Requirements

Rare, Threatened and Endangered Species. There is a population of Delmarva fox squirrel (*Sciurus niger cinereus*, DFS) within the Nanticoke Wildlife Area and they could occur within the project area. Delmarva fox squirrels are large-bodied tree squirrels that only inhabit mature forests on the Delmarva Peninsula. Threatened mainly by loss of its forested habitat, DFS have been protected as an endangered species since 1967. As **required** by the **Endangered Species Act of 1973(16 U.S.C. 1531-1544, 87 Stat. 884)** the U.S. Fish and Wildlife Service review projects that may harm this species or their habitat. The applicant will need to contact Trevor Clark of the U.S. Fish and Wildlife Service (410-573-4527) with this **new** application. We have been in contact with Trevor and previous applications and correspondence will have to be updated. Trevor may recommend surveys are conducted to determine if Delmarva fox squirrels are present. If surveys are conducted they must be done by a federally approved fox squirrel surveyor, be conducted twice; once in the fall, and again between March 15 and May 30. A list of qualified surveyors is available upon request (contact Holly Niederriter at (302) 735-2880). Please note that surveys may confirm the presence of fox squirrels but cannot confirm absence.

Also note that surveys conducted on other properties in the vicinity do not fulfill requirements for the project properties. The forest within this project area is contiguous with the Nanticoke Wildlife Area where there is a known presence of Delmarva fox squirrel. Also, a decision regarding habitat impacts of other projects in the vicinity are not transferrable to this project.

Additional comments and concerns about rare, threatened and endangered plant and animal species are included in the Recommendations section.

Hunting Safety Zone. This project is adjacent to a relatively undisturbed section of the Nanticoke Wildlife Area (NWA) and the State is concerned that this project will negatively impact these publicly used lands. The developer/landowner is strongly encouraged to contact the Regional Wildlife Area manager, Rob Gano, at (302-539-3160) and discuss this project.

1) Hunting is a recreational opportunity offered to all residents of Delaware, occurs on publicly owned land, is a method of wildlife management, and is well established at this Wildlife Area. If the applicant does not provide for a safety zone, then public land will be lost for use to the public for hunting because discharging a fire arm within 100 yards of an occupied dwelling is prohibited ***(Title 7 § 723. Hunting or trapping in safety zones; penalty. See below)*.**

   Placing residential units (Lots #16-25) so close to the shared property line will significantly decrease the active hunting area within the Nanticoke Wildlife Area. This will have negative impacts on the LWCF 6(f) protected lands by reducing the amount of area offered to the public for hunting while intensifying the need for public hunting access for the citizens of the State of Delaware.

Title 7 of Delaware Code 723 (a) § 723. Hunting or trapping in safety zones; penalty.

(a) *No person, except the owner or occupant, shall discharge a firearm within 100 yards of an occupied dwelling, house or residence or any barn, stable or any other building used in connection therewith, while hunting or trapping for wild birds or wild animals of any kind. The area within said distance shall be a "safety zone," and it shall be unlawful to shoot at any wild bird or wild animal while it is within such safety zone without the specific advance permission of the owner or tenant*.

We request that the applicant provide the safety zone between the wildlife area and the development since the wildlife area is well established and hunting is an existing use. A 300-foot wooded buffer (without lot lines) should be left intact between the NWA boundary and any dwellings. Houses should be set to the front of the lots to maximize the distance to the State Boundary. The site design should be altered to ensure the residential lots are outside the 100 yard safety distance from the Wildlife Area boundary. The 100 yard buffer would impact Lot #16 thru Lot #25. These sites would need to be removed or relocated.

In addition, prior to purchasing, residents should be made aware by the developer/land owner that they will be subject to the noise of fire arms and barking dogs that are pursing game. Hunters may also be using the wildlife area during the early morning hours.

2) Developments adjacent to wildlife areas have often resulted in the **illegal** use of all terrain vehicles (ATVs) by new residents. ATVs not only destroy habitat, but become an on-going enforcement issue costing the State time and money to enforce. The developer/landowner should make sure new residents are aware that the use of ATVs by non-wildlife area staff is **illegal and punishable by law.**
3) Trash can become an on-going problem. The developer/landowner should make sure residents are aware that dumping trash in the wildlife area is **illegal.** Trash can also blow into the wildlife area during construction activities and then from residents. An adequate forested buffer as described above is essential for prevention.

Nanticoke Wildlife Area. Land to the south of the proposed development is part of the Nanticoke Wildlife Area. These lands were purchased through the Federal Land and Water Conservation Fund Act. Passed by Congress in 1965, the act established the Land and Water Conservation Fund (LWCF), a matching assistance program that provides grants to States and local governments for the acquisition and development of public outdoor recreation sites and facilities. Section 6(f) of the Act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of the Interior's National Park Service (NPS). All lands purchased through the LWCF are protected in perpetuity and must remain publicly accessible for outdoor recreation purposes.

