PLUS 2009-10-02 Spring Hall

A well-designed mixed-use development linked to the town would be an appropriate land use in an existing community such as Frederica. However, this maximum-yield project affects several environmentally sensitive features and would lie in a watershed where pollution-control limits have been established to improve water quality.

Overall recommendations:

1) In the interest of water quality and to protect rare species and sensitive wetlands, the existing forest should be left intact. At the very least, a 100-foot upland buffer should be left along Spring Creek and associated wetlands and tributaries. The current site plan depicts buffer widths much less than what is ecologically needed to maintain habitat and protect water quality.
    a. This buffer should not contain lot lines or infrastructure (i.e. there should be at least a 100-foot buffer between wetlands and lots, roadways, stormwater ponds). We note several lots within 100 feet of wetlands: Lots L 8-12, L 13-17, L 19-20, L 43-46, L 51-56, L 60, D 15-21, D 23-28, D 31-32 and D 44-46.
    b. In addition, the impervious roadway between lots L 19 and L 20 are within 50 feet of wetlands.
    c. 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.
    d. To ensure compliance with the Army Corps of Engineers' 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.
2) Green-technology best-management practices should be used because of the parcel's location in an impaired watershed and the high percentage of impervious cover; low-impact development practices should be considered a priority to reduce stormwater flow and to meet water-quality goals. These practices include but are not limited to porous pavements, swales, bio-retention ponds, rain gardens, and roof top drains to infiltration facilities.
3) The highly impervious commercial section of the project includes a delineated excellent recharge area. DNREC recommends:
    a. Limit impervious cover to 20% of that area within the portion of the parcel in the excellent ground-water recharge potential area; or;

b. Allow no more than 50% impervious cover of that area within the portion of the parcel within the excellent ground-water recharge potential area if an environmental assessment documents that post-development recharge is equal to or greater than pre-development recharge when computed on an annual basis; and/or
c. Either move some or all of the commercial area outside of the excellent recharge zone or redistribute the townhomes so they are not segregated from the other housing styles, a design that would be both more in the character of traditional neighborhood design and less impervious; and
d. Move the stormwater pond out of the delineated excellent recharge area.

4) We recommend that the existing forest on this site be left intact as it serves as wildlife habitat, a wildlife travel corridor and a riparian buffer zone. Cumulative impacts regarding forest loss and wetland degradation is a real concern considering the number of in-progress or proposed developments in this area. In addition, as forests are cleared, wildlife must disperse into the surrounding area which often leads to human/animal conflicts, including interactions on the roadways.

Additional and more detailed comments by division and program follow.

Fish and Wildlife

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 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.

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.

Rare Species. There are records of Lycaena hyllus (bronze copper), a state-rare (ranked as an S2-very rare within the state with 6-20 occurrences) butterfly within scrub-shrub wetlands that border Spring Creek. Because this same type of habitat exists within the project area, this species could be present within the project area as well. In addition, this type of wetland is very significant as it is becoming quite rare in Delaware. Inadequate upland buffers, such as proposed with this project, could be detrimental to this wetland type and to species that depend upon those wetlands.

Tidal shrub wetlands are transitional between emergent wetlands and forested wetlands and posses many important wetland values and functions, as well as providing important habitat for an array of wildlife species. Specific hydrologic, edaphic, and typographical conditions must be in place in order for tidal shrub wetlands to develop. If these conditions are disturbed or changed in any way from land-use

changes, the potential exists for community structure and plant species composition to shift in an unfavorable direction.

Key Wildlife Habitat. The forest on this property is mapped as Key Wildlife Habitat in the Delaware Wildlife Action Plan (DEWAP). DEWAP 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 as well as species-habitat associations.

The current site plan will result in direct impacts to Key Wildlife Habitat by clearing. The forested areas that are not cleared outright are going to be largely fragmented by stormwater ponds, roads, and lots. Forested lots will also be subject to further clearing by homeowners who want amenities such as dog kennels, swimming pools, sheds, etc. Clearing restrictions placed on homeowners can be hard to enforce and still do not prevent fragmentation of an intact forest. Essentially this project will result in the conversion of 61 acres of forested habitat into a residential area.

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. It is strongly recommended that the owner and consultant contact the Kent Conservation District to schedule a pre-application meeting to discuss the sediment and erosion control and stormwater management components of the plan. 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 Kent Conservation District. Contact Jared Adkins, Program Manager, at the Kent Conservation District at (302) 741-2600, ext. 3 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.

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.

