

2018-015-125

ENVIRONMENTAL IMPACT STATEMENT TENNENT ROAD WASH & LUBE, LLC

**BLOCK 122, LOT 33
TOWNSHIP OF MARLBORO
MONMOUTH COUNTY, NEW JERSEY**

AMENDED PRELIMINARY & FINAL SITE PLAN APPLICATION

February 16, 2021


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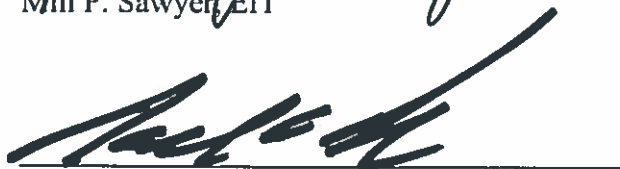

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1. INTRODUCTION

In accordance with the Township of Marlboro Land Use and Development Ordinance (§ 220-159), this report addresses the environmental impacts associated with the proposed development. The subject property is located at Block 122, Lot 33 and has frontage along Tennent Road (County Road 3).

The report is organized to discuss environmental issues as follows:

1. An inventory of existing environmental conditions;
2. An assessment of the environmental impact of the proposed development;
3. The irreversible damage to natural resources as a result of the development; and
4. Adverse impacts and the mitigation measures proposed to offset negative impacts.

2. PROJECT DESCRIPTION

A. Existing Conditions

The project site is identified as Block 122, Lot 33 of the official Tax Map of Township of Marlboro, Monmouth County, New Jersey and contains a total of 0.87 acres, located in the C-2 Neighborhood Commercial District. The development tract is adjacent to existing commercial development, with driveway access to Tennent Road.

The existing site is currently vacant, however, it was previously developed and contained a single-family dwelling. The residential structure was re-purposed for commercial use, as illustrated in a resolution of site plan approval adopted by the Township Planning Board in 2007 included herewith as **Appendix A**. The site contains open field and wooded areas primarily along the perimeter where buffer plantings were placed as part of previous development adjacent to a shopping center.

B. Proposed Design

The intended development for which approval is sought includes a one-story car wash and vehicle lube center on a previously developed 0.87 acre parcel, where a single family dwelling formerly existed. The physical improvements being proposed include a one (1) story car wash tunnel & four (4) bay vehicle lube center, essential underground utilities, landscaping and buffering improvements, a bituminous pavement parking area, and a stormwater management system.

The development will utilize public water service and sanitary sewerage collection facilities which presently exist at the site. Gas service will be provided by New Jersey Natural Gas Co. Electric service will be provided by Jersey Central Power and Light Company, as also presently exist at the site location.

3. INVENTORY OF EXISTING ENVIRONMENTAL CONDITIONS

A. Topography

The topography of the site is gently to moderately sloping at gradients typically in the 0-10 percent range. The existing configuration of the site includes a ridge line through the parcel in a north-south direction. The present topography of the site results in runoff patterns consisting of overland flows tributary to off-site storm sewers and subsequent piped stormwater flow to an existing stormwater outfall situated on adjacent Lot 31 in Block 126.

Freshwater wetlands are known to exist north and west of the site, which receive runoff from this site as well as surrounding development. No freshwater wetlands exist on site as verified by NJDEP.

Runoff from this site and surrounding development drain to swamplands which are tributary to a watercourse known as Birch Swamp Brook, the headwaters of which are situated roughly 1,900 feet northwest of the subject premises.

B. Geology

Monmouth County is a part of the Atlantic Coastal Plain Physiographic Province, which is underlain by unconsolidated sediments of Tertiary and Cretaceous age. The Geologic Maps of New Jersey sourced from the NJDEP are included herewith in **Appendix B**. This coastal plain once existed as a shallow shelf and received sediments from the eroding Appalachian Mountains. The continental plain formed a thick wedge that periodically subsided under the weight of the sediments in the eroding particles of silt, sand and clay, which were washed onto the shelf.