Sediment and Stormwater Program. A detailed sediment and stormwater plan will be required prior to any land disturbing activity taking place on the site. A pre-application meeting is required for this site. Contact the reviewing agency to schedule a pre-application meeting to discuss the sediment and erosion control and stormwater management components of the plan as soon as practicable. The site topography, soils mapping, pre- and post-development runoff, and proposed method(s) and location(s) of stormwater management should be brought to the meeting for discussion. The plan review and approval as well as construction inspection will be coordinated through the Sussex Conservation District. Contact Jessica Watson at the Sussex Conservation District at (302) 856-2105 for details regarding submittal requirements and fees (Delaware Code, Title 7, Chapter 40; Delaware Regulations, Administrative Code, Title 7, 5101). *James Sullivan - (302) 739-9921, James.Sullivan@state.de.us*

Flood Management. Approximately 24 lots are presently located in the 1% annual chance floodplain per FEMA's maps as noted on the site plan. Sussex County is a participating community in the National Flood Insurance Program (NFIP). As a participating community they are required to adopt and enforce floodplain regulations. This parcel is partially inundated by a Zone A floodplain. Sussex County's regulations require that any parcel greater than 5 lots or 50 acres submit a base flood elevation. Since the Zone A floodplain is an approximate area and no base flood elevation has been established, a detailed flood study must be done. We request the study accurately depict the proposed site conditions and stormwater methods. We suggest the flood study be submitted to FEMA for a physical map revision. *Gregory Williams - (302) 739-9921, Gregory.Williams@state.de.us*

Wetlands. According to the Statewide Wetland Mapping Project (SWMP) maps, tidal (PFO1R3) and non-tidal riparian (PFO1A7 & PUBHx7) wetlands were mapped on subject parcel (Figure 1). The applicant is responsible for determining whether any State-regulated wetlands (regulated pursuant to 7 Del.C. Chapter 66 and the Wetlands Regulations) are present on the property. This determination can only be made by contacting the Division of Water Resources' Wetlands and Subaqueous Lands Section at 302/739-9943 and consulting the State's official wetland regulatory maps, which depict the extent of State jurisdiction. The area regulated by State law may be very different from the area under federal authority. No activity may take place in State-regulated wetlands without a permit from DNREC's Wetlands Section.

In addition, most perennial streams and ditches and many intermittent streams and ditches are regulated pursuant to the Subaqueous Lands Act (7 Del.C. Chapter 72) and the Regulations Governing the Use of Subaqueous Lands. Ponds which are connected to other waters are also regulated, while isolated ponds are not. Any work in regulated streams, ditches or ponds requires a permit from the Wetlands and Subaqueous Lands Section. An on-site jurisdictional determination is recommended in order to determine whether any regulated watercourses exist on the property. Please contact the Wetlands and Subaqueous Lands Section at 302/739-9943 to schedule an on-site visit**.** Such appointments can usually be scheduled within 2 to 3 weeks.

When designing a project on a site with regulated watercourses, any extensive piping, filling or burying of streams or ditches in excess of the minimum needed for road crossings should be avoided. Where road crossings are necessary, bridge spans which avoid significant impacts to stream banks and channels should be used wherever possible. Where placement of culverts is unavoidable, culvert designs which utilize multiple barrels at different elevations to preserve a low flow channel are usually preferred. Contact the Wetlands and Subaqueous Lands Section for further information regarding preferred designs.

