

Plans for this parcel have been submitted four times through PLUS, and DNREC is unaware of any responses from the developer to State comments. The responses are required, and they would help DNREC and other agencies know explicitly if their suggestions are being incorporated into successive versions of this project. Because reviewing projects requires a great deal of staff time from many different programs, we request a response to our comments and specific questions, as required by Delaware Code Title 29, Chapter 92:

Following the pre-application review process and upon filing of an application with the local jurisdiction, the applicant shall provide to the local jurisdiction and the Office of State Planning Coordination a written response to comments received as a result of the pre-application process, noting whether comments were incorporated into the project design or not and the reason therefore.

## **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:

There is a fairly extensive Atlantic White Cedar wetland community just downstream that could be impacted by runoff from this development. Atlantic white cedar communities typically grow under unique conditions and provide a refuge 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 adequate upland buffers are essential to the persistence of this State-rare community.

*Recommendation:* Upland buffers between Raccoon Branch (and associated wetlands) and lots/infrastructure should be at least 100 feet in width (preferably 300 feet in width for this sensitive wetland community). The buffer is needed to protect water quality which is important for the continued persistence of the State-rare community described above. In addition, forested areas along water courses are utilized by wildlife for resting, foraging and breeding and as a travel corridor.

**Forest Preservation.** The site plan appears to have a larger footprint than the last PLUS application (2008-09-14) yet, forest loss is estimated to be less (56.93 acres instead of 120.1 acres). For both PLUS projects, the project area is the same (260 acres) and the amount of units are the same (390), yet the amount of forest that exists on-site is estimated to be 111.41 instead of the previous figure of 138.5. Forest loss estimates used for the current site plan appear to be incorrect and clarification of how the figures were obtained would be useful. Also, it is indicated that a wastewater treatment facility will be used; however, the location of this facility is not depicted on the site plan. Will this facility result in additional forest loss not included in the

overall estimate? Are there other amenities or site features that are not depicted on the site plan that will result in additional forest loss?

Although there has been some level of harvest in the past, this forest does provide habitat for wildlife and if left intact will mature. 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](http://www.fw.delaware.gov) and the Delaware Code, Title 7). Because of an overall lack of forest protection, we have to rely on landowners/developers and/or the entity that approves projects (i.e. counties and municipalities) to consider implementing recommendations that will aide in reducing forest loss.

*Recommendations:*

Preservation of the forest is an option. There are incentive-based programs for wildlife management available to private landowners through our agency. Please contact Shelley Tovell at (302) 735-3605 if the landowner(s) is interested in more information. Also, our botanist, Bill McAvoy (302-653-2880) can assist the applicant in developing a plant list for wildlife habitat restoration efforts on this site if desired.

If preservation of existing forest resources is not going to be considered, then we offer the following recommendations:

1. Consideration should be made for downsizing this development or revising the site plan to reduce the footprint of the project that occurs within the forest. Concentrating most, if not all, of the lots in the non-forested area would be preferred.
2. Stormwater management options that do not involve tree clearing should be explored and implemented if deemed feasible by the district engineer or entity that approves the stormwater and erosion plan.
3. Trees should not be cleared from April 1st to July 31st to minimize impacts to birds and other wildlife that utilize forests for breeding. This recommendation would only protect those species for one breeding season, because once trees are cleared, the result is an overall loss of habitat.

**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.

Fountains are proposed in two of the stormwater ponds. Fountains, although aesthetically pleasing, are not considered effective at deterring geese.

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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.

*Recommendation:* We recommend plantings of native species of 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 congregate and nest in the area of the pond.

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 or land manager.

**Potential Hunting Issue.** Because the project parcel is part of a larger forest block and adjacent to forested parcels, legal hunting activities may take place on adjacent properties. Hunting within 100 yards of a dwelling is prohibited and the applicant should contact adjacent landowners to determine if this is going to be an issue. In effect, the adjacent landowner will be losing 100 yards of their property for hunting if there is not a buffer between lot lines and the adjacent property line. There is also noise associated with hunting, such as the discharge of firearms or dogs barking when pursuing game.

*Comments for the Division of Fish and Wildlife are provided by Edna Stetzar - (302) 653-2880, [Edna.Stetzar@state.de.us](mailto: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.

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. The Sediment and Stormwater

Management Program ensures sediment and erosion control plans and stormwater plans comply with local land use ordinances and policies, including the siting of stormwater management facilities. However, we do not support placement in resource protection areas or removal of trees for the sole purpose of placement of a stormwater management facility/practice.

