont, Maryland, Washington, D.C., Pennsylvania, Virginia, and North Carolina. The primary mosquito species identified as carriers of the virus in 1999 were *Culex pipiens* and *Culex restuans*, although another species, *Aedes vexans*, was identified as a carrier in Connecticut. Additional mosquito vectors were identified in 2000.

Once the cause of the 1999 encephalitis outbreak was recognized as a mosquito-borne disease, the City rapidly implemented mosquito control measures and a public health education campaign. The public health response at the Federal, State, and local levels was to closely monitor the extent of West Nile virus in humans, mosquitoes, and birds, in order to understand the problem, identify the disease and its causative agent and vectors (organisms that spread the disease), and institute control measures. These efforts were effective in limiting the impact of the outbreak. As a result of these rapid planning, coordination, and implementation efforts, the overall number of human cases in 1999 was relatively low compared to similar outbreaks worldwide. Although NYCDOH's emergency response was effective, the unprecedented disease event highlighted the City's need to strengthen the infrastructure for arthropod-borne as well as emerging infectious disease surveillance.

NYCDOH's decision to develop and maintain a *Comprehensive Plan* is underscored by two factors:

- Encephalitis caused by West Nile virus may reappear in the future due either to infected migratory birds or to infected mosquitoes that overwinter (the latter was proven to occur with the discovery of infected overwintering mosquitoes in February 2000 in northern Queens, and with the reappearance of West Nile virus in the summer of 2000).
- West Nile virus is not the only mosquito-borne pathogen or new infectious disease threat to face the City. The West Nile outbreak highlighted the City's potential vulnerability to imported disease threats as well as the ongoing need to maintain a strong public health infrastructure that can quickly identify new infectious diseases in the City.

Adulticide applications under the *Adult Mosquito Control Programs* are expected to be intermittent, and the adulticides are expected to have a relatively low persistence in the environment. The analyses of the potential impacts from the Proposed Action in the EIS are intended to address the concerns raised with respect to adulticide applications.

In addition to learning of the emergence of the West Nile virus in New York City in 1999, NYCDOH has been made aware of community concerns about the quality of life for citizens in the Rockaway Peninsula who have been subjected to an unbearable population of aggressive biting salt marsh mosquitoes.

The Rockaway Peninsula is bounded by the Atlantic Ocean on the south and Jamaica Bay (Rockaway Inlet and Beach Channel) to the north and west. The western end of the peninsula is part of the federally owned Gateway National Recreation Area. The peninsula is home to a wide array of plant and animal species and consists of some of the most ecologically significant saltwater marshes on Long Island. Over the years, development and filling of marshlands, along with other types of ecological degradation, have restricted the natural flushing of the saltwater marshes and contributed to an increase in artificial habitat for *Ochlerotatus (Oc.) sollicitans* (the major aggressive human-biting mosquito in the Rockaways) as well as other species of mosquitoes (NYCDOH data, 2001).

To correct this ecological degradation, the New York District of the U.S. Army Corps of Engineers has tentatively scheduled habitat restoration efforts in Bayswater State Park, Dubos

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Point, and Brant Point. Improvements are slated to begin in 2003 and will include construction of offshore breakwaters to accelerate the establishment of fringe salt marshes, removal of a damaged seawall, extending and/or unclogging tidal creeks to promote the free flow of salt water, removing unwanted vegetation, and fencing to prevent excessive drifting of sand.

This restoration will contribute to mosquito control because increased tidal movement will allow fish to enter previously inaccessible areas close to shore where they can feed on salt marsh mosquito larvae. It will also disrupt the mosquito life cycle because mosquito larvae must have standing water to survive. However, given the immediate concern about health and well-being, NYCDOH's Office of Vector Surveillance and Control is committed to reducing the mosquito population of the Rockaway Peninsula so that a reasonable quality of life (e.g., permitting residents to sit outdoors or enjoy recreation at night) is restored.

D. PROPOSED ACTION

As discussed above, in addition to the *Routine Program*, NYCDOH's *Comprehensive Plan* includes the *Adult Mosquito Control Programs*, defined as the Proposed Action for the EIS. The *Adult Mosquito Control Programs* consist of two components:

- A Mosquito-Borne Disease Control Program; and
- A Mosquito Population Control Program in the Rockaways.