The coastal plain sediments are of marine and continental origin and are composed mainly of sand, silt, clays and green sands, or glauconitic sands, with interspaced gravel beds. Sandstones and shales formed from compaction and cementation are locally scattered throughout the formations. A thin veneer of sand, clay and gravel deposits of more recent age overlie the coastal plain sediments. This layer is of Quaternary age, or less than 1 million years old, and was deposited by outwash from the glacial age. The last glacier that covered the land formed a terminal moraine (i.e., a ridge of transported material found at the end of a glacier) in northern New Jersey.

According to U.S. Geological Survey and County maps, the site location lies on the Englishtown Formation of the Cretaceous age. This Cretaceous formation is the parent material for the Keyport soils found on the site.

The Englishtown Formation, in Monmouth County, is approximately 140 feet thick. It consists of quartz sand which is coarse to fine-grained and locally embedded with thin to thick beds of clay. The clay is black to gray. Locally sand is cemented with an iron oxide

cement. Although rare in Monmouth County, marine fossils are found in the Englishtown Formation.

Like the Raritan and Magothy Formations below it, the Englishtown Formation is important in Monmouth County. Both private homeowners and municipal water supplies in the county utilize the Englishtown Formation for water wells.

The Englishtown Formation rests conformably on the Woodbury Clay and is in turn conformably overlain by the Marshalltown Formation. It occupies an outcrop area of approximately 45 square miles in Monmouth and Middlesex Counties.

According to the U.S.D.A. Soil Conservation Service, Monmouth County Soil Survey, the depth to bedrock of all soil series mapped on the subject property is greater than 60 inches.

C. Geohydrology

The saturated, or groundwater zone can fall into three categories: an aquifer (a saturated formation that yields a significant quantity of water); an aquiclude (a saturated formation through which there is limited movement of water and small yield); and an aquitard (a saturated formation through which vertical leakage of water is possible, but which yields minor quantities of water).

The Englishtown Formation yields sufficient water to be considered an important aquifer. It is estimated that the water-yield potential for the Englishtown Formation is in excess of 4,000,000 gallons per day.

The Englishtown Formation is an aquifer which is considered to have a good aquifer yield. Most of the geologic formations above bedrock in Monmouth County are permeable to some degree, thereby providing varying amounts of recharge to aquifers. Recharge from this site is limited to infiltration through on-site soils. As no on-site water well is planned as part of the proposed improvements it is not anticipated that the proposed site improvements will have any impact on the local aquifers.

TABLE 1

THICKNESS, PUMPAGE AND WATER-BEARING CHARACTERISTICS OF MAJOR AQUIFERS IN MONMOUTH COUNTY

AQUIFER	THICKNESS (feet)	WATER-BEARING CHARACTERISTICS
^a Englishtown Formation	30-50	Yields range from 25-640 gpm.
^c Woodbury Clay Merchantville Formation	50	Not considered an aquifer.
^p Raritan and Magothy Formation	25-50	Yields range from 100 to 1400 gpm for large diameter wells.

Source: Special Report No. 2, Geology and Groundwater Resources of Monmouth County, New Jersey, prepared by U.S. Geological Survey in cooperation with the State of New Jersey Department of Conservation and Economic Development -1968

Water Service to the site will be provided by present infrastructure, with no expansion of which anticipated or proposed. The above information is provided to illustrate the nature of subsurface conditions at the site. The proposed development is expected to have negligible adverse environmental impact on existing aquifers, particularly considering the re-use of rooftop runoff in the car washing process, and recycling and re-use of washwaters.

D. Water Quality

Water quality is affected by soil permeability, chemical and mineralogical properties, such as iron and aluminum content, organic matter, acidity and clay content. Physical properties, such as soil moisture, texture and structure can all influence a site's vulnerability to contamination from development-related sources, such as contaminants washed from pavement surfaces into stormwater runoff, and effluent from improperly maintained septic systems.

