

Comments by division and program follow.

Fish and Wildlife

Rare Species. Our field 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:

We have records of Red-Headed Woodpecker (*Melanerpes erythrocephalus*) in the vicinity and rare species downstream including the federally listed plant *Helonias bullata* (swamp pink). Swamp pink appears to be sensitive to changes in water quality and could be impacted by run-off from this development.

Site Visit Request. In order to provide informed comments, our program scientists request the opportunity to conduct a survey of the property to evaluate habitat and determine the potential for species of greatest conservation need (SGCN). 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, species-habitat associations, and maps of key wildlife habitat. Please note that our scientists have decades of experience in comprehensive 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 Edna Stetzar at (302) 653-2880 ext. 101 or at Edna.Stetzar@state.de.us if the landowner will grant a site visit.

Forest Preservation. 2002 aerial photographs depict a forest that has been regenerating for some time now. While certainly not considered 'old growth' this site has not been harvested for a number of years and developing it will represent a loss of 75 acres of habitat for species that depend on early successional habitat. In addition, this forest is part of a larger forest block and forest fragmentation separates populations, gives advantage to invasive species, increases vulnerability to predation, and increases human/animal interactions especially on the roadways.

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 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.

Recommendations/Questions:

- According to the PLUS application, 45 acres of forest on tax parcel 230-20.00-12.00 will be set aside as open space (question #36). The applicant also indicated that this forested open space will be ‘enhanced to provide a natural setting for the community’. Community trails are mentioned, but what exactly does the ‘enhancement’ entail? If clearing is planned, the acreage should be included in the forest loss estimate (currently 75 acres out of 120 leaving 45 acres un- cleared, question #27).
- Is tax parcel #230-20.00-12.00 going to be permanently protected or can it still be used for future waste water, utilities, amenities, etc.? We recommend consideration be made for placing this parcel in a conservation easement or other mechanism that would result in permanent conservation. This effort could offset some of the impacts the development will have on this forest block and on those species currently utilizing it.
- Division of Fish and Wildlife scientists would like to offer assistance in the development of a plan to enhance tax parcel 230-20.00-12.00. Please note that our scientists have decades of knowledge and experience with Delaware’s native flora and fauna and could aide in the enhancement of habitat that would benefit native species. In addition, recommendations could be made so that enhancement efforts that include community amenities don’t impact habitat that supports those species.
- Although leaving a forest intact is usually more beneficial to the existing wildlife and is preferential to clearing, we recommend that clearing not be conducted April 1st to July 31st to reduce impacts to nesting birds and other wildlife species that utilize forests for breeding. This recommendation will only protect those species for one breeding season because once trees are cleared there is an overall loss of habitat.
- We recommend that efforts to minimize the amount of clearing needed for the footprint of homes and infrastructure be employed. If feasible, mechanisms should also be put in place to reduce future clearing by landowners.
- Methods of stormwater management that do not involve tree clearing should be discussed with the district engineer as well as other ways to reduce the need to clear trees for stormwater management.

Nuisance Geese. Wet ponds created for stormwater management purposes may attract resident Canada geese and mute swans that will create a nuisance for community residents. High concentrations of waterfowl in ponds create water-quality problems, leave droppings on lawn and paved areas and can become aggressive during the nesting season. Short manicured lawns around ponds provide an attractive habitat for these species.

Many applicants plan to control nuisance species with BMPs and vegetation design. We recommend that ‘vegetation design’ include native plantings of tall grasses, wildflowers, shrubs, and/or trees at the edge and within an adequate buffer (15-30 feet in width) around the ponds (planted in accordance with the Sediment and Stormwater Plan approval agency requirements).

This type of habitat is not as attractive to geese because their view of the surrounding area is blocked and they can't scan for predators.

At this time, we do not recommend using monofilament grids due to the potential for birds and other wildlife to become entangled if the grids are not properly installed and maintained. In addition, the on-going maintenance (removing entangled trash, etc.) may become a burden to the homeowners association.

