

Suffolk County Vector Control & Wetlands Management Long Term Plan & Environmental Impact Statement



Steve Levy, County Executive

FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT

ADDENDUM (SUPPLEMENT)

Prepared for:
**Suffolk County Department of
Environment and Energy
Suffolk County Department of Health Services
Suffolk County Department of Public Works
Suffolk County, New York**

Prepared by:
CASHIN ASSOCIATES, P.C.
1200 Veterans Memorial Highway, Hauppauge, NY

January 2007



TABLE OF CONTENTS

1. Larval Dipping Techniques	1
2. Methoprene Impacts	4
3. Risk Assessment	5

APPENDIX 1 – REQUESTS FOR FGEIS CLARIFICATION

The Nature Conservancy, Nicole P. Maher, Ph.D., Wetlands Specialist	7
New York State Department of Environmental Conservation Division of Solid and Hazardous Materials Bureau of Pesticides Management, Vincent A. Palmer, Pesticide Control Specialist III	10

Subsequent to the publication of the Suffolk County Vector Control and Wetlands Management Long-Term Plan ("Long-Term Plan") Final Generic Environmental Impact Statement (FGEIS), dated October 2006, comments have been received from The Nature Conservancy (TNC) and the New York State Department of Environmental Conservation (NYSDEC), indicating that some of the FGEIS responses warrant additional clarification (see Appendix 1). Comments are summarized, and responses are provided, as follows.

1. Larval Dipping Techniques

Comment:

In relation to the FGEIS Section 4.4.1 (larval dipping techniques), the Nature Conservancy submitted the following comment:

"The plan should further clarify the thresholds and criteria used to initiate the application of larvicide. The Nov 6 2006 update of the SCVC and Wetlands Management LTP has been expanded to include an extended description of the larval sampling program however as far as I can see that text does not explicitly state that the threshold for treating marshes with larvicide is an average of 0.2 mosquito larvae per sample. The plan should specifically document the modifications from the standardized sampling protocols that they cite as reference for their larval surveillance. The plan should also indicate the implementation of regular staff training to assure an appreciation for the necessity of strict adherence to the protocol in order to produce reliable and trustworthy data."

Response:

A) The TNC concern that the "text does not explicitly state that the threshold for treating marshes with larvicide is an average of 0.2 mosquito larvae per sample" is based on a misunderstanding of the sampling program. There is no set threshold number of larvae/dip for the routine, operational sampling of the thousands of larval habitats sampled by Vector Control each season. For this work, a presence/absence measure is used, and a targeted sampling approach is taken. There are numerous reasons for not setting a specific threshold for this part of the program. The primary one is that an appropriate threshold for a given site depends on many factors that vary greatly from site to site. These factors include such things as species involved, size of the larval habitat and proximity to human habitation. For instance, a high threshold for treatment could be used for a site that is small, produces mosquitoes that do not fly far and/or are poor vectors or not aggressive biters, especially if the site is far from human habitation. A site with the opposite characteristics should have a low threshold for treatment. It would not be possible to set a threshold or series of thresholds that would be widely applicable to the many sites in which the field crews work on a routine basis because these factors vary widely from site to site. In addition, the uneven distribution of larvae in the habitat and other sampling difficulties present great difficulties in setting up sampling schemes that would generate statistically meaningful larvae/dip measurements for the wide variety of larval habitats found in the County's wetlands. The threshold of 0.2 larvae/dip used at the National Wildlife Refuges is Refuge-specific and based on data from the Refuges, and may or

may not be applicable to other wetlands. It would be useful to make more widespread use of treatment thresholds, but few places have been sampled as intensively and consistently as Wertheim and Seatuck, so in most cases, the data is not there to set an appropriate number.