The goals of the *Adult Mosquito Control Programs* are:

- To protect New York City's residents, workers, and visitors from a recurrence of a West Nile virus outbreak (or other mosquito-borne disease outbreaks that might occur in the future);
- To protect the environment from the potential adverse effects from the application of adulticides, should all of the preventive efforts under the Routine Program prove ineffective; and
- To control the adult mosquito population in the Rockaways.

A number of application mechanisms, including backpack, all-terrain vehicles (ATVs), truck, or aerial spraying, may be used to apply adulticides. Federal and New York State laws require that insecticides (both larvicides and adulticides) are registered and that labels are provided for each product. As mandated under Federal and New York State law, all insecticide label directions, precautions and restrictions must be followed. Appendix 1 of the FEIS provides the labels and Material Safety Data Sheets (MSDSs) for the adulticides under consideration for community-scale applications. In the event that spraying of adulticides becomes necessary, the City will monitor for adverse environmental and human health effects of the spraying.

Mosquito-Borne Disease Control Program

One of the goals of the *Mosquito-Borne Disease Control Program* is to protect public health by reducing the potential for the amplification of viruses in mosquitoes that have been identified as vectors of human disease. The Proposed Action is one component of an integrated pest management program that NYCDOH has proposed to prevent and reduce human health risk

from mosquito-borne diseases.

The *Mosquito-Borne Disease Control Program* is based on the latest understanding of the transmission of West Nile virus and other emerging mosquito-borne pathogens, and the threat of diseases to the residents and workers of New York City from such pathogens. Given the recent outbreak of West Nile virus in the region, the science of surveillance for determining the optimum methods for deciding when to adulticide in a given year is still under development. NYCDOH will continue to stay up to date on the latest research with respect to the unfolding new science of amplification of West Nile virus (and other mosquito-borne diseases).

The comprehensive vector, bird and human data collected in 2000 have allowed NYCDOH to develop more sensitive surveillance criteria for determining the level of West Nile viral activity in birds and mosquitoes that indicates a significant risk for a human outbreak. In 2001, NYCDOH will monitor these indicators on a Citywide basis to identify areas at risk for human transmission.

NYCDOH has developed guidelines for a phased response to surveillance findings. Because there is recent historical evidence of West Nile virus, it is possible that New York City will experience a recurring outbreak of arboviral encephalitis in the future. Therefore, NYCDOH is conducting citywide enhanced surveillance, public education, and mosquito breeding prevention activities. Sporadic West Nile virus findings will trigger more intensive community-specific surveillance, public education, source reduction, and larviciding. Close tracking of dead bird reports will allow the City to further prioritize for enhanced control activity in those areas of the City where there is early evidence of recurrence of the virus. Evidence of dead bird clusters will prompt increased testing of birds and additional mosquito pool collections and testing in conjunction with intensive preventive control measures (e.g., larval source reduction and larval control).

Further evidence of increasing West Nile viral activity at a level to be of significant human health risk, despite aggressive preventive measures, will trigger the consideration of adult mosquito control, especially in nearby green areas (e.g., parks, cemeteries, golf courses, etc.) where amplification of the virus as a result of mosquito/bird transmission is most likely. Indicators that will be monitored include the overall number or clustering of dead birds reported, the positivity rates among dead birds and mosquitoes tested for West Nile viral infection, and escalating mammalian cases. Positive viral tests in bridge vectors (mosquitoes that serve as a main transmission of virus between birds and humans) will be of particular concern.

NYCDOH will work closely with Federal and State partners to assess the risk of an outbreak of human disease and the need to apply pesticides in a limited and targeted area to control adult mosquitoes by considering habitat; time of year; weather conditions; the level of documented virus; the distribution, density, age, and infection rate of the vector population; and the density and proximity of human population.

If an outbreak were in progress—with multiple confirmed cases in humans and conditions that favor continued transmission—adult mosquito control for a larger area of the city would be considered.