Preserve existing riparian buffers on this site to aid in the reduction of nutrients, sediment, and other pollutants entering the watershed. Please explore methods to filter excess nutrients in stormwater runoff from this site before releasing the stormwater into the watershed.

The Drainage Program does not support the removal of trees for the creation of stormwater management areas.

Sediment/Stormwater and Drainage comments provided by James Sullivan - (302) 739-9921, James.Sullivan@state.de.us

Water Resources

Soils Assessment. According to the Sussex County soil survey Downer (DoB), Ingleside (IgA & IgB), Sassafras (SSD; 10-15% slope), and Hurlock were mapped in the immediate vicinity of the proposed construction (Figure 1). Downer and Ingleside are well-drained upland soils that, generally, have few limitations for development. Sassafras has severe limitations for development because of steeply-sloping topography. Hurlock is a poorly-drained wetland associated (hydric) soil that has severe limitations for development and should be avoided.

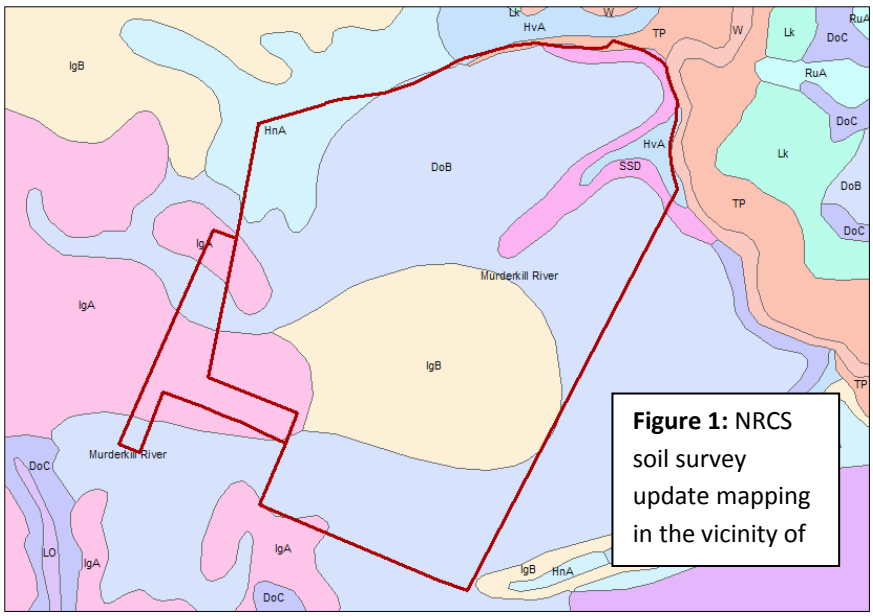


Figure 1: NRCS soil survey update mapping in the vicinity of

Wetlands. According to the Statewide Wetland Mapping Project (SWMP) mapping, nontidal and tidally-influenced palustrine wetlands were mapped on subject parcel. The nontidal wetlands are palustrine wetlands and were symbolically designated on the SWMP map as follows: PFO1C7, PFO1/4C, and PFO1C. The tidally influenced wetlands are palustrine and estuarine wetlands and were symbolically designated on the map as follows: PFO1/SS3R and PSS1/EM1R, E2EM1N & E2UBL. Headwater riparian wetlands are found within and along much of the northeastern boundary of the parcel(s).

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. Since this parcel contains State-regulated tidally-influenced wetlands, the State Wetlands section should be contacted prior to commencing any development activities.