### **Drainage Program**

- The Drainage Program recommends the creation of a maintenance plan for the waterways within this subdivision. The Drainage Program recommends that a maintenance area of dedicated open space be set aside for mechanized maintenance, and possible spoil placement, if the waterway requires periodic maintenance or future re-construction. Identify maintenance access points and spoil disposal areas on the sediment and stormwater plans.
- 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.
- Preserve existing riparian buffers on this site to aid in the reduction of nutrients, sediment, and other pollutants entering Pepper Branch. This site will drain into Records Pond, which has existing water quality problems. Please explore methods to filter excess nutrients in stormwater runoff from this site before releasing stormwater into the Records Pond watershed.

*James Sullivan - (302) 739-9921, [James.Sullivan@state.de.us](mailto:James.Sullivan@state.de.us)*

**Flood Management.** This proposed subdivision currently is not located within a Special Flood Hazard Area. However, Pepper Branch has never had a detailed flood study done to establish Base Flood Elevations. This project is proposing to remove 56 acres of forest, which could have some impact on the floodplain for Pepper Branch as this proposed subdivision is located at the very top of the watershed. We would suggest measures be taken to mitigate any negative impact to downstream properties. *Gregory Williams - (302) 739-9921, [Gregory.Williams@state.de.us](mailto:Gregory.Williams@state.de.us)*

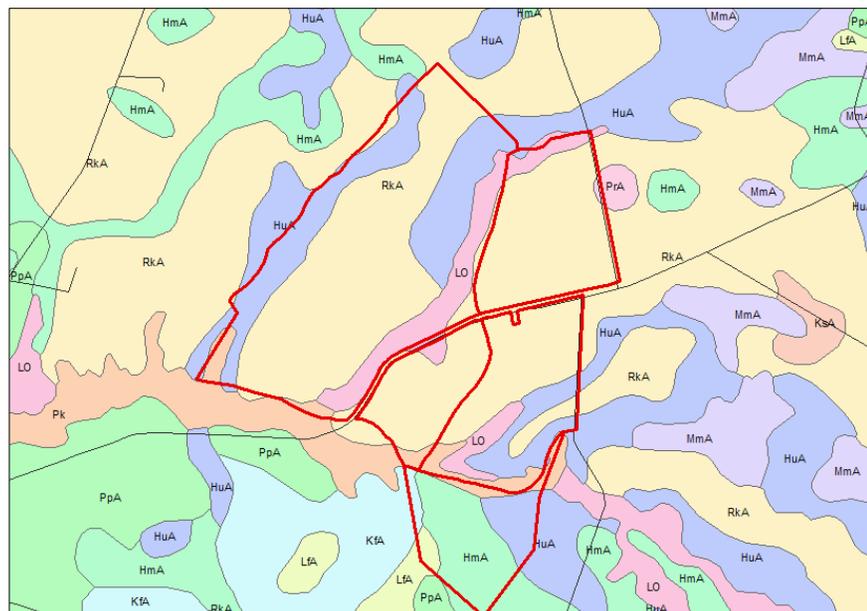
### **Water Resources**

**Soils Assessment.** According to the NRCS soil survey update, Hambrook (HmA), Rockawalkin (RkA), Hurlock (HuA), Longmarsh (LO), and Puckum (Pk) were mapped in the immediate

vicinity of the proposed construction (See figure 1). Hambrook and Rockawalkin are moderately well drained upland soils that have moderate limitations for development. Hurlock is a poorly drained wetland associated (hydric) soil that has severe limitations for development. Longmarsh and Puckum are very poorly drained wetland associated (hydric) floodplain soils that have severe limitations for development and should be avoided. Approximately 20% of the mapped soils are Longmarsh, Puckum, and Hurlock.

A significant portion of this parcel contains poorly drained wetland associated (hydric) soils which have a seasonal high water table occurring at or near the soil surface (within one foot of soil surface or less). Building in such soils is likely to leave prospective residents of this and adjoining properties susceptible to future flooding problems from groundwater-driven surface water ponding, especially during extended periods of high-intensity rainfall events such as tropical

storms/hurricanes or “nor’easters.” This is in addition to increased flooding probabilities from surface water runoff emanating from future created or constructed forms of structural imperviousness (e.g., rooftops, roads, sidewalks, and stormwater management structures).