- B) In evaluating the treatment criteria for the routine, operational program, it is important to recognize that the presence of larvae at a site is considered in a larger context. Most sites that are treated have been previously identified as having a history of creating mosquito problems, based on the program's decades of experience. In addition, crews operate primarily in areas with a long history of mosquito problems due to such factors as human population density and the presence of wetlands and other larval habitats near or within the community. The sites they visit routinely are prioritized when their routes are mapped out at the start of the field season, because the program will never have the resources to treat every source in the County, and treatment of every source is not necessary. Larval control crews also seek out mosquito sources in response to citizen complaints or are directed by supervisory staff to conduct control in an area as a result of viral or adult mosquito surveillance. When sites are selected for sampling and possible treatment in the routine program, there is a context that indicates the presence of larvae at the site most likely represents a problem worth treating. Sites where the mere presence of larvae may not require treatment because of their remoteness from people, presence of listed species or other factors are largely weeded out long before a crew is ever sent, in order to make best use of the County's limited resources. A good example would be some of the red maple swamps in Manorville, especially in the early season. While these swamps can produce *Aedes canadensis* in abundance, that species usually does not disperse out of the swamp to cause a biting problem and are usually most abundant in the early season where there is minimal viral activity. In addition, these swamps often have listed amphibian species that the Division avoids, and are sparsely populated. For this reason, the program does not normally target these swamps for treatment.
- C) The County has provided information to TNC describing the regular and ongoing training programs for field crews and sent links to some of the Rutgers University guidance used in crew training. Staff follows the field sheets and standard procedures they learned in training, plus the manuals from Rutgers. Examples of Rutgers manuals can be found on the following websites: <http://www-rci.rutgers.edu/~insects/dipping.htm> and <http://www-rci.rutgers.edu/~insects/larvsurv.htm>. Refresher training on larval dipping will be incorporated as part of regular training. In addition, Cornell Cooperative Extension conducts regular training of Division staff as part of the pesticide licensing process. The County has also sent examples of field sheets and the type of information they collect. The field sheets guide the field crew through its routine in order to ensure consistent sampling. The techniques used in Suffolk County are similar to those used by many other mosquito control programs and are essentially industry-standard. In the County's routine work in larval habitats, crews actively search for larvae in order to determine whether a site is the source of a mosquito infestation. This is a form of "targeted sampling" and is a time-honored and appropriate way for an operational program to seek out and control mosquitoes in the larval stage, in order to prevent infestations of adults. While larvae/dip and number of dips is recorded, it would be inappropriate to use analytical tools based on random sampling on this information, because the dips are not taken randomly, they are targeted. In setting priorities for wetlands management, it is useful for general planning and site identification purposes to know how

often a site produces mosquitoes and roughly how intense that production is. The information from the routine program can be used in a very general (non-statistical) way for that purpose, provided it is understood that this information is preliminary, not a random sample, and must be followed up with more sophisticated techniques. The County is always looking for ways to improve the way it operates in the field, and is exploring the use of more rigorous and standardized ways of making treatment decisions that still lend themselves to routine use. It would not be wise to enshrine a particular dipping protocol in great detail in the FEIS, because that could inhibit implementation of improved methods. The current description of how the County proposes to operate allows an appropriate analysis of the likely impacts of the program on the environment and how treatment decisions are made.

- D) Larval surveys are not the only means used to evaluate the effectiveness of the larval control program. The purpose of the program is to reduce the number of adult mosquitoes, especially the adults reaching residential areas, so monitoring adult numbers is the only way to evaluate the overall effectiveness of larval control efforts on a landscape scale. Adult abundance is monitored primarily with the use of light traps, supplemented by landing rates and service requests. Sampling at a larval site can determine if that particular site is being effectively controlled. Monitoring adult populations is needed to answer the larger question of whether the overall larval control is effective by not only conducting effective treatments, but also controlling a large enough proportion of the larval habitats to make a difference. However, collecting adults cannot usually be used to evaluate a particular larval site, because many larval sites may contribute to the adults found at a particular location.
- E) Sites where larvae are present are not automatically treated. Other factors are also considered. For the major salt marshes that require aerial larvicide, the treatment decisions are made by senior staff in the Division, rather than by the crews in the field. The County follows a policy stated in the Special Use Permit for operations on the Long Island Refuges: "Treatments will not be undertaken if it is determined that weather conditions, water levels in the marsh, previous treatments or other factors do not favor larval development". Weather conditions include the forecast temperature and rainfall, which may or may not cause the marsh to dry out before the larvae can emerge. Marshes that are flooded or very wet are likely to support larvae through their development, especially right after a spring or storm tide. Conversely, a mostly dry marsh with upcoming neap tides will often dry out quickly and not require treatment. Paradoxically, flooding rain and tides can also negate the need for treatment by allowing fish to access the larvae and/or washing them out of the habitat. If late stage larvae are present that have been recently treated with methoprene or *Bacillus sphaericus*, the larvae are unlikely to emerge and re-treatment is also not required. The County has no interest in treating sites where treatment is not necessary because other factors will lead to the demise of the larvae.
- F) For the routine program, the potential adverse impacts of not treating a larval site also need to be considered. The risk assessments conducted for the EIS demonstrate that the larvicides used in the program are far less toxic to people and more specific to target species in their action than the adulticides, and their use does not inherently involve exposure of the general public to pesticides. Environmentally and in terms of public health and welfare, the consequences of failing to control an important source of mosquitoes as larvae generally outweigh the consequences of using a larvicide. For this reason, the Division is very reluctant