Groundwater samples, taken from the Englishtown aquifer by the NJDEP, concluded that there were no major water quality problems and that the groundwater generally meets New Jersey criteria for potable water.

Water quality in the area of the site is greatly dependent upon the influence of fallow and wooded lands, as well as surrounding land use. The surrounding undeveloped tracts assist in the maintenance of water quality due to natural infiltration and filtration processes and the low incidence of contaminants. Some negative impact on area water

quality can occur through the use of poorly designed, constructed or maintained septic systems, and pavement surfaces.

Untreated runoff from pavement surfaces can contribute organic and metallic pollutants, plus salts. A comprehensive stormwater management system is part of the design of this development project, consisting of manufactured water quality treatment devices and a detention basin has been proposed to handle runoff from the site.

E. Air Quality

The New Jersey Department of Environmental Protection (NJDEP) has established a list of standards for concentrations of various substances present in the air. The air quality monitoring station located nearest to the site is in Ryder University. This monitoring station evaluates the ozone levels and nitrogen dioxide levels. The nearest sulfur dioxide monitoring station is located in Perth Amboy. The nearest inhalable and fine particulate monitoring station is located in New Brunswick and the nearest carbon monoxide monitoring station is located in Freehold. The closest lead monitoring station was located in New Brunswick. The following information was taken from the 2006 Air Quality Report which is the most recent complete air quality report available.

The NJDEP has established a standard of 0.14 ppm which cannot be exceeded more than once in any 12-month period for sulfur dioxide. This standard has not been exceeded for the regional area by the recorded reading of 0.031 ppm.

There is no ambient air quality standard for smoke shade. The daily average coefficient of haze (CoH) found in Freehold was found to be 0.59.

The national standard for inhalable particulates (PM_{2.5}) annual arithmetic mean concentration of 15 micrograms per cubic meter has not been exceeded by the recorded annual mean of 9.8 ug/m³.

The national standard for inhalable particulates (PM₁₀) annual arithmetic mean concentration of 50 micrograms per cubic meter has not been exceeded by the recorded annual mean of 22.0 ug/m³.

The carbon monoxide 1 hour average primary standard of 35 ppm has not been exceeded by the recorded data of 3.3 ppm, nor has the 8 hour average of 9 ppm, by the recorded data of 1.5 ppm, both recorded at the Freehold Monitoring Station.

The nitrogen dioxide concentration 12 month geometric primary and secondary standard of 0.05 ppm for the 1-hour average guideline has not been exceeded by the recorded average of 0.017 ppm.

The ozone standard of 0.12 ppm for the daily maximum 1-hour average has not been exceeded with a high reading of 0.116 at the Monmouth University Station.

The lead standard of 1.5 micrograms per meter cubed for the 3-month arithmetic mean was not exceeded.

The two (2) aspects of potential air quality impacts for this specific site are construction and operation. During construction, pollutants would be emitted by construction vehicles (carbon monoxide, hydrocarbons, nitrogen dioxide, and particulates), along with fugitive dust from the disturbed area. Fugitive dust generation will be controlled through the implementation of temporary seeding procedures on exposed soils during construction in accordance with the approved Soil Erosion and Sediment Control Plan. With respect to fuel emissions from construction vehicles, air quality impacts will be temporary, and because of good existing air quality in the area, are not expected to cause any violation of the NJ Ambient Air Quality Standards.

Once completed, the principal air pollutants generated by the project would be carbon monoxide and hydrocarbons from the vehicular traffic generated by the car wash development. This increase is not expected to cause a violation of the NJ Ambient Air Quality Standards.

Upon completion of the project, the types of energy that will serve the development will be electricity and gas. As it is proposed, the project will not impact the ambient air quality. The resulting emissions from vehicular activity will be the only potential pollutant. However, the scope of the project is not large enough to generate significant emissions levels.