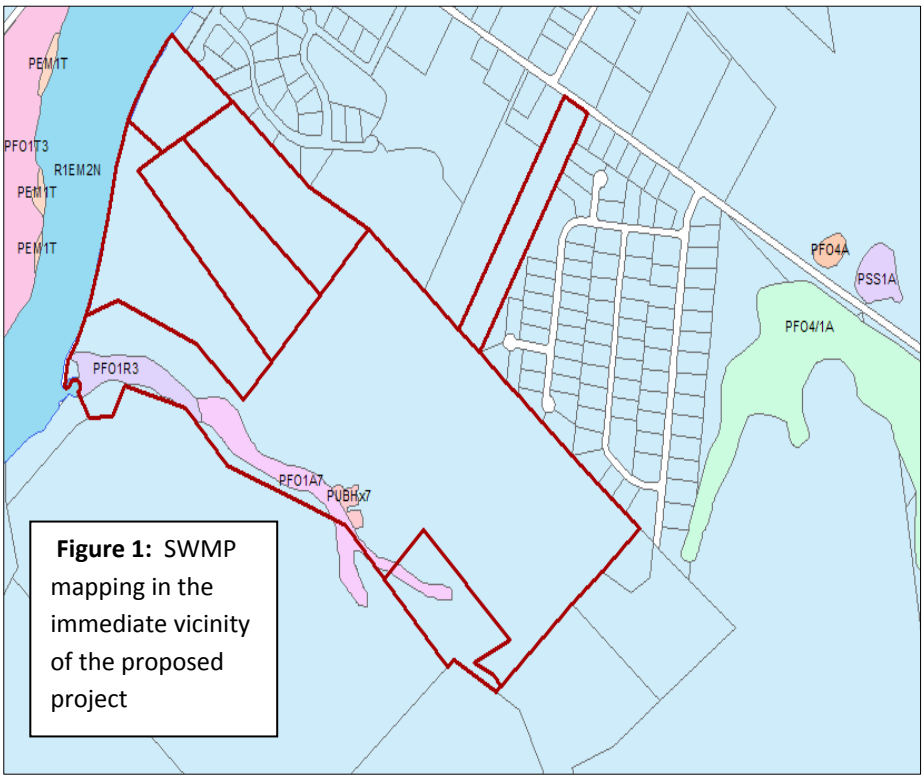


Figure 1: SWMP mapping in the immediate vicinity of the proposed project

The applicant should also be reminded that they must avoid construction/filling activities in those areas containing wetlands or wetland associated hydric soils as they are subject to regulatory jurisdiction under Federal 404 provisions of the Clean Water Act. A site-specific field wetlands delineation using the methodology described in the 1987 United States Army Corps of Engineers (USACE or "the Corps")

manual is the acceptable basis for making a jurisdictional wetland determination for nontidal wetlands in Delaware.

The applicant is forewarned that the Corps views the use of the National Wetlands Inventory (NWI) mapping or the Statewide Wetlands Mapping Project (SWMP) mapping as an unacceptable substitute for making such delineations. To ensure compliance with said Corps regulatory requirements, it is strongly recommended that a field wetlands delineation using the above-referenced methodology be performed on this parcel before commencing any construction activities. It is further recommended that the Corps be given the opportunity to officially approve the completed delineation. In circumstances where the applicant or applicant's consultant delineates what they believe are nonjurisdictional isolated (SWANCC) wetlands, the Corps must be contacted to evaluate and assess the jurisdictional validity of such a delineation. The final jurisdictional authority for making isolated wetlands determinations rests with the Corps; they can be reached by phone at 736-9763.

Based on a review of existing buffer research by Castelle et al. (Castelle, A. J., A. W. Johnson and C. Conolly. 1994. *Wetland and Stream Buffer Requirements – A Review.* J. Environ. Qual. 23: 878-882.), an adequately-sized buffer that effectively protects wetlands and streams, in most circumstances, is about 100 feet in width. In recognition of this research and the need to protect water quality, the Watershed Assessment Section recommends that the applicant maintain/establish a minimum 100-foot upland buffer (planted in native vegetation) from all water bodies (including ditches) and wetlands.

Water Supply. The project information sheets state that individual on-site well(s) will be used to provide water for the proposed project. Our records indicate that the project is not located in an area where public water service is available. The Division of Water Resources will consider applications for the construction of on-site wells provided the wells can be constructed and located in compliance with all requirements of the current Regulations Governing the Construction and Use of Wells. A well construction permit must be obtained prior to constructing each and every well(s).

Should dewatering points be needed during any phase of construction, a dewatering well construction permit must be obtained from the Water Supply Section prior to construction of the well points. In addition, a water allocation permit will be needed if the pumping rate will exceed 50,000 gallons per day at any time during operation.

All well permit applications must be prepared and signed by licensed water well contractors, and only licensed well drillers may construct the wells. Please factor in the necessary time for processing the well permit applications into the construction schedule. Dewatering well permit applications typically take approximately four weeks to process, which allows the necessary time for technical review and advertising. *Ricardo Rios - (302) 739-9944, Ricardo.Rios@state.de.us*

Recommendations

State-Rare, Threatened, Endangered Species and Species of Greatest Conservation Need (SGCN[1]) ***(regulatory if wetland permits are required):***

In addition to many species of more common plants and animals, several species of conservation concern have been documented in the adjacent Nanticoke Wildlife Area. Forest within the project area is part of this same forest block and these species could also occur within the project area and be impacted by the high level of forest removal and fragmentation being proposed.

The following State-rare species and Species of Greatest Conservation Need (SGCN) have been documented in the forest adjacent to and contiguous with the project area:

Scientific Name	**Common Name**	**Taxon**	**State Rank**	**State Status**	**SGCN Tier**	**Federal Status**
Sciurus niger cinereus	Delmarva fox-squirrel	Mammal	S1	E	Tier 1	E
Buteo lineatus	red-shouldered hawk	Bird	S2B/S3 N		Tier 2	
Setophaga rutillica	American redstart	Bird	S1B		Tier 1	
Strix varia	barred Owl	Bird	S2		Tier 2	
Opheodrys aestivus	Northern rough green snake	Reptile	S1			
Hemidactylium scutatum	four-toed salamander	Amphibian	S1		Tier 2	
Callophrys irus	frosted elfin	Insect	S1	E	Tier 1	
Dichanthelium columbianum	hemlock witch grass	Plant	S1		n/a	
Chamaecyparis thyoides	Delmarva Atlantic white cedar wetland	Community	S2		n/a	