to leave a major larval source untreated if there is doubt about its potential to cause problems. Too strict controls on larviciding could actually result in more adulticiding and therefore more severe adverse impacts than those prevented by not using the larvicide. In an integrated control program, larviciding needs to be considered not only as a potential source of impacts, but as a way of preventing impacts as well.

- G) The sampling protocols used at Wertheim and proposed for the evaluation of other wetlands management projects have been described in some detail and are considerably more sophisticated than those used in the routine program. When evaluating sites for water management and following up the results, all would agree rigorous sampling protocols should be used. One should be cautious, however, in analyzing the results once one gets beyond presence/absence, because mosquito larvae are inherently difficult to sample. The question of how to sample future projects is a topic which will be considered by the Wetlands Stewardship Program. When this type of more sophisticated sampling is conducted, the County agrees that specially trained staff should be used, procedures should be standardized and the program should be closely monitored to ensure accuracy. One must bear in mind, however, the many inherent difficulties involved in sampling mosquito larvae. These difficulties are well known among experienced practitioners in the field, and are described in standard texts such as M. W. Service's 1993 work, *Mosquito Ecology: Field Sampling Methods* (2nd edition). Elsevier Applied Science, Essex, UK. TNC's desire to rigorously evaluate mosquito larvae at water management sites is admirable, but must be tempered by the realities of this sampling problem. It would not be productive to insist on sampling protocols that are so rigorous and resource-intensive that they could never be implemented on a wide scale, if the County is to succeed in reducing larvicide use through wetlands management. An inability to sample to that standard should not be cited as a reason to ignore the palpable results in reducing mosquito production that have been obtained at Wertheim and elsewhere.

2. Methoprene Impacts

Comment:

In relation to the FGEIS responses to comments on non-target effects methoprene (see, e.g., Sections 4.8.1 and 4.9.5), TNC recommended that the section of the Plan which deals with protocols for application of methoprene should be re-opened for consideration, if additional scientific evidence that warrants re-opening becomes available.

Response:

The triggers for further environmental review which are specified in the FGEIS constitute the minimum conditions under which additional environmental review would be initiated. At any time, the County and/or the Council on Environmental Quality could commence additional environmental review based on substantial new technical information.

Also, on an annual basis, the Council on Environmental Quality will review Annual Plans of Work and make a recommendation with respect to the State Environmental Quality Review Act to

the Suffolk County Legislature. Annual Plans of Work will not automatically be exempt from environmental review.

3. Risk Assessment

Comment:

As summarized from the December 5, 2005 e-mail of Mr. Vincent Palmer, New York State Department of Environmental Conservation (regarding FGEIS Section 4.9.4, p. 424, discussing basis for risk assessment's addition of pyrethroid and PBO risk) and relating back to NYSDEC's July 17, 2006 letter on the Draft GEIS (see document AG in Volume 2 of 5): *"adding pyrethroid and PBO risks may not necessarily be conservative, because they act synergistically."*

Response:

The FGEIS response was not inaccurate. However, the response is out of context with respect to the FGEIS, the Plan, and supporting documents, and will benefit from the following information.