The Division of Fish and Wildlife does not provide goose control services, and if problems arise, residents or the home-owners association will have to accept the burden of dealing with these species (e.g., permit applications, costs, securing services of certified wildlife professionals). Solutions can be costly and labor intensive; however, with proper landscaping, monitoring, and other techniques, geese problems can be minimized. *Edna Stetzar - (302) 653-2880, Edna.Stetzar@state.de.us*

Soil and Water

Sediment and Stormwater Program. A detailed sediment and stormwater plan will be required prior to any land disturbing activity taking place on the 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.

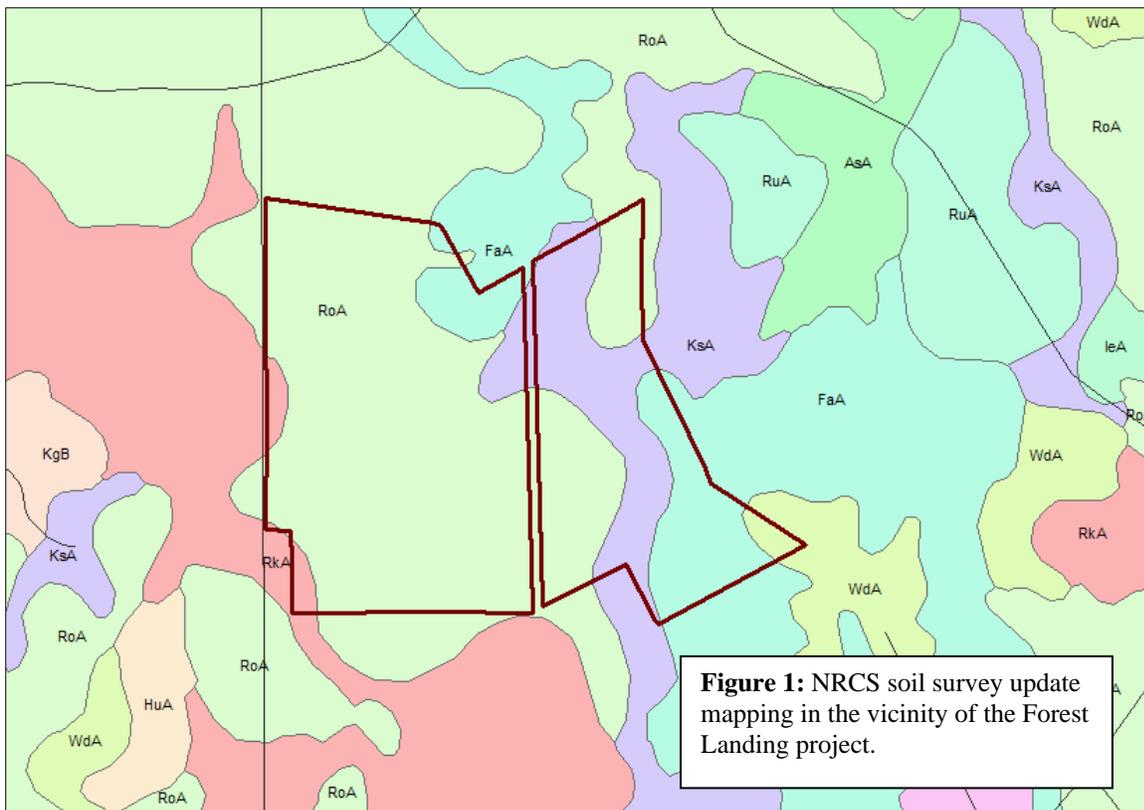
Drainage Program. This project is located within the School House Tax Ditch watershed; however, it is not affected by Tax Ditch rights-of-way.