State Rank: S1- extremely rare within the State (typically 5 or fewer occurrences); S2- very rare within the State (6 to 20 occurrences); S3-rare to uncommon in Delaware, B - Breeding; N - Nonbreeding;

State Status: E – endangered, i.e. designated by the Delaware Division of Fish and Wildlife as seriously threatened with extinction in the State;

Federal Status: E – endangered, i.e. designated by the U.S. Fish and Wildlife Service as being in danger of extinction throughout its range; T – threatened, i.e. designated by USFWS as being likely to become endangered in the foreseeable future throughout all or a significant portion of its range; C-candidate –

[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**. This document also contains a list of Species of Greatest Conservation Need, Key Wildlife Habitat, and species-habitat associations.

Taxa for which the U.S. Fish and Wildlife Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. **SGCN Tiers: Tier 1** Species of Greatest Conservation Need (SGCN) are those that are most in need of conservation action on order to sustain or restore their populations. They are the focus of the Delaware Wildlife Action Plan (DEWAP), which is based on analyzing threats to their populations and their habitats, and on developing conservation actions to eliminate, minimize or compensate for these threats. **Tier 2** SGCN are also in need of conservation action, although not with the urgency of Tier 1 species. Their distribution across the landscape will help determine where DEWAP conservation actions will be implemented on the ground. n/a-not applicable-plant species of concern are not addressed in the DEWAP.

- *Ancient Sand Ridge Forest*

According to our GIS database and aerial photographs there is a potential for an Ancient Sand Ridge Forest to occur within the proposed project area. This forest type develops on well-drained sandy substrates of ancient, prehistoric sand ridges or dunes. These ridges are unique geologic features on the landscape that were created by wind-blown sediments about 13,000 to 30,000 years ago when the climate was much cooler and drier. The forests are typically composed of several species of oak, as well as species of hickory and pine. Many of these ridges have been identified as occurring along the east side of the Nanticoke River, south of Seaford. However, their distribution in Delaware is not entirely clear and they may be more widespread in Sussex County, as well as in Kent County, but more study is needed. The ancient sand ridge forest type is often home to several State rare plant species and one species in particular, wild lupine (*Lupinus perennis*), is the host plant for a state and globally rare butterfly, the frosted elfin (*Callophrys irus*). More surveys are needed, but there is potential for other rare and uncommon insects and animals to be found within this forest type. Protection of these ancient sand ridges and associated forests are critical to the long term conservation of the State's natural heritage.

- *Freshwater Tidal and non-tidal marsh areas*

  This project has inadequate (less than 100 feet) wetland buffers which could lead to long-term degradation of the marsh habitat through fragmentation and disturbance. Scientific research has proved that buffers less than 100 feet in width are inadequate for the protection of water quality. In addition, upland buffers around wetlands provide critical habitat for wetland dependent species during a portion of their life cycle.

- *Atlantic White Cedar Wetlands*

  According to our GIS database there is a potential for Atlantic white cedar wetlands to occur within the project area. This State-rare community typically grows under unique conditions which are often refugia for rare species. This wetland type is sensitive to sedimentation and changes in water quality, especially pH. The hydrological regime is a major determinant of the

resulting biota in this system and we are concerned how this project could affect the hydrology of this community.

Recommendations/Concerns:

1) Lots along the shoreline (approximately lots 33-42) may generate future requests for docks and piers which limit shoreline access (where fishing is optimum) to anglers fishing from boats in the river. Cumulative impacts to fisheries habitat should be considered as the construction of piers and docks along the Nanticoke River and its tributaries has escalated in recent years. The Nanticoke River is a highly popular fishing location and shoreline access is decreasing as the number of piers/docks increase. The river is not private property and should be accessible to all. The Nanticoke River/Broad Creek complex is the most heavily fished stream in Delaware by licensed anglers, constituting nearly 20% of stream angling overall. It is heavily utilized by both resident and non-resident anglers and has been popular for many years. Statewide, the most sought- after fish by Delaware-licensed anglers is the largemouth bass and the Nanticoke River bass fishery has been the most popular fishery in the State. The Nanticoke River fishery also supports the majority of the largemouth bass tournament angling in Delaware and has been the single most popular tournament site for 15 consecutive years.

   Fisheries research has also documented the detrimental effects of shoreline modification on fish: 1) removal of trees along the shoreline can reduce the effects of shading which is important for maintaining water temperature conducive to spawning, 2) alteration of shoreline habitat can affect the distribution of benthic and macro-invertebrates which serve as the forage base for many fish species, 3) direct impacts to important nursery habitat occur by replacing natural habitat with man-made materials along the shoreline, and 4) local habitat modification can lead to changes in species richness.