**Figure 1: NRCS soil survey update mapping in the immediate vicinity of Phillips Hill Farm.**

Based on the Chapter 99, Section 16A of the Sussex County Code (paraphrased), lands compromised by

improper drainage or flooding potential pose significant threats to the safety and general welfare of future residents and, therefore, shall not be developed. Soils mapped as Hurlock, Puckum, and Longmarsh fit the criterion for improper drainage or high flooding potential, and should be avoided. The Watershed Assessment Section believes permitting development on such soils would be inconsistent with above-mentioned regulatory guidelines in the Sussex County Code.

**Wetlands.** Based on Statewide Wetlands Mapping Project (SWMP) mapping, palustrine forested scrub-shrub riparian wetlands (PFO1/SS3C7) and palustrine forested wetlands (PFO1E7) bisect or bound the central and southern portions of the proposed project area (See figure 2). Outside of the two road crossings of Pepper Branch, it looks like the project is not in

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subaqueous lands. There is a small blue line tributary shown on the 7.5 Minute USGS Quadrangle map on the south part of the project (north of a larger tributary) that may be impacted by the development. The concept plan does not show the tributary and because it is a jurisdictional stream under State regulations, it should be checked.

Additionally, the developer should anticipate applying for a subaqueous lands permit from the Wetlands and Subaqueous Lands office and having to mitigate for the stream crossings, unless they do clear span crossings. Examples of mitigation include obtaining conservation easements for the wetlands and stream corridors on the property and/or doing some kind of stream/wetland restoration approvable by this office. There are also non-tidal wetlands on the property that need to be checked by the Army Corps of Engineers.

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.

For waterfront communities, applicants should depict any proposed plans to provide water access for residents of the community. Centralized community structures such as small residential marinas, boat ramps or community fishing piers are preferred over individual docks and piers at individual waterfront lots. Should individual docks be preferred, application must be made by each waterfront property owner after the sale of the lot, and permit decisions will be made by the Department on a case by case basis. However, in making representations to prospective buyers, please be advised that the Department is required to consider cumulative impacts and avoidance measures when reviewing applications, so there is no guarantee that all, or even any, of the waterfront property owners will be granted such permits. Permits for speculative construction will not be issued to developers to construct individual waterfront docks and piers prior to the sale of the lot(s) in question. Permits may be granted to developers who propose centralized community structures prior to the sale of any lots.



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) 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 Best Management Practices.** The applicant estimates this project's post-construction surface imperviousness to reach only 19 percent. However, given the scope and density of this project (i.e., as viewed from the conceptual project layout) this estimate appears to be a significant underestimate. According to the TR-55 methodology for determining impervious cover, given the average lot size of 7,669 square feet (.17 acres), impervious cover is more likely to be between 38 and 65 percent. When calculating surface imperviousness, it is important to include all forms of constructed surface imperviousness, such as all paved surfaces including rooftops, sidewalks, driveways, and roads; open-water stormwater management structures and/or ponds; and community wastewater systems. This will ensure a realistic assessment of this project's likely post-construction environmental impacts. Surface imperviousness should be recalculated to include all of the above-mentioned forms of surface imperviousness in the finalized calculation for surface imperviousness. Failure to do so will significantly understate this project's true environmental impacts. Therefore, the calculation for surface imperviousness should be corrected and/or recalculated to reflect all the above-mentioned concerns.

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 this project's 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 Broad Creek 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 Broad Creek watershed, "target-rate-nutrient reductions" of 30 and 50 percent will be required for nitrogen and phosphorus, respectively. Additionally, "target-rate-reductions" of 2 percent will be required for bacteria.

As indicated above, TMDLs for nitrogen and phosphorus have been proposed for the Broad Creek watershed. The TMDL 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. A Pollution Control Strategy (PCS) will be used as a regulatory framework to ensure that these

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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 wider vegetated buffers along watercourses/wetlands, increasing the amount of passive, wooded open space, use of pervious paving materials to reduce surface imperviousness, and deployment of green-technology stormwater management treatment technologies. Contact Lyle Jones at 302-739-9939 for more information on the assessment tool.