The Drainage Program requests that the engineer take precautions to ensure the project does not hinder any off-site drainage upstream of the project or create any off site drainage problems downstream by the release of on site stormwater. From the submitted site plan it appears the project will outlet stormwater across Old State Road into Prong 1 of the School House Tax Ditch. The Drainage Program requests that the engineer check existing downstream ditches and pipes for function and blockages prior to the construction. Notify downstream landowners of the change in volume of water released on them.

Since annexation into the Town of Ellendale is being actively pursued, stormwater conveyances should be located within street right-of-ways or open space. Drainage easements on private property should be recorded on deeds and place restrictions on obstructions within the easements to ensure access for periodic maintenance or future re-construction. Future property owners may not be aware of a drainage easement on their property if the easement is only on the record plan. However, by recording the drainage easement on the deed, the second owner, and any subsequent owner of the property, will be fully aware of the drainage easement on their property.

Water Resources

Soils Assessment. According to the NRCS soil survey update Rosedale (RoA), Rockawalkin (RkA), Klej (KsA), and Fallsington (FaA) were mapped in the immediate vicinity of the proposed construction. Rosedale is a well-drained upland soil that, generally, has few limitations for development. Rockawalkin and Klej are somewhat poorly-drained soils found on settings transitional between upland and wetland soil environments; consequently, they are likely to have moderate to severe limitations for development. Fallsington is a poorly-drained wetland associated (hydric) soil that has severe limitations for development (Figure 1).



Wetlands. According to the Statewide Wetlands Mapping Project (SWMP) maps palustrine scrub-shrub wetlands (PSS4A) were mapped on subject parcel (Figure 2). It is also likely that some unmapped wetlands may likely be found on some portions of the Fallsington and Klej soil mapping units (Figure 1).