It is acknowledged that PBO is added to pyrethroid products as a synergist. As described in the Human Health Toxicological Literature Review (CA-SCDHS, 2005), PBO inhibits the enzymes that break down or metabolize pyrethroids by insects and mammals, thus making the pyrethroids more toxic and enabling a "quick kill" against target organisms. In insects and other invertebrates, when PBO is used in conjunction with a pyrethroid, often the organism cannot clear the pyrethroid quickly enough before it dies.

It is a very different situation for human and many other non-target organisms. As modeled in the risk assessment, doses of pyrethroids were much lower than threshold levels for effects, even given worst-case vector control exposure scenarios.

In addition, as pointed out in the Literature Review (CA-SCDHS, 2005), there are studies that indicate that though initial exposure to PBO may cause an inhibition of enzyme activity that detoxifies pyrethroids, the initial inhibition is actually followed by a period of enzyme stimulation. If the organism is not killed quickly by the combined effect of PBO and the pyrethroid, PBO may actually increase the organism's ability to detoxify the pyrethroid.

Synergy is an uncertainty in any risk assessment. There is no clear guidance. In this risk assessment it was assumed that the pyrethroids and PBO interacted in an additive manner. This is one of many conservative assumptions made in the risk assessment in acknowledgement of uncertainties such as synergy. Two recent risk assessments (Peterson et. al., 2006 and Westchester County, 2001, both reviewed in the DGEIS) similarly acknowledged uncertainty regarding synergy but did not take it into account quantitatively in the risk assessment. Therefore, although it is acknowledged that synergy between PBO and pyrethroids is an uncertainty, as synergy issues are in any risk assessment, the calculations and interpretations of results were handled appropriately and conservatively in this risk assessment, given current knowledge and federal guidance.

APPENDIX 1

REQUESTS FOR FGEIS CLARIFICATION

-----Original Message-----

From: Nicole Maher [<mailto:nmaher@tnc.org>]

Sent: Tuesday, December 05, 2006 8:45 PM

To: James.Bagg@suffolkcountyny.gov

Cc: snawkirk@tnc.org; kjacobs@citizenscampaign.org; seatuck04@earthlink.net;

beth@neighborhood-network.org; ccapp@groupforthesouthfork.org;

jkritzer@environmentaldefense.org; mac@peconicbaykeeper.org;

hawkauk7@optonline.net; growinwild@aol.com; aesposito@citizenscampaign.org;

matthew@peconicbaykeeper.org

Subject: RE: TNC Comments on FGEIS

December 5, 2006

Council on Environmental Quality

Att: James F. Bagg, Chief Environmental Analyst

County of Suffolk, State of New York

PO Box 6100

Hauppauge, NY 11788-0099

Re: Proposed Vector Control Long Term Plan & FGEIS

Dear Council on Environmental Quality,

On behalf of The Nature Conservancy, I submit the following comments on the Suffolk County Vector Control and Wetlands Management Long Term Plan and Final Generic Environmental Impact Statement (FGEIS).

In general, we would like to acknowledge that significant improvements have been made to the plan since our first review of it in October 2006 and even more improvements since our more recent review of the plan in July 2006. Three of these are particularly noteworthy.

First, composition of the Wetlands Stewardship Committee (formerly known as the Wetlands Screening Committee) has been expanded to include four representatives from non-governmental organizations, and representatives from all three estuary programs (PEP, SSER, LISS). This additional representation will bring both scientific expertise and a focus on wetland health to the Committee that will ensure an adequate level of oversight of wetland projects.

Second, the 15-acre threshold has been dropped such that the Wetlands Stewardship Committee has jurisdiction to review all wetland projects that fall into the categories of Best Management Practices (BMPs) 5-15.

Third, the County has supported a more comprehensive wetlands assessment and management program: The Suffolk County Wetlands Stewardship Program. This Stewardship program is more comprehensive than the earlier version in the Long-Term Plan, the scope of which was limited to wetlands of concern with respect to Vector Control activities. This stewardship program will address all of the County's tidal wetlands, and while mosquito control will be a consideration, marsh health will be the paramount goal. This science-based, collaborative effort would be charged with developing meaningful indicators of wetland health and assessing the health and restoration potential of Suffolk County's marshes. The program is a cooperative venture between Cornell Cooperative Extension, The Nature Conservancy, Suffolk County, The Stewardship Committee, and numerous other stakeholders.