   It is recommended that at least a 100-foot buffer be left intact along the shoreline not only to protect water quality and the shoreline from erosion, but to provide continued shoreline access to anglers fishing in the river. This buffer zone should be placed in a conservation easement.

2) Cumulative forest loss throughout the State is of utmost concern to the Division of Fish and Wildlife which is responsible for conserving and managing the State's wildlife ***(see www.fw.delaware.gov and the Delaware State Code, Title 7)***. Because of an overall lack of forest protection, we have to rely on applicants and/or the entity that approves the project (i.e. counties and municipalities) to consider implementing measures that will aide in forest loss reduction. This project will result in the fragmentation of over 141 acres of forest and the clearing of at least 70 acres of trees.

   The forest within the project area is part of a larger forest block known to support many species of wildlife, including those that are of conservation concern. Connectivity to tracts to the north will be lost. Essentially this project will convert an existing forest into 'residential' woods, sever

wildlife travel connections to points north, and displace wildlife, putting greater pressure on the wildlife area to provide resources. It is also likely that there will be human/animal conflicts including interactions on the roadways.

We recommend that the applicant consider preservation of some or all of the forest at this site. There are incentive-based programs for wildlife management available to private landowners through our agency. Please contact Bill Jones at (302) 284-4795 if the landowner(s) is interested in more information

If preservation is not going to be considered, then we request the following:

3) Buffers between development and the Wildlife Area are critical for reducing impacts to species supported by the wildlife area. The close proximity of this project can impact the suitability of the area to support native species. Without an adequate buffer, invasive plant species planted by homeowners or that naturally occur as the area is disturbed by construction, could out compete native and rare species. The 300-foot buffer as described above will not only provide the required safety zone but will also protect the wildlife area from invasive species infiltration.

4) This parcel is part of a larger forest block with sensitive species and protection of natural features should be a first priority. We recommend the applicant consider redesigning the site and use Smart Design Standards proposed in the Sussex County Comprehensive Plan. This type of design will reduce forest loss, maximize open space, and reduce impervious surfaces.

5) Determine if an ancient sand ridge forest occurs on the property and if so, reconfigure site plan to minimize impacts.

6) Provide at least a 100-foot buffer between wetlands and lots or infrastructure. This will require redesigning the site or omitting both lots and infrastructure. Lots 33-42 are only 50 feet from the edge of the Nanticoke River.

7) Delineate the Atlantic White Cedar Wetland community and ensure that this State-rare community is left undisturbed with at least a 100-foot (preferably 300-foot) buffer between its boundaries and lots/infrastructure.

Site Visit Request. Although we have surveyed the adjacent parcels within the Nanticoke Wildlife Area, our Division scientists have not surveyed the project area. In order to provide informed comments for this application, we request the opportunity to conduct a survey of the property to evaluate habitat and determine the potential for species of conservation concern. 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. Recommendations resulting from the survey would allow the applicant the opportunity to reduce potential impacts to rare species and unique habitats and

to ensure that the project is environmentally sensitive. Please contact Edna Stetzar at (302) 735-8654 or at Edna.Stetzar@state.de.us if the landowner will grant a site visit.

Impervious Surfaces and Best Management Practices. Based on a review of the project's conceptual lot layout, post-construction surface imperviousness will likely be considerably higher than the stated figure (14%) provided in the PLUS application; the TR-55 methodology indicates closer to 20-25 percent imperviousness for a development of this type and coverage. It is not clear if the impervious cover figure truly reflects all post-construction forms of created surface imperviousness. We strongly recommend that the applicant recalculate surface imperviousness with all forms of constructed surface imperviousness (e.g., rooftops, driveways, parking lots, sidewalks, open-water stormwater management structures, artificial turf, and roads) included in the calculation. Failure to include all forms (and their extent) of surface imperviousness will underestimate this project's post-construction environmental impacts.

It is strongly recommended that the applicant implement best management practices (BMPs) that reduce or mitigate some of its most likely adverse impacts. Reducing the amount of surface imperviousness through the use of pervious paving materials ("pervious pavers") in lieu of asphalt or concrete in conjunction with an increase in forest cover preservation (or establishment of additional forest cover acreage) are some examples of practical BMPs that could easily be implemented to help reduce surface imperviousness.

TMDLs. The project is located in the greater Chesapeake drainage, specifically within the Nanticoke watershed. In this watershed, the State of Delaware has developed specific Total Maximum Daily Load (TMDL) pollutant reduction targets for nitrogen, phosphorus, and bacteria (under the auspices of Section 303(d) of the Clean Water Act). A TMDL is the maximum level of pollution allowed for a given pollutant below which a "water quality limited water body" can assimilate and still meet State water quality standards (e.g., dissolved oxygen, nutrients, and bacteria; State of Delaware Surface Water Quality Standards, as amended July 11, 2004) to the extent necessary to support use goals such as, swimming, fishing, drinking water and shell fish harvesting. The TMDL for the Nanticoke watershed calls for a 30 and 50 percent reduction in nitrogen and phosphorus from baseline conditions. The TMDL also calls for a 2 percent reduction in bacteria from baseline conditions. However, more stringent TMDL reduction(s) may be developed by the EPA (in the near future) for the entire Chesapeake drainage, thus increasing the TMDL reduction targets for the Nanticoke watershed or supplanting the existing TMDL reduction targets developed by the State.