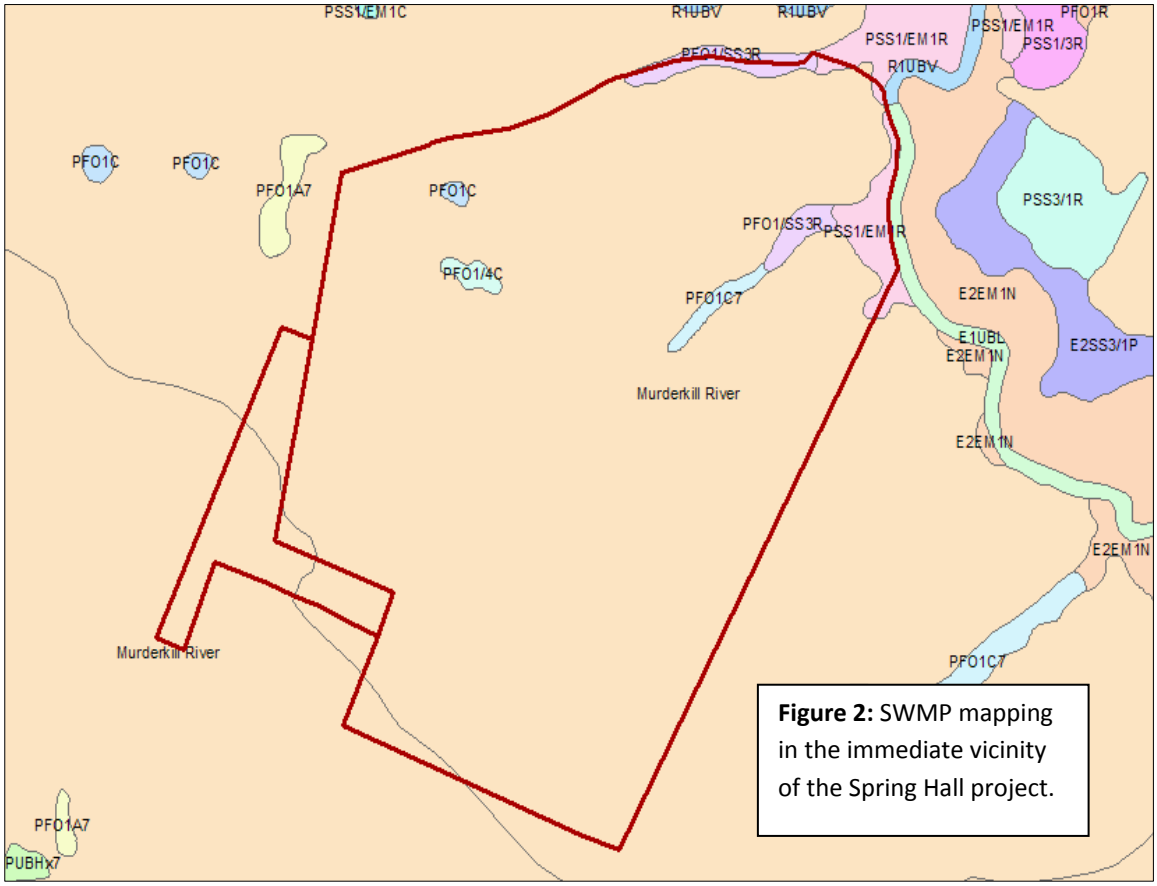


Figure 2: SWMP mapping in the immediate vicinity of the Spring Hall project.

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. A potential ditch may be bisecting this parcel and draining to Providence Creek. An on-site jurisdictional determination should be conducted to determine whether this water body is subject to State regulatory jurisdiction under the

Subaqueous Lands Act. 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.

As noted previously, the palustrine headwater water riparian wetlands bound the northeastern boundary of subject parcel. 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 steams from sediment and nutrient-laden runoff, their protection deserves the highest priority.

TMDLs. Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus have been promulgated through regulation for the Murderkill River 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

Murderkill River watershed, "target-rate-nutrient reductions" of 30 and 50 percent will be required for nitrogen and phosphorus, respectively. Additionally, "target-rate-reductions" of 32 percent 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), wider vegetated buffers along watercourses, use of pervious paving materials to reduce surface imperviousness, and the deployment of green-technology stormwater management treatment technologies.

While a regulation has not been established for the Murderkill watershed, projects are still required to meet these nutrient reductions. 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 project information sheets state water will be provided to the project by Artesian Water Company via a public water system. Our records indicate that the project is located within the public water service area granted to Artesian Water Company under Certificate of Public Convenience and Necessity (CPCN) 05-CPCN-01.

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.