However, the plan could still benefit from some revision:

1. The plan should further clarify the thresholds and criteria used to initiate the application of larvicide. The Nov 6 2006 update of the SCVC and wetlands Management LTP has been expanded to include an extended description of the larval sampling program however as far as I can see that text does not explicitly state that the threshold for treating marshes with larvicide is an average of 0.2 mosquito larvae per sample. The plan should specifically document the modifications from the standardized sampling protocols that they cite as reference for their larval surveillance. The plan should also indicate the implementation of regular staff training to assure an appreciation for the necessity of strict adherence to the protocol in order to produce reliable and trustworthy data.
2. The FGEIS should include specific language addressing the scientific controversy about the non-target effects of Methoprene. There is ongoing scientific debate about the toxicity of Methoprene to non-target organisms. There is conflicting evidence in the peer-reviewed scientific literature. Should additional scientific evidence become available and resolve this controversy and suggest that Methoprene is more of a threat than the FGEIS acknowledges, the section of the plan that deals with establishing protocols for application of Methoprene should be re-opened for consideration.

As stated in earlier communications, The Nature Conservancy is still concerned that the plan does not distinguish between aggressive biting salt marsh mosquitoes that are a nuisance and mosquitoes that are known to be

vectors of disease.

As noted above, the County has improved the plan with respect to many of the concerns expressed in these prior comments. Nevertheless, the points made in this letter remain applicable.

The modifications recommended above would substantially improve the plan and the ability of the Division of Vector Control to protect wetland health and ecology while simultaneously carrying out a highly effective mosquito control program. Please feel free to contact me if you have any questions.

Sincerely,

Nicole P. Maher, Ph.D.
Wetlands Specialist
The Nature Conservancy
250 Lawrence Hill Road
Cold Spring Harbor, NY 11724

-----Original Message-----

From: Vinny Palmer [<mailto:vapalmer@gw.dec.state.ny.us>]

Sent: Tuesday, December 05, 2006 3:32 PM

To: Juchatz, Amy

Cc: John Pavacic

Subject: Suffolk Co. Vector Control & Wetlands Mgt. Long-Term Plan and FGEIS

Amy,

As you may know, yesterday, NYSDEC personnel J. Pavacic, C. Hamilton, K. Graulich, D. Rosenblatt, R. Marsh, K. Chytalo, and C. deQuillfeldt, and I met with Suffolk County personnel W. Dawydiak, D. Ninivaggi, M. Dempsey, K. Shaw, T. Stebbins, and Cashin Associates' D. Tonges. We discussed the Suffolk County Vector Control and Wetlands Management Long-Term Plan, the associated FGEIS, and the Wetlands Stewardship Program.

During the meeting I requested clarification of information appearing at the top of page 424 of Volume 1 of 5 of the FGEIS, relating to the synergistic characteristics of the combination of pyrethroids and piperonyl butoxide (PBO). W. Dawydiak and D. Tonges asked that I bring this matter to your attention.

Please comment on my suggestion that this information be revised to make it clear as to the context in which the subject pyrethroid/PBO combination issue is being discussed - synergistic potential to enhance effectiveness of insecticidal control against target organisms, or synergistic impacts of pyrethroid/PBO combinations where toxicity to humans and other non-target organisms is concerned (acute, sub-chronic, chronic). I felt that the statement "Normally, two products that act in entirely different ways, as PBO and pyrethroids do, are not considered to enhance each other's effects" may be interpreted to misrepresent the use of PBO for the specific purpose of enhancing the insecticidal performance of pyrethroids. As for toxicity to non-target organisms where synergism is considered, I always think of the study involving chlordane and endosulfan in which it was reported that their combined impact on hormones was estimated to be as much as 1,600 times more powerful than their individual impacts. Please let me know if you agree that this section could benefit from some clarification. Thanks!

Vincent A. Palmer

Pesticide Control Specialist III

New York State Department of Environmental Conservation Division of Solid and
Hazardous Materials Bureau of Pesticides Management SUNY @ Stony Brook 50 Circle
Road Stony Brook, New York 11790-3409

(631) 444-0340

Fax: (631) 444-0231