The applicant should be made aware that the State of Delaware is expected to develop water shed implementation plans and 2-year progress milestones as part of an accelerated effort to restore waters of the Chesapeake Bay. Failure to attain significant reductions in nutrient pollutants may subject the State to potential Federal actions or penalties.

This project, as currently conceived, will not meet the TMDL nutrient pollutant reduction requirements for nutrient pollutants.

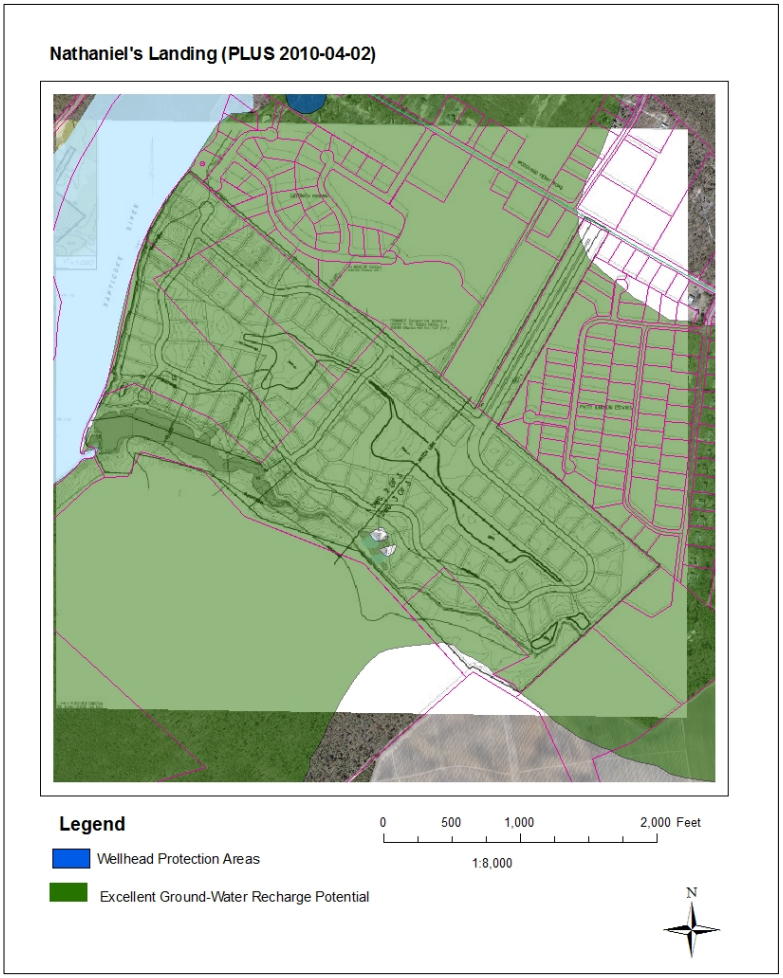
A Pollution Control Strategy (PCS) is the regulatory directive requiring the implementation of various best management practices (BMPs) that help reduce transport of nutrient and bacterial pollutant runoff from all waters draining into a "greater" common watershed; with the ultimate objective of achieving the obligatory TMDL reduction requirements for that watershed. However, the PCS for the Nanticoke River watershed has not been formally completed to date. In absence of a current PCS, the applicant is strongly urged to reduce nutrient and bacterial pollutants through voluntary commitment to the implementation of the following recommended BMPs:

- A 100-foot buffer width from all delineated wetlands via USACOE and State approved wetland delineations.
- The applicant is advised to seek connection to a central sewer or community system rather than individual septic disposal systems.
- Significantly reduce the amount of forest cover slated for removal. Removing most of the forest cover as the applicant has proposed will significantly increase nutrient runoff.
- Please recalculate the project's surface imperviousness and include all forms of created surface imperviousness (e.g., rooftops, driveways, parking lots, sidewalks, open-water storm water management structures, and roads) in the revised calculation.

- We strongly recommend the use of pervious paving materials (instead of conventional asphalt and concrete), rain gardens, and green-technology storm water management structures (in lieu of open-water management structures) as BMPs to reduce the impacts associated with all sources of created surface imperviousness.
- We strongly encourage the applicant to assess how their development will affect nutrient runoff via the Nutrient Budget protocol. Please contact Lyle Jones at 302-739-9939 for more information on the assessment tool.