The proposed carwash and lube center will generate a very modest volume of new traffic to the area, with a significant number of pass-by trip volume anticipate. Refer to a Traffic Impact report prepared by Dolan and Dean Associates, dated November 18, 2019 for detailed study. Because of the small amount of expected traffic volumes, no notable impact on area air quality is likely to occur.

There was no air quality violation listed for the above air quality monitoring centers in regional proximity to the site other than ozone which is at non-attainment statewide. Therefore, a conclusion can be drawn that overall air quality is good and no measurable impacts are anticipated from build out of the project.

F. Soils

The USDA NRCS Web Soil Survey (**Appendix B**) lists the following soils as present at the subject property:

1. KemB – Keyport sandy loam, 2 to 5 percent slopes
2. KkgkB – Klej loamy sand, clayey substratum, 0 to 5 percent slopes

The Keyport soils are described as moderately well drained soils, formed in acid, clayey coastal plain sediments, with depths to groundwater noted to range from 1.5 feet to 4 feet.

Klej soils are described as moderately well drained soils with depths to groundwater described to range from 1.5 feet to 2 feet, however actual soils investigations conducted on site indicate a significantly greater depth to groundwater. The klej soils are noted to be limited on-site along the property frontage at Tennent Road.

Site soils were further investigated by advancing soil borings and the placement of monitoring wells to record fluctuating ground water levels. The soils were sampled and subjected to tube permeameter testing to identify actual permeability rates. Actual permeability rates were recorded ranging from 6.1 inches per hour (K-4) to 24.3 inches per hour (K-5).

Detailed soil logs and permeameter test results are also included in Appendix 'C' of this report.

G. Acid Soils

The soils on-site are anticipated to have relatively low pH values, but the impact from the disturbance of acid soil is expected to be minimal. A brief discussion of the potential impacts follows.

Acid-producing soil deposits consist of iron sulfide minerals (pyrite or marcasite), which oxidize and produce sulfuric acid upon exposure to air or water. This sulfuric acid can have adverse environmental impacts because it can increase the solubility of metals to the extent that they can become toxic to aquatic life or land vegetation. The acidification impacts of a development proposal are largely determined by the acid-producing potential of the deposits and the physical extent and the duration of their exposure.

H. Surface Water

There is no surface water feature associated with the proposed development property in question. A review of the property utilizing NJDEP's GeoWeb database confirmed the findings. A small portion of the property in the northwest corner along the property's edge contains deciduous wooded wetlands.

I. Drainage Patterns

The stormwater management system designed as part of this project maintains present runoff patterns as related to adjacent properties and provides on-site detention and water quality treatment. The stormwater runoff leaving the site in the post-development condition shall meet the stringent requirements of NJDEP related to major development as related to post-development peak rate reductions and water quality enhancements.

J. Subsurface Water

Subsurface water at the site is contained in the water table found in the soils on the site and in the Coastal Plain geologic formations underlying the site (see Section entitled "Geohydrology"). No adverse impacts from development are anticipated or reasonably expected to occur.

K. Vegetation

Onsite vegetation includes the following tree species: Black Oak, Black Pine, Holly, Locust, Norway Spruce, Pitch Pine, Red Maple, Sassafras, Sweetgum, Sycamore, White Pine, and Yellow Birch. All existing trees are to be removed unless otherwise noted in the civil plan set. Prior to site disturbance, a tree removal permit must be obtained in accordance with Section §337-15 of the Marlboro Township code.

