

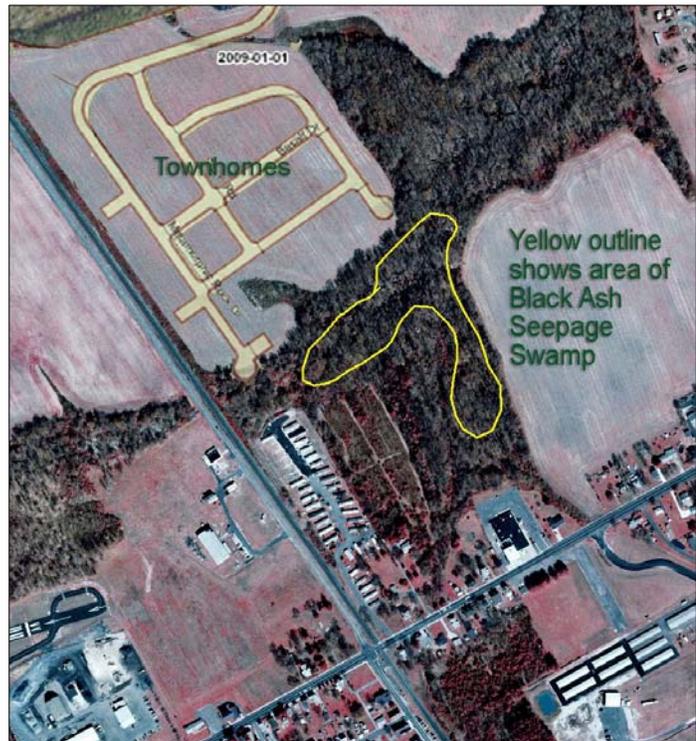
DNREC notes several concerns about the proposed project:

- By reconfiguring and adding streets, along with increasing density by the addition of duplexes and townhomes, a new sediment and stormwater plan must be submitted. Because of problems while this site has been under construction, the Kent Conservation District has turned the inspection and review of the subdivision over to DNREC.
- With the increased density and relatively steep topography, we are concerned that an underestimation of post-construction impervious cover could result in flooding and erosion.
- The Floodplain for Alston Branch is Zone A. No Base Flood Elevation has been established for this portion of the stream. If any portion of this property lies within the floodplain, a detailed flood study needs to be done to establish a base flood elevation. Cheswold is a participating community in the National Flood Insurance Program and has adopted a floodplain ordinance. One of the minimum requirements is that for any parcel greater than 5 acres or 50 lots, a base flood elevation must be established.
- In the area across from a Black Ash Seepage Swamp containing rare species (see map below), we recommend a 100-foot buffer. There should be no lot lines or infrastructure within this buffer zone.

Comments by division and program follow.

Fish and Wildlife

Rare species. According to our database there are 12 rare plants within a Black Ash Seepage Swamp community along Alston Branch. This plant community was nearly destroyed by land clearing activities for another development. These rare plants still persist but the habitat is severely degraded and has not recovered from the disturbance. The current plan indicates that wetland buffers are 50 feet in width. We recommend the applicant consider increasing the buffer to 100 feet in order to protect the rare plant community and water quality within the stream system. Redesigning the site or omitting lots and infrastructure within 100 feet of wetlands would be necessary to achieve this goal. Forested areas along water courses are used by wildlife for feeding, breeding, resting and as a travel corridor linking habitat. There should not be lot lines or infrastructure within this buffer zone and it should be placed in permanent conservation so that future clearing is less likely to occur.



Nuisance Species. Wet ponds created for stormwater management purposes may attract resident Canada geese. 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. Exclusion is one of the most effective methods at deterring geese. In a commercial setting, completely fencing the pond at the edge (even one foot high) may be feasible. Even though geese can fly over the fence, if they constantly have to fly between land and water the area is less desirable. If fencing is not a desired option, we recommend native plantings, including tall grasses, wildflowers, shrubs, and trees at the edge and within an adequate buffer (15-30 feet in width) around the ponds. When the view of the surrounding area from the pond is blocked, geese can't scan for predators and are less likely to reside and nest in the area of the pond. The vegetation also blocks the ability to easily move between land and water.

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 landowner or property manager.

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 Conservation

Sediment and Stormwater. A new detailed sediment and stormwater plan will be required for this project. The current sediment and stormwater plan has been referred back to the Department, therefore, please contact the Sediment and Stormwater Program to schedule a meeting to discuss the sediment and erosion control and stormwater management components of the new 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 Division of Soil and Water Conservation, Sediment and Stormwater Program. Contact Jamie Rutherford of the Sediment and Stormwater Program at (302) 739-9921 for details regarding submittal requirements and fees.