Soils, wetlands, subaqueous lands and TMDL comments provided by John Martin, Watershed Assessment Section, (302) 739-9939, John.Martin@state.de.us

Water Resource Protection Areas. The DNREC Water Supply Section has reviewed the above referenced PLUS project and determined that it falls entirely within an excellent ground-water recharge area for the Sussex County, State Investment Level 4 (see attached map). The site plans show storm water management ponds in the area of excellent recharge. In addition, each of the 99 residences will have an onsite wastewater disposal system and individual wells. Although Sussex County's Source Water Protection Ordinance meets the minimum standards of protection, this protection does not afford this environmentally sensitive area adequate protection. Excellent Ground-Water Recharge Areas are those areas mapped by the Delaware Geological Survey where the first 20 feet of subsurface soils and geologic materials are exceptionally sandy. These soils are able to transmit water very quickly from the land surface to the water table. This map category (excellent) is an indicator of how fast contaminants will move and how much water may become contaminated (Andres, 2004). Land use activities or impervious cover on areas of excellent ground-water recharge potential may adversely affect ground water in these areas.



The construction phase of storm water management ponds requires excavation, hauling, and grading. The heavy equipment used in this phase has the capacity to compact and degrade the structure of the strata that defines the area as an excellent ground-water recharge area (Schueler, 2000). Changes to the structural soil properties may cause significant reduction in recharge capacity. Installing storm-water management ponds in excellent ground-water recharge areas has the potential to contaminate the ground water beneath it and infiltrate into the aquifer.

DNREC recommends:

- Using Better Management Practices in the design, construction, and maintenance of a storm water management system designed to address water quality with respect to nutrient and other pollutant loads.

The installation of individual wastewater disposal systems may contribute to elevated levels of bacteria and nutrients. This may affect the individual residential wells as well as contribute to the TMDL of the Nanticoke River.

- Using advanced wastewater disposal systems or a community system that allows for the treatment of wastewater before infiltration.

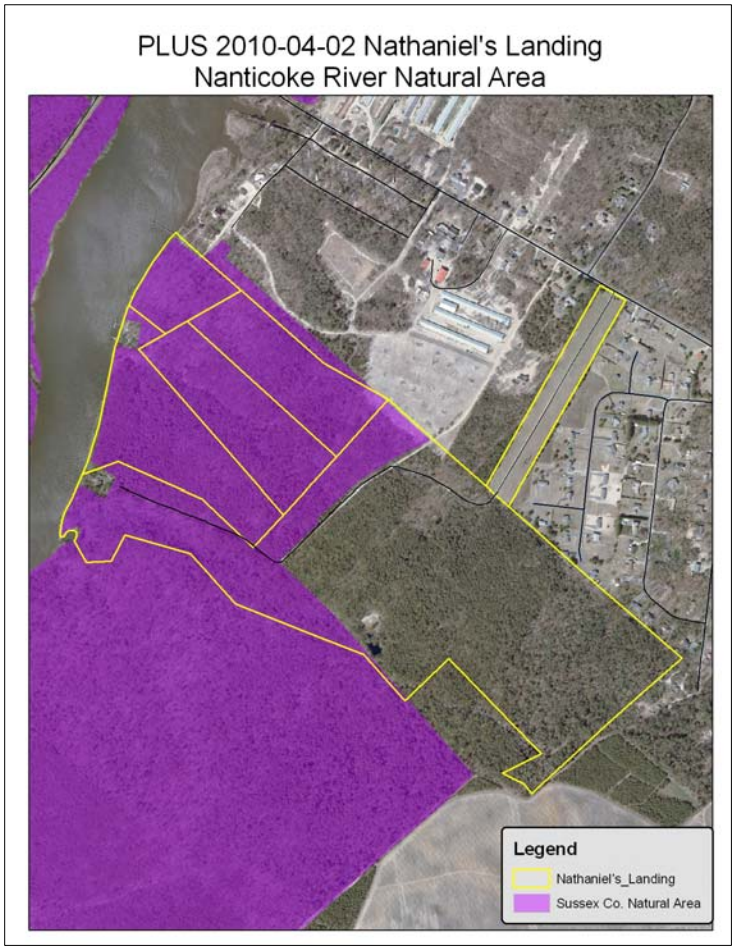
In addition, because the excellent ground water recharge area can readily affect the underlying aquifer if contaminants are spilled or discharged across the area, the storage of hazardous substances or wastes should not be allowed within the area unless specific approval is obtained from the relevant state, federal, or local program. *Anne Mundel - (302) 739-9945, Anne.Mundel@state.de.us*

References

Andres, A. Scott, 2004, Ground-Water Recharge Potential Mapping in Kent and Sussex Counties, Delaware: Delaware Geological Survey Report of Investigations No. 66, p. 14. http://www.udel.edu/dgs/Publications/pubform.html#nvestigations

Schueler, T. R., 2000, The Compaction of Urban Soils, *in* Schueler, T.R., and Holland, H.K., eds., The Practice of Watershed Protection: Ellicott City, MD, Center for Watershed Protection, p. 752.