The following vegetation species are proposed for the site:

<u>Scientific Name</u>	<u>Common Name</u>
Shade Trees	
Fraxinus Pennsylvania 'Patmore'	Patmore Green Ash
Ornamental Trees	
Cercis Canadensis	Eastern Redbud
Evergreen Trees	
Picea Pungens Glauca	Colorado Blue Spruce
Chamaecyparis x Cupressocyparis Leylandii	Leyland Cypress
Thuja Occidentalis 'Smaragd'	Emerald Green Arborvitae
Shrubs	
Azalea x 'Hino Crimson'	Hino Crimson Azalea
Juniperus Sabina Arcadia	Arcadia Juniper
Buxus Microphylla Japonica 'Winter Gem'	Winter Gem Boxwood
Ilex Mesenae 'China Girl'	China Girl Holly
Photinia x Fraseri	Fraser's Photinia
Rosa x 'Radrazz'	Knock-Out Shrub Rose
Juniperus Chinensis 'Armstrong'	Armstrong Juniper
Prunus Laurocerasus 'Schipkaensis'	Schipka Cherry Laurel
Rhododendrom x 'Scintillation'	Scintillation Rhododendron
Viburnum Nudum 'Bulk'	Brandywine Viburnum

L. Wildlife

In order for a particular site to provide wildlife habitat, specific habitat requirements essential for survival must be present. These include food, cover and a water source. Various species have differing biological needs, as would be expected from the diversity of wildlife types.

Man's alteration of the environment is evident in the existing on-site improvement but has not limited the site in its ability to provide an ecosystem capable of supporting a diversity of the components necessary to sustain a wildlife population. Each soil has a suitability classification for various types of plants that can provide wildlife habitat. There are six elements of plant life that can provide habitat and are affected by soil conditions:

1. Grains and seed crops: This group includes crops grown for grain or seed, such as corn, wheat, barley, buckwheat, sunflowers and other crops grown for seed and grain. Some of these species are present on the site.
2. Grasses and legumes: These include domestic perennial grasses and herbaceous legumes established by planting, such as bluegrass, fescue, orchard grass, reed canary grass, clover and alfalfa. Some of these species are present on the site.
3. Wild herbaceous plants: These are native or introduced perennial grasses and weeds that grow naturally. Included are barnyard grass, wild rye, panic grass, goldenrod, wild carrot (Queen Anne's Lace), nightshade and dandelion. Some of these plants are found on the site.
4. Hardwood woody plants: These include nonconiferous trees, shrubs and woody vines producing nuts or other fruits, buds, catkins, twigs or foliage that wildlife eat.

Among the native plants that grow naturally or can be planted are oak, cherry, maples, yellow poplar, beech, apple, dogwood, sumac, sassafras, hazelnut, black walnut, hickory, sweet gum, bayberry, huckleberry, viburnum, grape and briers. Also included in this group are commercially raised fruiting shrubs that can be planted, such as Autumn-olive, Amur honeysuckle, Tatarian honeysuckle, crabapple and silky cornel dogwood. A number of these types of plants are present.

5. Coniferous woody plants: These include cone-bearing evergreen trees and shrubs that provide cover, browse and seed cones, such as Norway spruce, shortleaf pine, Scotch pine, red cedar and juniper. These grow naturally or may be planted. Some of these species exist on the site.
6. Wetlands plants: These are wild, herbaceous annual and perennial plants that grow in moist to wet environments, such as smartweed, wild millet, bullrush and other sedges, arrowarum, pickerlweed, waterwillow, wetlands grasses and cattails. There are almost none of these and other species on the site.

The predominant wildlife that may traverse the property are birds, squirrels, mice and other small mammals. There may be larger mammals on the site from time to time, such as white-tailed deer, raccoon, opossum, groundhog and rabbit. Each of these species has a specific habitat range, starting under an acre in size for the smaller mammals, up to 640 acres for the white-tailed deer.

Trees reaching a mature height will attract nesting species such as the bluejay, common crow and mourning dove. Fruit and nut-bearing trees attract birds and squirrels that use the fruits and nuts for a food source. Birds of prey, such as the red-tailed hawk, will hunt the mammals, such as squirrel. There has been a research and site investigation concerning the issue of potential threatened or endangered species on the subject site. All site investigations have revealed that there is no evidence that threatened or endangered species existing within the subject tract.