If the threat of human illness makes spraying necessary:

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- Spraying will be concentrated in areas most at risk for disease occurrence.
- Adulticiding will be conducted by applicators meeting USEPA and NYSDEC requirements. As part of the *Mosquito-Borne Disease Control Program*, NYCDOH is proposing to maintain a 100-foot buffer around open waterbodies during application of adulticides by truck and a 300-foot buffer around waterbodies during application of adulticides by means of aircraft.
- The City will continue to review available information on the health impact of pesticides. Any pesticide will be applied in compliance with City, State, and Federal laws and regulations.
- The public as well as City agencies with nighttime workers that could be exposed to adulticides will be notified of spray schedules in advance, which should allow sufficient time to take any necessary precautions to reduce pesticide exposure.
- Hospitals will be notified regarding the spraying schedule and information on the pesticide that will be used will be provided to the public and to physicians and other health-care providers.
- NYCDOH will monitor and assess control activities for any potential environmental and health effects through several measures, including pre- and post-spray environmental sampling and addressing pesticide exposure complaints received by NYCDOH.
- For quality assurance purposes, it is the intention of NYCDOH to contract with a qualified contractor, independent of the vendor applying pesticide, to assist NYCDOH in assuring that the technical elements of pesticide application are conducted according to plan and pursuant to applicable regulations.

Mosquito Population Control Program in the Rockaways

In response to community concerns about the quality of life for citizens in the Rockaways, NYCDOH has prepared, under the long-term *Comprehensive Plan*, the *Mosquito Population Control Program in the Rockaways*.

NYCDOH has received substantial correspondence and reports regarding the unbearable infestation of mosquitoes in the Rockaways during the summer months.

Individual residents, representatives of home owner associations, and elected officials including members of Congress, the State Assembly, City Council members, local community boards and the Queens Borough President have reported that large numbers of biting mosquitoes result in residents limiting outdoor recreation and routine activities. For example, it has been reported that, at times during the summer, sitting in yards, holding little league practice, attending outdoor parties and barbecues, gardening, playing outdoors, and enjoying area parks are not possible due to the presence of biting mosquitoes.

It should be noted that the primary salt marsh mosquito present in the Rockaways, is not currently considered a vector for West Nile virus. The goal of the *Mosquito Population Control*

Program in the Rockaways is to minimize the detriment to quality of life for residents and visitors to the Rockaways from large uncontrolled populations of mosquitoes.

This program contains elements under both the *Routine Program* and the *Adult Mosquito Control Programs* of NYCDOH's long-term *Comprehensive Plan*. To consider all Rockaway-specific plan elements in one document, NYCDOH has combined these elements from both programs (*Routine Program* and *Adult Mosquito Control Programs*) into the recently published *Mosquito Population Control Program in the Rockaways, 2001*. Although this program name is used to describe the Rockaways' specific aspects of both programs, for the purposes of this EIS, the *Mosquito Population Control Program in the Rockaways* refers to the *adult* mosquito control portion only.

The elements of this program include the following:

- NYCDOH will carry out strategic applications of adulticides when necessitated by high numbers of mosquitoes in traps placed throughout the Rockaways Peninsula; and/or on receipt of a pattern of complaints from the public that indicates unacceptably high levels of biting activity, which can be subsequently documented by NYCDOH staff.
- If adult mosquito control becomes necessary, it will be scheduled when mosquitoes are most active (between dusk and dawn) and weather conditions are conducive to spraying.
- Adult mosquito control will be conducted in a hierarchical manner depending on the acreage involved and expected effectiveness of spray operations. With the program's emphasis on surveillance and targeted control measures, NYCDOH expects to apply adulticides to specific localized areas of the Peninsula via a truck mounted with a cold aerosol generator.
- Information about adulticide spraying days and times will be released 48 hours in advance through the media, the NYCDOH Web site and West Nile Virus Information Line and pertinent City and community organizations.
- NYCDOH will monitor and assess control activities for any potential environmental and health effects through several measures, including pre- and post-spray environmental sampling, and addressing pesticide exposure complaints received by NYCDOH.

The *Mosquito Population Control Program in the Rockaways* will not be implemented at Breezy Point or on any other Federal- or State-owned properties, in order to minimize the potential impacts to endangered species in these areas. With respect to the Rockaway Beach area, the City would minimize impacts by maintaining at least a 100-foot setback from the landward edge of the dune habitat where such breeding habitats have been identified.