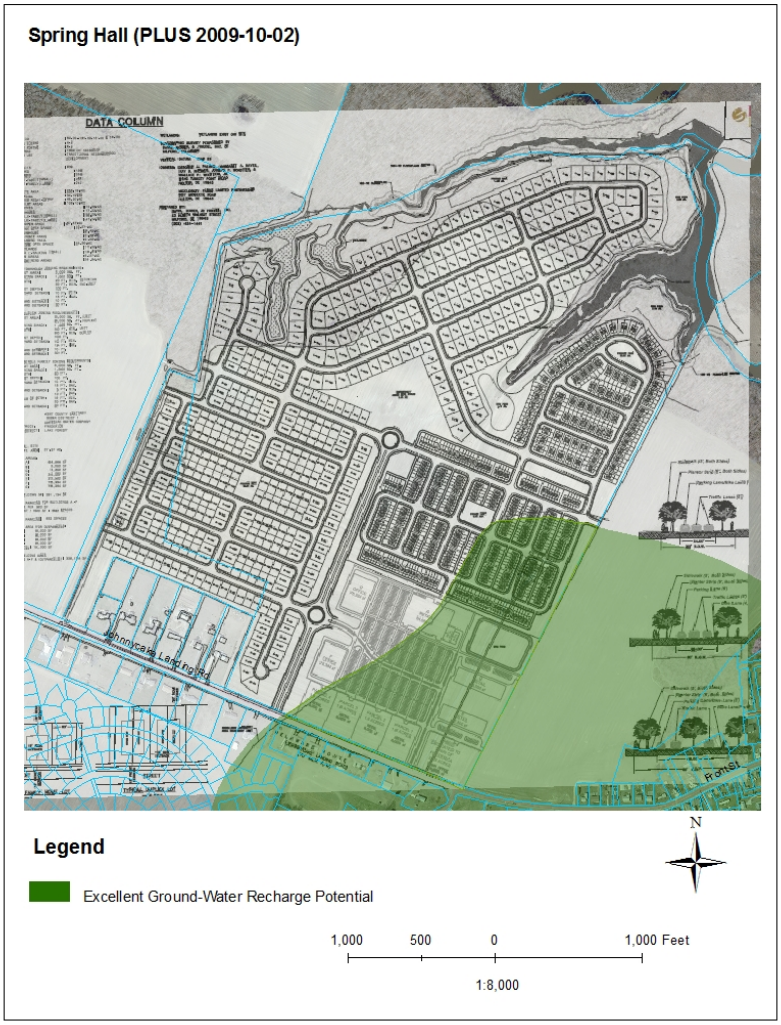
All well permit applications must be prepared and signed by licensed water well contractors, and only licensed well drillers may construct the wells. Please factor in the necessary time for processing the well permit applications into the construction schedule. Dewatering well permit applications typically 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*

Water Resource Protection Areas. The DNREC Ground-Water Protection Branch (GPB) has reviewed the above referenced PLUS project and determined that it falls within an excellent ground-water recharge area for the Town of Frederica (see map below). The site plan shows stormwater management ponds in the area of excellent recharge. The Town of Frederica adopted Water Resource Protection measures as Article 12 Section 12-1, of their Land Development Ordinance in 2005. The ordinance is not protective of the resource.

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 application states that the proposed development would change the impervious cover from zero to 51.34%. This calculation is based on the total area of the two parcels not just the area within the excellent ground water recharge potential area.

It appears that the amount of impervious cover within the area of excellent recharge potential exceeds the 20% limit recommended by DNREC (DNREC, 2005). Additionally it appears to exceed the 50% upper limit allowed if an environmental assessment documents that post-development recharge is equal to or greater than pre-development recharge when computed on an annual basis (Kauffman, 2005). In addition, the five parcels bordering Johnnycake Landing Road will increase the amount of impervious cover when developed.



Constructing stormwater management ponds within an area of excellent ground-water recharge potential can damage the resource. The construction phase of stormwater 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 carry contaminates into the aquifer.

Anne Mundel - (302) 739-9945, Anne.Mundel@state.de.us

Parks and Recreation

Riparian Buffer Area Trail. At the PLUS meeting, the Project Designer/Engineer spoke about a concrete or blacktop trail through the riparian buffer area. 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 Spring Hall development may have.

Emissions Attributable to Spring Hall 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	29.1	3.2	2.7	3.4	117.8
Electrical Power Generation	ND*	11.5	40.1	ND*	5,910.2
Mobile	43.0	44.9	1.3	0.5	27,752.1

Total	72.1	59.6	44.1	3.9	33,780.1

(*) *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:

Regulation 6 -Particulate Emissions from Construction and Materials Handling	• **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**.
Regulation 1113 – Open Burning	• **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.**
Regulation 1145 – Excessive Idling of Heavy Duty Vehicles	• **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. 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*

Tank Management Branch. There are no LUST project sites located within a quarter mile from the proposed project. No environmental impact is anticipated; 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 contamination be encountered, PVC pipe materials will 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. *Elizabeth Wolff - (302) 395-2500, Elizabeth.Wolff@state.de.us*

Note: The PLUS application stated that the project does not impact a sourcewater protection area; in fact, the most intensive and impervious commercial development is over an excellent recharge area (see map). Also, the application stated that the project does not border preserved land, such as an agricultural preservation district (question 34). It is bordered on the west by a preserved farm and on the north and northwest by state forest and forested easements, according to state GIS maps.