Because of the parcel's location in an impaired watershed and the amount of impervious surface, green technology BMPs and low impact development practices should be considered a priority to reduce stormwater flow and to meet water quality goals.

Drainage Program. 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 onsite storm water. 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.

Have all drainage easements 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. *Soil and Water - James Sullivan - (302) 739-9921, James.Sullivan@state.de.us*

Flood management. The Floodplain for Alston Branch is Zone A. No Base Flood Elevation has been established for this portion of the stream. If any portion of this property lies within the floodplain, a detailed flood study needs to be done to establish a base flood elevation. Cheswold is a participating community in the National Flood Insurance Program and has adopted a floodplain ordinance. One of the minimum requirements is that for any parcel greater than 5 acres or 50 lots, a base flood elevation must be established. We recommend the detailed flood

study be submitted to FEMA for approval so the FIRM panel can be amended with a physical map change. *Soil and Water - Gregory Williams - (302) 739-9921, Gregory.Williams@state.de.us*

Water Resources

Water allocation. The project information sheets state water will be provided to the project by Tidewater Utilities via a public water system. Our records indicate that the project is located within the public water service area granted to Tidewater Utilities under Certificate of Public Convenience and Necessity PSC-1464.

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. *Rick Rios, 302-739-9945, Ricardo.Rios@state.de.us*

Soils. According to the NRCS soil survey update Sassafras (SaB, 2-5% slopes), Downer (DoC, 5-10% slopes), Hambrook (HbB, 2-5% slopes), Fallsington (FgA), and Zakiah were mapped on subject parcel(s). Sassafras, Downer, and Hambrook are well drained uplands soils that, generally, have few limitations for development. Fallsington and Zakiah are poorly to very poorly drained soils (hydic) associated with wetlands, and should be avoided (Figure 1).

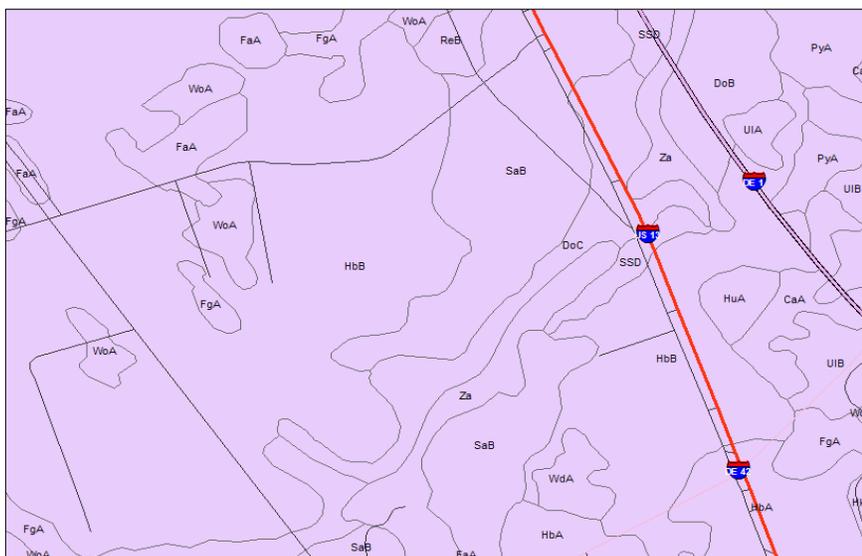


Figure 1: NRCS soil survey update mapping in the vicinity of the Stonington mixed use plan development.

Wetlands. According to the Statewide Wetland Mapping Project (SWMP) mapping, palustrine riparian wetlands (PF01A7 & C7). (See figure 2).



Figure 2: SWMP mapping in the immediate vicinity of the Stonington mixed use development.

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.

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 also subject to regulatory requirements specified 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) manual is the basis for making a jurisdictional wetland determination for nontidal wetlands in Delaware. The applicant is forewarned that the USACE views the use of the National Wetlands Inventory (NWI) mapping or the Statewide Wetlands Mapping Project (SWMP) mapping as an unacceptable substitute for a field-based jurisdictional wetland delineation (i.e., 1987 USACE manual).

To ensure compliance with said USACE 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 USACE 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 (as asserted by the applicant in the PLUS application), the USACE 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 USACE. The USACE can be reached by phone at 736-9763.

Palustrine headwater water riparian wetlands associated with the Alston Branch tributary bound much of the southern boundary of the proposed project area. Headwater riparian wetlands serve to protect water quality which helps maintain the ecological integrity and functions throughout the length of the stream, including the floodplain system and/or water bodies further downstream. Since headwater riparian wetlands serve as natural buffers that protect the water and habitat quality of streams from sediment and nutrient-laden runoff, their protection deserves the highest priority. Therefore, the Watershed Assessment Section strongly recommends that a 100-foot upland buffer be maintained or established from all of the riparian wetlands bounding Alston Branch. A literature review of existing buffer research by Castelle et al. (1994) has documented consensus among researchers that a 100-foot upland buffer is the minimum buffer width necessary- under most circumstances - to protect water quality.