The Dubos Wildlife Sanctuary, administered by the New York City Audubon Society, and the Bayswater Point State Park, a State-owned land, would also not be sprayed with adulticides as part of the *Mosquito Population Control Program in the Rockaways*.

E. REQUIRED APPROVALS

After the issuance of the FEIS, NYCDOH in consultation with NYSDEC determined that NYCDOH would apply for an Environmental Conservation Law Article 24, Freshwater Wetlands permit for adulticiding activities that may need to take place in the dry portions of regulated wetlands.

F. PROBABLE ADVERSE IMPACTS AND MITIGATION

The EIS analyzes the potential cumulative environmental effects of the Proposed Action on land use, community facilities, public policy and zoning; public health; natural resources; water supply; water quality; infrastructure; hazardous materials; socioeconomic conditions; open space; cultural resources; visual resources; transportation; air quality; noise; waterfront revitalization program policies; energy; and growth inducing aspects. The analysis in the EIS concludes that the Proposed Action is unlikely to result in adverse impacts related to land use, community facilities, public policy, and zoning; water supply; infrastructure; hazardous materials; socioeconomic conditions; open space; cultural resources; visual resources; transportation; air quality; waterfront revitalization program policies; energy; and growth inducing aspects. However, the analysis presented in the EIS discloses that the proposed action may have potential adverse impacts on public health, natural resources, water quality, and noise, which are discussed below.

Public Health

All of the active ingredients and certain inert ingredients in the adulticides studied have been linked to skin and eye irritation in humans. There would be potential adverse skin and eye irritation impacts on people directly exposed to these adulticides who are sensitive to the active and inert ingredients. These adverse effects could occur among workers and residents who are directly exposed to the adulticides, especially due to direct contact near the point of application. While these potential adverse impacts would be reduced by public information announcements (both in the media and by police vehicles escorting ground applications), it is assumed that not all of the population would be able to avoid direct contact with the adulticides, and, therefore, this would result in potential unavoidable adverse impacts from skin and eye irritation.

Among a minority of persons in the general population, exposure to the adulticides evaluated in this EIS could result in minor, short-term, self-limiting symptoms including eye and nose irritation and/or respiratory symptoms from the Proposed Action. Long-term non-cancer health effects were determined to be unlikely, and the risk associated with long-term exposure to piperonyl butoxide (PBO) from the Proposed Action is considered to be negligible.

The likelihood of symptoms would be increased for people who are directly exposed, such as those individuals who are accidentally directly sprayed. As with other exposures that could potentially have adverse effects, reducing exposure is of prime importance. Every precaution would be taken to prevent such occurrences. NYCDOH would make every reasonable effort to keep the public informed about the schedule for applying the pesticides, so that sensitive persons and the general public can take appropriate precautions to prevent exposure. Spraying would generally be done in the late evening hours, and announcements would be made preceding the vehicles as a warning to people who might be in the immediate area.

Therefore, from evaluation of the results of the three public health analyses performed for the EIS, it was determined that no significant adverse public health impacts would be expected from exposure to the adulticides when applied for the purposes of the *Adult Mosquito Control Programs* and that any effects would likely be less than those of West Nile virus.

The analysis relies on the universe of information available (such as the literature review, the results of the risk assessment and the epidemiologic and attributable risk analyses), and the precautions that would be undertaken by the NYCDOH. The NYCDOH is aware that the experiencing of symptoms by particular individuals even if for a relatively short period of time, may be considered “significant” to those affected persons. However, in determining the significance of the potential adverse impact of the Proposed Action on public health, the NYCDOH has determined that the potential adverse effects to the population from applying pesticides would not be considered significant when they are compared to the potential risk to the public health if the Proposed Action were not taken.

Natural Resources

Potential significant adverse impacts were predicted for crustaceans exposed to malathion from runoff if rain occurs shortly after applications of malathion over a large land area (such as Brooklyn and Queens which drain into Jamaica Bay). Crustaceans in Jamaica Bay, and in inlet bays that exhibit similar characteristics of limited tidal flushing and have stormwater discharge points, would potentially be impacted by malathion.