Endangered species are defined as those whose prospects for survival in New Jersey are in immediate danger; threatened species are those that may become endangered if conditions surrounding the species continue to deteriorate. The NJDEP Division of Fish, Game and Wildlife is responsible for the protection of endangered and threatened species in New Jersey. An inquiry was made to the NJDEP for records were sightings of any threatened or endangered species on were in the immediate vicinity of the site. The US Fish and Wildlife Service's IPaC resource list was also consulted. A copy of these findings is provided in Appendix B. Only the Northern Long-eared Bat is listed as potentially affected by activities in this location, however no critical habitat has been designated for this species.

During routine site visits no evidence was found that would indicate the presence of any threatened or endangered species. As would be expected most of the wildlife sightings were in and around the wooded area located directly along the stream corridor. Proximity to watercourse provides a more enhanced wildlife habitat within the stream corridor. Habitat on site and in the general vicinity is limited due to the developed nature of the vicinity.

The following is a list of wildlife species known to exist in Monmouth County:

**TABLE 3
WILDLIFE FOUND IN MONMOUTH COUNTY**

Mammals

Opossum	Gray Fox
Smokey Shrew	Woodchuck
Least Shrew	Eastern Chipmunk
Short-tail Shrew	Eastern Gray Squirrel
Star-nose Mole	Red Squirrel
Eastern Mole	Southern Flying Squirrel
Keen's Myotis (bat)	Beaver

Little Brown Myotis
Small-footed Myotis
Silver-haired Bat
Eastern Pipistrel
Red Bat
Big Brown Bat
Hoary Bat
Raccoon
Longtail Weasel
Mink
River Otter
Striped Skunk
Red Fox

White-footed Mouse
House Mouse
Norway Rat
Southern Bog Lemming
Boreal Redback Vole
Meadow Vole
Pine Vole
Muskrat
Meadow Jumping Mouse
Eastern Cottontail Rabbit
New England Cottontail
Virginia Whitetailed Deer
European Hare

Reptiles

Lizards

Northern Fence

5-Lined Skink

Turtles

Common Snapping
Wood Turtle
Musk Turtle
Diamond-Backed Terrapin
Eastern Box

Bog Turtle
Spotted Turtle
Eastern Mud
Eastern Painted
Red-Earred

Snakes

Eastern Smooth Earth
Northern Brown
Eastern Garter
Eastern Hognose
Northern Ringneck
Northern Black Racer
Black Rat
Scarlet
Eastern King

Red-Bellied
Northern Water
Eastern Ribbon
Eastern Worm
Rough Green
Northern Pine
Corn
Eastern Milk
Timber Rattler

Amphibians

Toads

Eastern Spadefoot

Fowlers

Tree Frogs

Spring Peeper	Gray
New Jersey Chorus	

True Frogs

Cricket	Carpenter
Pickerel	Green
Northern Leopard	Wood
Bull	

(Source: Monmouth County Parks System)

Some of these species may utilize wooded areas at the site, as they are known to exist in Monmouth County. Actual sightings are not recorded due to nocturnal feeding habits, underground burrows and other wildlife behavior not compatible with human observation during a site visit for purposes of this report.

Development of the proposed design will further impact wildlife habitat by construction of the commercial development. The majority of the site consists of already disturbed land. The project will require the removal of a significant portion of the existing wooded area on site. However, the types of wildlife species present are known to be adaptive. They will migrate within their range to less developed surrounding areas.

M. Land Use

Land uses surrounding the subject property in Township of Marlboro are similarly situated in the C-2 Commercial Zone and include the following:

1. Long standing bank is adjoining to east on lot 32
2. Insurance/finance office & art school to west on lot 34
3. Morganville square shopping center to north on lot 31
4. Existing residences to south across Tennent Road in block 123
5. Exxon gas station just east of site on opposite side of Tennent Rd.
6. Several automotive related uses along Tennent Road west of the site

N. Solid Waste Management

Solid waste management planning is implemented under the supervision of the Township. All collection and disposal of solid waste is governed by the provisions of the County's Solid Waste Management Plan, under the authority of the municipality, in conformance with the New Jersey Solid Waste Management Act. Solid waste removal from the site will be provided as follows:

Solid waste is to be removed by a hired private contractor. Used oil collection from the intended vehicle lubrication use shall be performed by private hauler, duly licensed to perform such work.