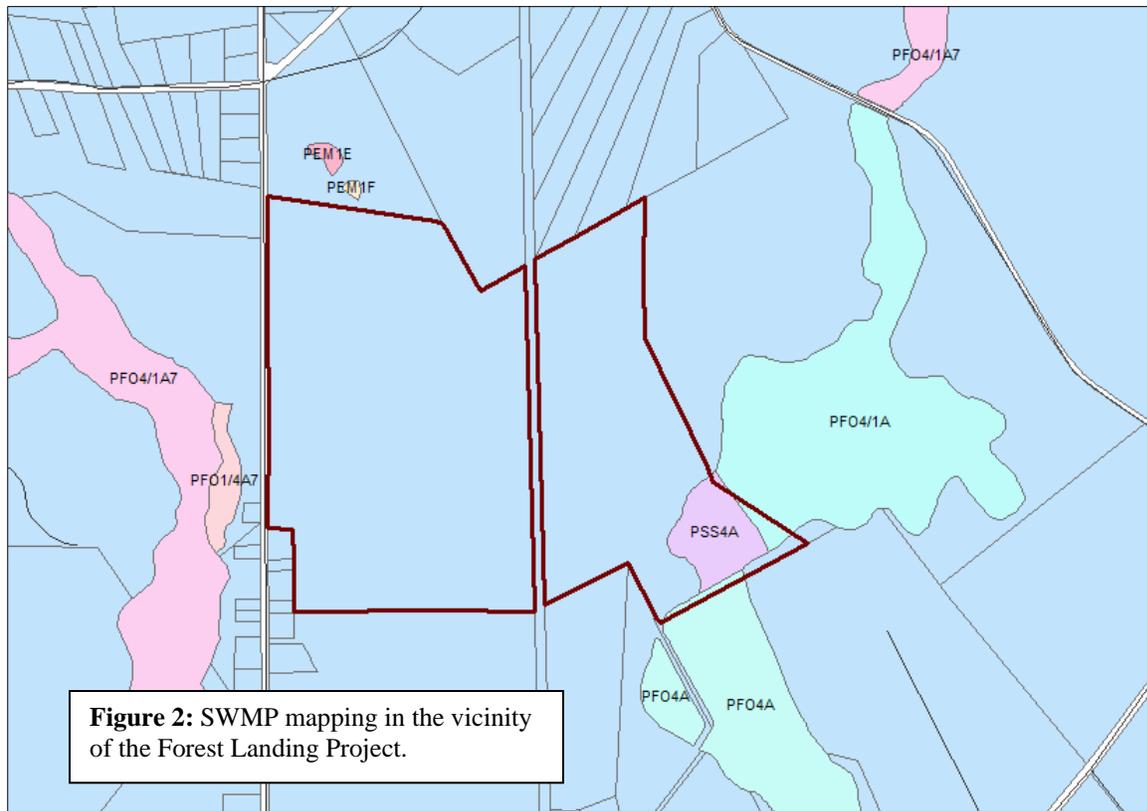


Figure 2: SWMP mapping in the vicinity of the Forest Landing Project.

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.

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.

Impervious Surfaces and Best Management Practices. Based on the information presented by the applicant in the PLUS application, this project’s post-construction estimate for surface imperviousness should not exceed 38%. Studies have shown a strong relationship between increases in impervious cover to decreases in a watershed’s overall water quality. 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 additional tree plantings are some examples of practical BMPs that could easily be implemented to help reduce surface imperviousness.

TMDLs. Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus have been promulgated through regulation for the Mispillion watershed. 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 water quality standards to the extent necessary to support use goals such as, swimming, fishing, drinking water and shell fish harvesting. Although TMDLs are

required by federal law, states are charged with developing and implementing standards to support these desired use goals. In the Mispillion watershed, “target-rate-nutrient reductions” of 57 percent from baseline conditions will be required for nitrogen and phosphorus. Additionally, “target-rate-reductions” of 87 percent from baseline conditions will be required for bacteria.

A Pollution Control Strategy (PCS) will be used as a regulatory framework to ensure that these nutrient reduction targets are attained. The Department has developed an assessment tool to evaluate how your proposed development may reduce nutrients to meet the TMDL requirements. Additional nutrient reductions may be possible through the implementation of BMPs such as increasing the amount of passive, wooded open space (planted with native woody and herbaceous vegetation), use of pervious paving materials to reduce surface imperviousness, and the deployment of green-technology stormwater management treatment technologies. 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 Supply. The information provided indicates that Tidewater Utilities will provide well water to the proposed project through a public water system. Our files reflect that Tidewater Utilities does not currently hold a Certificate of Public Convenience and Necessity (CPCN) to provide public water in these areas. They will need to file an application for a CPCN with the Public Service Commission, if they have not done so already. Information on CPCN requirements and applications can be obtained by contacting the Public Service Commission at 302-736-7547. Should an on-site public well be needed, it must be located at least 150 feet from the outermost boundaries of the project and a minimum isolation distance of 150 feet is required between the well and any potential source of contamination, such as a septic tank and sewage disposal area. 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 Regulations Governing the Construction and Use of Wells. A well construction permit must be obtained prior to constructing any wells.

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*

Parks and Recreation

Natural Areas. The forested portions of these parcels are currently listed on Delaware’s Natural Areas Inventory. Natural Areas contain lands of statewide significance identified by the Natural

Areas Advisor Council as important natural land remaining in Delaware. The developer should investigate dedicating the remaining protected forest within this project as a Nature Preserve through a conservation easement or donation of land.

Trails. If the forested land on the east side of this project will have passive recreational trails, as stated in Question 33 of the PLUS application, how will people access these trails? The eastern parcel is separated by a rail line preventing easy access for residents of the community. Should there be any questions regarding trail design or layout, please contact the Delaware Division of Parks and Recreation, David Bartoo, Trail Specialist at 302-739-9235. *Kendall Sommers - (302) 739-9242, Kendall.Sommers@state.de.us*

Air and Waste

Air Quality. Housing developments may unnecessarily emit, or cause to be emitted, significant amounts of air contaminants into Delaware’s air, which will negatively impact public health, safety and welfare. These negative impacts are attributable to:

- Emissions that form ozone and fine particulate matter; two pollutants relative to which Delaware currently violates federal health-based air quality standards,
- The emission of greenhouse gases which are associated with climate change, and
- The emission of air toxics.