Impervious Surfaces and BMPs. Based on a review of the PLUS application, post-construction surface imperviousness was projected to reach 55 percent. However, given the projected scope and density of this project, this estimate appears to likely understate post-construction surface imperviousness. When calculating surface imperviousness, it is important to consider all created forms of constructed surface imperviousness (i.e., rooftops, sidewalks, roads, lined ponds, and stormwater management structures) in the calculation for surface imperviousness; otherwise, an inaccurate assessment of this project's environmental impacts will result. Surface imperviousness should be recalculated if the above-mentioned forms of constructed surface imperviousness were not included.

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 Leipsic River watershed, although no regulations for this watershed have been adopted yet. 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 Leipsic River watershed, “target-rate-nutrient reductions” of 40 percent for both nitrogen and phosphorus are required. Additionally, “target-rate-reductions” of 75 percent will be required for bacteria.

TMDL compliance through the PCS. As indicated above, Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus have been proposed for the Leipsic River watershed. The TMDL calls for a 40 percent reduction in nitrogen and phosphorus from baseline conditions. The TMDL also calls for a 75 percent reduction in bacteria. A pollution control strategy 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), wider vegetated buffers along watercourses, 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.

Literature cited

Castelle, A. J., A. W. Johnson and C. Conolly. 1994. *Wetland and Stream Buffer Requirements – A Review*. J. Environ. Qual. 23: 878-882.

Comments for the Wetlands and Subaqueous Lands Section and Wetlands, Soil Assessment and Small Systems Permitting Branches were provided by John Martin, 302-739-9939, John.Martin@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 Stonington development may have.

Emissions Attributable to Stonington 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	22.9	2.5	2.1	2.7	93.0
Electrical Power Generation	ND*	9.1	31.6	ND*	4,663.9
Mobile	56.9	47.1	34.7	3.1	4,756.9
Total	79.8	58.7	68.4	5.8	9,513.8

(*) 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.

Air Quality Recommendations:

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

<p>Regulation 1106 - 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 low VOC emitting trees at residential units and in vegetative buffer areas.** Trees on the list below 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.

Low VOC Emitting Trees for Delaware

American Elm	Red Hickory
Black Cherry	Red Maple
Black Locust	Red Mulberry
Black Walnut	Redbud
Choke Cherry	Sassafras
English Walnut	Green Ash
Red Bay	Silver Maple

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 Stonington development. *Air Quality Management Section points of contact are Phil Wheeler and Deanna Morozowich, and they may be reached at (302) 739-9402.*

Hazardous waste sites. Two (2) Site Investigation & Restoration Branch (SIRB) sites were found within a half mile radius of the proposed site: Coker’s Landfill #3 (DE-0003) located 127 meters southwest, and Grigco Waste Oil & Recycling (DE-0124) bordering the east side of the proposed site.

Coker’s Landfill was used by Dow Reichhold for the disposal of latex rubber sludge’s. The landfill was given a No Further Action (NFA) designation in 12/1990. Grigco Waste Oil & Recycling was referred to the Division of Water Resources for a potential oil contamination of the surface water. The site was given a NFA designation in 1992.

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*

Tank management. The Delaware Department of Natural Resources and Environmental Control-Tank Management Branch (TMB) appreciates the opportunity to comment on the proposed development. The parcel ID provided within the PLUS system could not be matched to a polygon with DNREC's GIS system; therefore, the project was based on the closest match, Parcel ID: LC03-046.02-03-01.00. There is one inactive LUST site located within a quarter mile of the proposed project.

Name: Jo Eve Farms Inc.

Facility ID: 1-000222

Project: K9301011

No environmental impact is expected from the above inactive LUST sites. However, should any underground storage tanks or petroleum contaminated soil be discovered by any person during construction, the DNREC-TMB at (302) 395-2500 and the DNREC Emergency Response Hotline at (800) 662-8802 must be notified within 24 hours.

Should any unanticipated contamination be encountered, PVC pipe materials would have to be replaced with ductile steel and nitrile rubber gaskets in the contaminated areas.

Also, please note that if any aboveground storage tanks (ASTs) less than 12,500 gallons are installed, they must be registered with the TMB. If any ASTs greater than 12,500 gallons are installed, they are also subject to installation approval by the TMB. *Tank Management Branch - Elizabeth Wolff - (302) 395-2500, Elizabeth.Wolff@state.de.us*