Natural Areas. The entire woods north/northwest of Nathanial's Landing Road is a part of the Nanticoke River Natural Area and as such, the applicant is urged to consider permanent preservation of the Natural Area, especially as it is directly adjacent to the Nanticoke Wildlife Area.
The Office of Nature Preserves works closely with the Delaware Natural Heritage and Endangered Species Program (NHESP) as many of the species associated with the NHESP program provide the reasoning for designating an area a State Natural Area. The Office supports comments provided by NHESP on this project, especially comments associated with the presence of Delmarva Fox Squirrel.



Parks and Recreation. The portion of the Nanticoke River that flows past PLUS 2010-04-02 Nathaniel's Landing is part of the Captain John Smith Chesapeake National Historic Trail. The Captain John Smith Chesapeake National Historic Trail was authorized by Congress in 2006 so that visitors to the Chesapeake Bay can understand the significance of John Smith's explorations, and his interaction with and impact upon the rich Native American cultures. Moreover, visitors can come to appreciate and care for the life and landscape of this national treasure, America's largest estuary. The Trail follows Captain John Smith's voyages up the Nanticoke River. The Trail is a work in progress and comes as a result of the diligent work of many public and private partners. The Conservation Fund conducted a view-shed analysis of the Nanticoke River and gave a high ranking to the area directly adjacent to this proposed development. The developer is advised to protect this view-shed by maintaining at least a 100 ft setback along the river's edge. To further protect this area, the developer should consider a conservation easement along the Nanticoke River.

Dock restrictions. Restricting personal docks would be an additional step in protecting the historic viewshed. Placing a deed restriction on personal docks would limit the amount of disturbance along the

river's edge. Open Space Parcel 4 (located in between lots 37 and 38 could be used as an access area to a community dock and/or non-motorized watercraft launch site.

Additional comments on hunting. Hunting is a popular recreational activity in Western Sussex County where there is a limited number of public hunting areas. In May and June of 2008, the Division of Parks and Recreation conducted a telephone survey of Delaware residents to gather information and trends on outdoor recreation patterns and preferences as well as other information on their landscape perception. These findings are the foundation of the 2008-2011 Statewide Comprehensive Outdoor Recreation Plan (SCORP) providing guidance for investments in needed outdoor recreation facilities. The public opinion survey found that nearly a quarter (23%) of those residents surveyed in western Sussex County expected someone in their household to hunt within the next 12 months. Based on the popularity of hunting and the demand for publicly accessible hunting locations, the SCORP identifies a moderate need for public hunting areas in western Sussex County.

Due to habitat loss associated with increased development, humans and deer are intermixing more now than ever. This interaction can lead to conflicts such as crop damage, damage to shrubs, flowers and trees, decrease in ecosystem biodiversity, deer-vehicle collisions, and the spread of disease. In addition to providing a recreational opportunity, the Nanticoke Wildlife Area uses public hunting as a wildlife management technique to control the overabundant population of deer within the park.

Parks and Recreation comments by Kendall Sommers - (302) 739-9242, Kendall.Sommers@state.de.us

Air Quality recommendations. Measures may be taken to substantially reduce the air quality emissions and include:

- **Constructing only energy efficient homes.** Energy Star qualified homes are up to 30% more energy efficient than typical homes. These savings come from building envelope upgrades, high performance windows, controlled air infiltration, upgraded heating and air conditioning systems, tight duct systems and upgraded water-heating equipment. Every percentage of increased energy efficiency translates into a percent reduction in pollution.
- **Offering geothermal and/or photo voltaic energy options.** These systems can significantly reduce emissions from electrical generation, and from the use of oil or gas heating equipment.
- **Providing tie-ins to the nearest bike paths and links to any nearby mass transport system**. For every vehicle trip that is replaced by someone using a sidewalk, bike path or uses mass transit, it is estimated that 92 pounds of VOC and 96 pounds of NOx are reduced each year.

The following measures will reduce emissions associated with the actual construction phase of the development:

- **Using retrofitted diesel engines during construction**. This includes equipment that are on-site as well as equipment used to transport materials to and from site.

- **Using pre-painted/pre-coated flooring, cabinets, fencing, etc**. These measures can significantly reduce the emission of VOCs from typical architectural coating operations.
- **Planting trees at residential units and in vegetative buffer areas**. Trees reduce emissions by trapping dust particles and by replenishing oxygen. Trees also reduce energy emissions by cooling during the summer and by providing wind breaks in the winter, whereby reducing air conditioning needs by up to 30 percent and saving 20 to 50 percent on fuel costs.

This is a partial list, and there are additional things that can be done to reduce the impact of the development on air quality. The applicant is advised to contact DNREC Air Quality Management Section for measures that may be incorporated into the Nathaniel's Landing development. *Deanna Morozowich - (302) 739-9402, Deanna.Morozowich@state.de.us*