Although not expected to be significant adverse impacts, there would be predicted unavoidable adverse impacts from the application of adulticides other than malathion to aquatic life when exposed via stormwater runoff. With the projected maximum number of adulticide applications—up to 10 in the same area over a 2-month period from the Citywide program, these short-term losses in localized areas near the discharge of runoff after a rain event are not expected to reduce significantly individuals at the population level. It is expected that individuals of the same species would repopulate areas that are affected by such localized losses.

The modeling performed for the EIS is intended to yield conservative estimates of the potential active ingredient levels in the water bodies. The City would conduct monitoring for pre- and post-application of malathion in tributaries to these waterbodies should malathion be selected for application at some time in the future on the land area draining into these bays. Post-application monitoring would also be conducted if it rained within one week of the application of malathion in the sections of Brooklyn and Queens where malathion had been applied. If the measured levels of malathion are as large as those estimated for the runoff in this EIS, these impacts would occur and remain unmitigated.

If malathion is selected in the future for land areas that drain into Jamaica Bay, these impacts may be lessened, once completion of the combined sewer overflow (CSO) holding tank at Paerdegat Basin is fully constructed (which will reduce the direct discharges into the bay after rainfall).

NYCDOH may elect to apply the active ingredients in smaller droplet sizes (e.g., average mean diameter less than 30 microns) in these areas, because studies in other parts of the country

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have shown that smaller droplet sizes substantially reduce the amount of the active ingredient that reaches the ground and, therefore, less would run off if a rain event occurs after the application. Also, application by aircraft with smaller droplets would also reduce the potential for runoff into such inlet bays.

There would also be some adverse impacts and loss of non-target insects and other terrestrial arthropods from all of the active ingredients as a result of the proposed *Mosquito-Borne Disease Control Program*, and these potential adverse impacts are considered to be unavoidable adverse impacts.

Water Quality

The predicted exceedance of the malathion water quality standard after rain events in runoff from large land areas to tidal creeks would also be an unavoidable adverse impact, as would the predicted exceedance of the malathion water quality standard in Jamaica Bay and similar inlet bays with stormwater outfalls and limited tidal flushing. These impacts were predicted if a large area of the drainage basin is subjected to adulticide applications, and rain occurs after the applications. As discussed under Natural Resources above, these predicted exceedances of the malathion standard result from conservative projections, and the City would monitor runoff to determine if those concentrations are observed if malathion is applied in the future.

If malathion is applied under this program to large land areas which drain to inlet bays, water monitoring of the runoff to such bays would be performed to determine whether the conservative estimates of malathion predicted in the runoff would occur. If the monitored levels are as great as those predicted, this would result in an unavoidable adverse impact.

Noise

Potential significant adverse noise impacts from either low flying aircraft (which would not be included in applications of adulticides on the Rockaway Peninsula) or truck application of adulticides with police warning announcements in front of the trucks are expected.

Potential significant adverse impacts were predicted from aircraft and police escort/truck operations. At the quietest of locations in New York City, there would be a readily noticeable and predicted significant increase in noise levels. However, both in quiet and even in relatively noisy neighborhoods, peak passby aircraft noise levels during spraying operations would be noticeable, and produce intrusive short-term noise levels at residences. These impacts would result from relatively low flying aircraft, which would have to fly at limited heights (100 to 300 feet) in order for the adulticides to be effective. Therefore, such impacts could not be mitigated.

In addition, each truck would be escorted by a police vehicle with an announcement to warn people about the spraying. This warning vehicle's purpose is to produce announcements that the public can hear, and therefore it will produce short-term noise levels that are noticeable and may be considered to be intrusive. At the quietest of locations, the truck applications with police escort would result in readily noticeable changes in noise levels, which would be a significant adverse impact. More importantly, when the police warning vehicle announcing the spraying and the spray truck pass, both in quiet neighborhoods and even in neighborhoods that are not particularly quiet, they will produce short-term passby noise levels that are likely to be

noticeable and intrusive to residents. Since the function of the police warning announcement is to make the public aware and minimize potential direct impacts on the public, the noise impacts from such operations would not be mitigated.

