



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
NATURAL HERITAGE & ENDANGERED SPECIES
4876 HAY POINT LANDING ROAD
SMYRNA, DELAWARE 19977

TELEPHONE: (302) 653-2880
FAX: (302) 653-3431

June 22, 2009

Kenneth L. Davis
Cabe Associates, Inc.
144 South Governors Avenue
P.O. Box 877
Dover, DE 19903-0877

RE: *Wandendale Regional Wastewater Treatment and Disposal Facility*
Applicant: Tidewater Environmental Services, Inc.



Dear Mr. Davis:

Thank you for contacting the Natural Heritage and Endangered Species program about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project. Please note that we have reviewed this project via the State's Preliminary Land-use Service (PLUS) as PLUS 2008-05-02. The Office of State Planning Coordination's official website is at <http://stateplanning.delaware.gov>

Tax Parcel 2-34-7.00-130.00:

You requested that we focus our comments specifically on tax parcel 2-34-7.00-130.00, but we recognize that this parcel only encompasses a portion of the entire project. We have concerns regarding the entire project and those are included for use in long-term planning efforts.

Rare Species

Our Division scientists have not surveyed this project area; therefore, we are unable to provide information pertaining to the existence of state-rare or federally listed plants, animals or natural communities at this project site. In the absence of site-specific information, we offer the following comments:

There are rare species upstream and downstream associated with Love Creek or with wetlands that border the creek. Efforts to protect water quality within the creek are especially important if these species are to persist. The site plan included with your

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request indicates that a 200ft upland buffer will be left intact between wetland boundaries and project disturbance. Typically, this buffer width would provide adequate protection for water quality, however, long-term impacts from the continued spraying of wastewater is unknown. Potential long-term impacts to water quality from increased nutrient input and from the saline chemicals used in treating wastewater should be examined.

Remaining 3 parcels of project (234-7.00-127.00, 234-11.00-50.00, 234-11.00-48.00):

- *Rare Species/Site Visit Request*

Our Division scientists have not surveyed this project area; therefore, we are unable to provide information pertaining to the existence of state-rare or federally listed plants, animals or natural communities at this project site.

In order to provide informed comments, our program scientists request the opportunity to conduct a survey of these parcels to evaluate habitat and determine the potential for Species of Greatest Conservation Need (SGCN)¹. Please note that our scientists have decades of experience in comprehensive rare species survey methods. They have extensive knowledge of the flora and fauna of the state and are qualified in making rare species identifications. The survey will be conducted at no expense to the landowner.

Please contact me at (302) 653-2880 ext. 101 or at Edna.Stetzar@state.de.us if the landowner will grant a site visit.

- *Forest loss and fragmentation*

Cumulative forest loss throughout the state is of utmost concern to our Division which is responsible for conserving and managing the states wildlife. All three parcels contain some forested areas and this project will impact the forest by clearing for infrastructure and by the spraying of wastewater. When we reviewed this project during PLUS, the applicant indicated that 10.4 acres out of 130 acres of forest would be cleared and that most of the forested areas were going to be left intact.

Impacts to wildlife can be further minimized by:

- 1) Maintaining connections to adjacent forested areas. Many species of wildlife require larger, connected blocks of forests for breeding and foraging. Connections between habitats are also used as a travel corridor during daily and seasonal migration.

¹ Species of greatest conservation need (SGCN) are indicative of the overall diversity and health of the State's wildlife resources. Some may be rare or declining, others may be vital components of certain habitats, and still others may have a significant portion of their population in Delaware. SGCN are identified in the Delaware Wildlife Action Plan (DEWAP) which is a comprehensive strategy for conserving the full array of native wildlife and habitats-common and uncommon- as vital components of the state's natural resources. This document can be viewed via our program website at <http://www.dnrec.state.de.us/nhp>.

2) If feasible, those features that will require tree clearing should be relocated to a non-forested portion of the site.

2) We recommend that tree clearing not occur April 1st to July 31st to minimize impacts to birds and other wildlife that utilize forested areas for breeding.

- *Potential impacts of wastewater on wildlife that inhabit forested areas*

We are aware of a few studies that have evaluated the compatibility of wastewater irrigation in forested areas with wildlife use and health. Several studies that have raised some concerns are explained below. A more extensive review of the literature should be conducted, and / or controlled experiments evaluating use of these areas by wildlife, or contaminant studies on wildlife, should be considered.

1) Potential impact to ground nesting birds

Several studies were conducted on forested game lands in Pennsylvania to compare bird species diversity on wastewater irrigated versus non-irrigated sites (Rollfinke et al 1990², Rohnke & Yahner 2008³). Bird species diversity (number of species) and evenness (relative proportions) declined on the irrigated sites. This response could mostly be explained by irrigation-induced changes in vegetation. Depending on the frequency of spraying and the areas to be irrigated, impacts to ground-nesting species is possible. Of particular concern would be changes in vegetative cover and structure that could potentially impact species that are more habitat-specific.

2) Potential impacts to amphibian populations

Research findings suggest that wastewater sprayed on forested areas could have long-term adverse impacts on amphibian reproduction. Although wastewater effluent is not believed to be immediately acutely toxic to the terrestrial salamander species that were studied, long-term adverse effects need further study (Laposata & Dunson 2000⁴). Higher concentrations of sodium were found in those species inhabiting wastewater. Studies also suggest that wastewater effluent may reduce the survival of amphibian eggs and larvae (Laposata and Dunson, 2000⁵). In a forested area in Pennsylvania, significantly fewer egg masses of wood frogs (*Rana sylvatica*), Jefferson salamanders

² Rollfinke, B., R. Yahner and J. Wakeley. 1990. Effects of forest irrigation on long-term trends in breeding-bird communities. *Wilson Bull.*, 102(2): 264-278.

³ Rohnke, A. and R. Yahner. 2008. Long-term effects of wastewater irrigation on habitat and a bird community in central Pennsylvania. *Wilson Journal of Ornithology* 120(1): 140-152.

⁴ Laposata, M., W. Dunson. 2000. Effects of treated wastewater effluent irrigation on terrestrial salamanders. *Water, Air, and Soil Pollution* 119:45-57.

⁵ Laposata, M., W. Dunson. 2000. Effects of spray-irrigated wastewater effluent on temporary pond-breeding amphibians. *Ecotoxicology and Environmental Safety* 46: 192-201.

(*Ambystoma jeffersonianum*), and spotted salamanders (*A. maculatum*) were found in wastewater irrigated ponds compared to those found in natural ponds.

In the absence of site specific information, the following recommendations for these parcels should be considered:

- 1) Annual monitoring for breeding birds and bird use to examine the effects of the spray irrigation, especially on ground nesting birds as described above.
- 2) Annual monitoring for impacts to amphibian populations (if present) is recommended to examine the effects of spray irrigation.
- 3) At least a 100ft upland buffer (preferably 300ft) should be left intact between spraying activities and all wetlands. It should be noted that this buffer may not sufficiently provide long-term water quality protection.

We are continually updating records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information. If you have any questions, please contact me at (302) 653-2880 ext. 101 or Edna.Stetzar@state.de.us.

Sincerely,



Edna J. Stetzar

Biologist/Environmental Review Coordinator

(Please see Invoice on next page)