4. ASSESSMENT OF ENVIRONMENTAL IMPACT OF PROJECT

A. Impact on Vegetation and Wildlife Habitat

There will be some impact on vegetation and wildlife habitat due to the proposed development. Populations of birds and mammals will be less disrupted by construction at the site due to the previous clearings of land onsite and in the surrounding area. Species tend to return to the area once new vegetation is established and construction activities have ceased. These species are also capable of co-existing in a man-made environment. Portions of the surrounding area are wooded and can provide nesting and habitat.

B. Impact on Hydrologic Conditions

The stormwater management system designed as part of this project is in strict conformance with local and NJDEP requirements for major development. Please refer to a report entitled "Stormwater Management Report" prepared for this project for detailed analyses to support a conclusion that no adverse environmental impact will result from the intended development.

All development affecting groundwater will be carried out in conformance with State laws and NJDEP regulations. Therefore, no degradation of surface water quality is expected to occur as a result of development. One water quality/detention/infiltration basin is proposed. This will allow contaminants, such as petroleum products from automobiles and vehicle tire wear, and nutrients, pesticides and herbicides from landscape management, to settle out and infiltrate runoff before it enters the surface water body. All construction will be in accordance with State permits and an approved Soil Erosion and Sediment Control Plan specifically designed to eliminate soil erosion and prevent sediments from entering the existing storm sewer systems or waterways.

C. Impact on Soil Erosion and Sedimentation

All grading activities will conform to a Soil Erosion and Sediment Control Plan approved by the Freehold Soil Conservation District, the agency in charge of soil disturbance for Township of Marlboro. The developer will use approved soil erosion and sediment control measures such as silt fences, a stabilized construction entrance, inlet filters, tree protection, topsoil stockpile, vegetative stabilization and conduit outlet protection devices. Before and after construction, erosion will be minimized by installation of temporary and permanent landscaping on exposed soils.

D. Impact on Water Quality

Water quality of the Birch Swamp Brook or surrounding waters of the state will not be adversely affected by drainage from the site. Runoff leaving the site will be pre-treated by a detention basin and subsequent manufactured treatment devices to allow potential pollutants to settle out of the flows that reach the ultimate discharge point. The effects of any remaining small amounts of waste are mitigated by dilution, biodegradation, infiltration, aeration, aging and uptake by organisms.

The peak runoff flows at the discharge point will be controlled to maintain the natural pattern of flow. All storms up to and including the 100-year storm, will be properly attenuated in accordance with applicable standards. Pre-development peak flows for the 2, 10, and 100-year storms have been reduced in the post-development conditions. Because the design adheres to the State Water Quality Standard for stormwater runoff, adverse impacts to water quality are not anticipated from site runoff.

E. Impact on Air Quality

Upon completion of the project, resulting emissions from onsite vehicular traffic will be the only potential air pollutant. It is our conclusion that this impact on air quality will be minimal recognizing the scope of development intended. The use is not expected to generate a significant increase in local vehicular traffic. The impact on air quality was analyzed using NJDEP published ambient air quality standards and data based on regional receptors.

During the project's construction stages, local air quality may be temporarily affected by emissions from construction equipment, automobiles used by workmen, and delivery vehicles to the site. The effect will be minimal though, as emissions will not be excessive and dispersion of carbon monoxide in the atmosphere is rapid.

Monmouth County as a whole and the Township of Marlboro area, meets State and Federal primary and secondary ambient air quality standards. Lead has become less of a problem through decreased use of leaded gasoline. Therefore, it is our opinion that the construction of the proposed improvements will not result in a violation of the state air quality standards.