Air emissions generated from housing developments include emissions from:

- Area sources like painting, lawn and garden equipment and the use of consumer products like roof coatings and roof primers.
- The generation of electricity needed to support the homes in your development, and
- Car and truck activity associated with the homes in your new development.

These three air emissions components (i.e., area, electric power generation, and mobile sources) are quantified below, based on a per household/residential unit emission factor that was developed using 2002 Delaware data. These emissions in the table represent the actual impact the Forest Landing development may have.

Emissions Attributable to Forest Landing Subdivision (Tons per Year)

	Volatile Organic Compounds (VOC)	Nitrogen Oxides (NOx)	Sulfur Dioxide (SO ₂)	Fine Particulate Matter (PM _{2.5})	Carbon Dioxide (CO ₂)
Direct Residential	12.4	1.4	1.1	1.5	50.1
Electrical Power Generation	ND*	4.9	17.0	ND*	2,511.4
Mobile	18.3	19.1	0.6	0.2	11,792.4
Total	30.7	25.4	18.7	1.7	14,353.9

(*) Indicates data is not available.

Note that emissions associated with the actual construction of the subdivision, including automobile and truck traffic from working in, or delivering products to the site, as well as site preparation, earth moving activities, road paving and other miscellaneous air emissions, are not reflected in the table above.

Recommendations:

The applicant shall comply with all applicable Delaware air quality regulations. These regulations include:

<p>Regulation 6 - Particulate Emissions from Construction and Materials Handling</p>	<ul style="list-style-type: none"> • Using dust suppressants and measures to prevent transport of dust off-site from material stockpile, material movement and use of unpaved roads. • Using covers on trucks that transport material to and from site to prevent visible emissions.
<p>Regulation 1113 – Open Burning</p>	<ul style="list-style-type: none"> • Prohibiting open burns statewide during the Ozone Season from May 1-Sept. 30 each year. • Prohibiting the burning of land clearing debris. • Prohibiting the burning of trash or building materials/debris.
<p>Regulation 1145 – Excessive Idling of Heavy Duty Vehicles</p>	<ul style="list-style-type: none"> • Restricting idling time for trucks and buses having a gross vehicle weight of over 8,500 pounds to no more than three minutes.

Additional measures may be taken to substantially reduce the air emissions identified above. These measures 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. The Energy Star Program is excellent way to save on energy costs and reduce air 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.** These measures can significantly reduce mobile source emissions.
- **Funding a lawnmower exchange program.** New lawn and garden equipment emits significantly less than equipment as little as 7 years old, and may significantly reduce

emissions from this new development. The builder could fund such a program for the new occupants.

Additionally, 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 should submit a plan to the DNREC Air Quality Management Section which address the above listed measures, and that details all of the specific emission mitigation measures that will be incorporated into the Forest Landing development. Air Quality Management Section points of contact are Phil Wheeler and Deanna Morozowich, and they may be reached at (302) 739-9402. *Deanna Morozowich - (302) 739-9402, Deanna.Morozowich@state.de.us*

Hazardous Waste Sites. DNREC's Site Investigation and Restoration Branch (SIRB) has reviewed the proposed project. No SIRB sites or salvage yards were found within a ½-mile radius of the proposed development. However, based on the previous agricultural use of the proposed project site, which may have involved the use of pesticides and herbicides, SIRB recommends that a Phase I Environmental Site Assessment be performed prior to development. In addition, should a release or imminent threat of a release of hazardous substances be discovered during the course of development (e.g., contaminated water or soil), construction activities should be discontinued immediately and DNREC should be notified at the 24-hour emergency number (800-662-8802). SIRB should also be contacted as soon as possible at 302-395-2600 for further instructions. *Krystal Stanley - (302) 395-2644, Krystal.Stanley@state.de.us*