*Soils, wetlands, impervious cover and TMDL comments provided by John Martin, Watershed Assessment Section, (302) 739-9939, [John.Martin@state.de.us](mailto:John.Martin@state.de.us)*

**Water Allocation.** The project information sheets state that public water will be provided to the project by a new on-site well. Our records indicate that the project site is not located in an area where public water service is available. Any public water utility providing water to the site must obtain a Certificate of Public Convenience and Necessity (CPCN) from the Public Service Commission. Information on CPCNs and the application process can be obtained by contacting the Public Service Commission at 302-736-7547. Information regarding the project site does not include a location of the proposed new well, therefore, should an on-site public/miscellaneous public well be needed, 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, furthermore, the well must be located at least 150 feet from the outermost boundaries of the project(s). The Division of Water Resources will consider applications for the construction of on-site wells provided the wells can be located and constructed 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](mailto:Ricardo.Rios@state.de.us)*

**Water Supply.** The DNREC Ground Water Protection Branch (GPB) has determined that the project falls partially within an excellent ground-water recharge potential area for Sussex County (see map). No wellhead protection areas were found. This project was previously reviewed as Ross Point Farm PLUS 2006-08-10, Phillips Farm PLUS 2007-06-04, and Phillips Farm 2008-09-14. The developer has not responded to any of these previous comments.

1. PLUS 2007-06-04 showed a “Waste Disposal Area” in the excellent ground-water potential area. PLUS 2008-09-14 indicated that an onsite wastewater treatment system would be on site.

The Ground Water Protection Branch asks:

- Where is the Waste Disposal Area located?
  - Is there a system design?
  - Has a Letter of Intent been sent to DNREC?
2. Excellent ground-water recharge potential 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 is an “indicator of how fast contaminants will move and how much water may become contaminated” (Andres, 2004, pg 1). Land use activities or impervious cover on areas of excellent groundwater recharge potential may adversely affect the quality and quantity of ground water in these areas.

**Sussex County Ordinance No. 1979 §89-7.** A. (1) does not impose additional limitation upon land development, provided the impervious cover within the excellent recharge area is 35% or less.

**Sussex County Ordinance No. 1979 §89-7.** A. (2) allows impervious cover greater than 35% but no more than 60% of the within the portion of the tax parcel provided the applicant provides an environmental assessment report to insure that post-development recharge quantity meet or exceed the pre-development recharge quality.

The developer on the PLUS application states that the proposed development would change the impervious over from 0% to approximately 19.08%. This percentage quantifies the impervious cover of the entire parcel and not the percentage within the excellent ground-water recharge potential area. Based on an ArcMap application calculation, the percentage of impervious cover within the excellent ground-water recharge potential area dedicated to roadways is approximately 19%.



**The excellent ground-water recharge potential area is shown in green.**

An ArcMap application calculation determined that the area of the development within the excellent ground-water recharge potential area is approximately 23 acres. There is approximately 4 acres dedicated to streets. Based on this calculation, the percentage of impervious cover dedicated to streets is 19% within the excellent recharge area. If the streets alone were 19%, it would appear that the impervious cover within the recharge area exceeds the amount reported on the application.

This amount of impervious cover (between 38% and 65%) requires an Environmental Assessment including a climate budget to document post-development recharge is greater than or equal to pre-development (Sussex County Ordinance No. 1979, § 89-7 (2))

*GPB recommends:*

- Environmental Assessment including a climate budget to document that post-development recharge is greater than or equal to pre-development (Sussex County Ordinance No. 1979, § 89-7 (2))
  - Move open space into this area to reduce the amount of impervious cover to below 35%.
3. The PLUS application indicates that a new well will be drilled on site but the location is not shown on the site plan.

GPB states the well must comply with the Delaware *Regulations Governing the Construction and Use of Wells* to include, but not limited to:

#### SECTION 4 - WELL CONSTRUCTION STANDARDS

4.01 Siting Criteria, J. All public water wells within a housing development, subdivision, or strip development recorded on or after the implementation date of these Regulations shall be located at least one hundred fifty (150) feet within the subdivision or development's outermost property lines.

In addition, because the excellent ground-water recharge potential areas can so quickly 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](mailto:Anne.Mundel@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:

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- 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 Phillips Hill Farm development may have.

Emissions Attributable to Phillips Hill Farm Subdivision (Tons per Year)

	Volatile Organic Compounds (VOC)	Nitrogen Oxides (NOx)	Sulfur Dioxide (SO <sub>2</sub> )	Fine Particulate Matter (PM <sub>2.5</sub> )	Carbon Dioxide (CO <sub>2</sub> )
Direct Residential	12.1	1.3	1.1	1.4	48.9
Electrical Power Generation	ND*	4.8	16.6	ND*	2,454.7
Mobile	17.9	18.7	0.5	0.2	11,526.5
<b>Total</b>	<b>30.0</b>	<b>24.8</b>	<b>18.2</b>	<b>1.6</b>	<b>14,030.1</b>

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

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 Philips Hill Farm 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](mailto:Deanna.Morozowich@state.de.us)

**Hazardous Waste Sites.** No Site Investigation and Restoration Branch (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.