G. ALTERNATIVES

The EIS addresses alternatives to the proposed *Adult Mosquito Control Programs* which were either initially considered by NYCDOH or suggested during the public scoping process. One of the goals of the *Adult Mosquito Control Programs* is to protect public health by reducing the potential for the amplification of viruses in mosquitoes that have been identified as vectors of human diseases. The Proposed Action is one component of an integrated pest management program that NYCDOH has proposed to prevent and reduce human health risk from mosquito-borne diseases. NYCDOH has proposed adulticiding in a timely response to surveillance data to help achieve the control of adult mosquitoes carrying viruses known potentially to harm humans. The alternatives were evaluated in comparison to the *Adult Mosquito Control Programs*, including the capability of such alternatives to provide a quick and effective response to control adult mosquitoes in portions of the City (or the whole City) where surveillance has indicated a potential threat to public health or to the quality of life of residents of the Rockaways.

Based on examination of the available literature and information/experience supplied by mosquito-control experts, using any of these alternatives alone is unlikely to control mosquito vectors of disease efficiently and effectively. In many cases, they do not provide the flexibility to reduce significantly the adult mosquito population at numerous potential geographic locations in a sufficiently short period of time after surveillance data indicate a threat to public health or to the quality of life of residents of the Rockaways. Adulticides can be used to depress adult mosquito populations in targeted areas in an attempt to reduce significantly the number of infected adult mosquitoes, break the virus cycle of transmission and, therefore, reduce the potential for a public health threat.

Some of the alternatives may be used in addition to the application of larvicides and adulticides to supplement the effectiveness of controlling adult mosquito populations. However, in the case of a public health threat indicated via surveillance or for unbearable populations of mosquitoes in the Rockaways (including aggressive human-biting salt marsh mosquitoes), these alternative methods of control will not wholly substitute for an adulticiding plan and result in a significant reduction of adult mosquitoes.

Due to the variety of alternatives considered, the alternatives in this section were grouped into the following categories:

- No Action;
- Biological Control;
- Alternative Technologies;
- Unauthorized Programs;
- Program Alternatives; and
- Open Marsh Water Management (OMWM).

**Statement of Findings on the FEIS for NYCDOH's *Adult Mosquito Control Programs*
CEQR NO. 00DOH002Y**

The No Action Alternative considered the future condition if the *Adult Mosquito Control Programs* are not implemented and the *Routine Surveillance and Control Program (Routine Program)* continues as the complete mosquito-control program. The Biological Control Alternatives addressed biological control measures (e.g., introducing additional organisms—fish, birds, and other insects—that consume mosquito larvae or adult mosquitoes in the environment). Alternative Technologies included the installation of mechanical devices throughout the City to catch and kill adult mosquitoes (e.g., Mosquito Magnets™ and bug zappers). The Unauthorized Programs Alternative included actions to be taken by NYCDOH without obtaining the required approvals beforehand (such as applying larvicides in every potential mosquito breeding location, including private properties in New York City, or mandating the installation of window screens for every City residence). Program Alternatives consisted of alternatives that would include most of the elements of the *Adult Mosquito Control Programs*, but would add, eliminate, or change one or more of the program elements (e.g., adding adulticide applications during daylight periods, eliminating buffer zones near water bodies, including applications of new EPA and New York State registered insecticides in the future). The OMWM Alternative included altering wetlands in the City to provide circulation and flow in these habitats to eliminate potential standing-water mosquito breeding grounds.

H. CERTIFICATION OF FINDINGS

Having considered the relevant environmental impacts, facts, and conclusions disclosed in the Final Environmental Impact Statement and weighed and balanced relevant environmental impacts with social, environmental, public health, economic, and other essential considerations as required in 6 NYCRR 617.11, the NYC Department of Health certifies that the requirements of 6 NYCRR Part 617 have been met and that, consistent with social, environmental, public health, economic, and other essential considerations:

1. From among the reasonable alternatives thereto, the action to be approved is one that avoids or minimizes adverse environmental impacts to the maximum extent practicable; and,
2. The adverse environmental impacts revealed in the Final EIS will be avoided or minimized to the maximum extent practicable by incorporating as conditions to the decision those mitigative measures that were identified as practicable.

Neal L. Cohen, M.D.
Commissioner
New York City Department of Health

Date