F. Impact on Noise Levels

The site is bordered by Tennent Road in close proximity to State Highway Route 79. Most of the noise generated in the vicinity of the site is generated by vehicular traffic on Tennent Road and State Highway 79.

Construction of the commercial development will introduce noise sources in the form of construction related activities.

Once construction is complete, this use is expected to have a negligible effect on noise levels, due to the fact that the proposed enclosed car wash tunnel is not expected to generate a substantial quantity of noise, nor result in a significant increase in vehicular traffic on either Tennent Road or Highway 79.

Therefore, it is our opinion that the construction of the proposed improvements will not result in a significant increase in ambient noise levels at that location.

G. Impact on Potable Water Supply

There will be a negligible impact on potable water as a result of the proposed project, as no on-site water wells are proposed.

The site stormwater management design incorporates the re-use of rooftop runoff to minimize domestic water usage. Additionally, the car wash mechanical components are designed to recycle and reuse washwaters to further minimize domestic water usage.

H. Impact on Sanitary Sewerage Disposal

The intended use shall consist of restroom facilities for employees and patrons, however due to the nature of the carwash use intended the sanitary sewage generation from the site shall be substantially less than that associated with other permitted uses such as an office building. Therefore, there will be minimal adverse impacts on sanitary sewerage disposal associated with the proposed improvements.

I. Impact on Traffic Volume and Flow

A detailed Traffic Impact Statement was prepared by Dolan and Dean Associates for this project and concluded that there shall be no adverse impact upon surrounding properties or roadways as a result of this development.

J. Impact on Geologic Features

Based on the inventory of existing geologic characteristics onsite, it is evident that no significant geological features exist on site. Therefore, there are no adverse conditions that would prohibit or restrict development of the site as proposed. The proposed project will have no effect on the site's bedrock condition since U.S. Geologic Surveys have established the depth of bedrock in the Coastal Plain to be in excess of 1,000 feet. Therefore, it is our conclusion that the proposed site improvements will have little or no significant impact to onsite geology.

K. Impact on Topography

The proposed development will require regrading of existing topography. Alterations will occur primarily in the immediate vicinity of the proposed structures, the detention system and the circulation driveway.

Existing slopes on-site will be maintained to the greatest extent feasible and drainage paths will maintained or routed to the proposed onsite drainage facilities. All regrading will be carried out in accordance with an approved soil erosion and sediment control plan and no steep slopes will be created as a result of the proposed improvements. Therefore, there will be minimal adverse environmental impact to the on-site topography.

L. Impact on Historic or Archaeological Resources

Our site investigations found no evidence of historical or archaeological resources onsite. A review of the Marlboro Township Master Plan indicates that the site is not associated with any of the known Indian paths in Marlboro Township nor is the site listed as a municipal historic site or on the Monmouth County Historic Sites Inventory. Further, the subject site is not listed or potentially eligible for listing on the National Register and NJ Register of Historic Places therefore is our opinion that no historical or archaeological resources will be impacted by the proposed improvements.

M. Fiscal Impact

The intended development of the site shall result in an enhancement of assessed valuation of the site and consequently a positive impact upon the municipal tax base.

Municipal costs increase with the intensity of land use and change in real property value is a reasonable substitute for change in intensity of use. This is because the real property tax is frequently the most significant source of local revenue.

The construction of the proposed commercial development will unavoidably create a slight increase in demand for public services in the Township of Marlboro. These services would include, but not be limited to, increased demand on police protection and other public services. The increase in demand for public water and sewerage will be offset by the fees charged for these services and will not require an increase or upgrading for either of these public utilities.

It is expected that the increase in demands for services will be offset by the increase in tax base, which will be provided by the increase in tax revenues created by the construction of the commercial development.

Additionally, there is no observable adverse impact upon the health, safety and welfare of the public since the project is designed in accordance with local and regional development plans and objectives.

N. Construction Permits Required

For project compliance with the Planning Board Resolution of Approval, and prior to construction on the proposed site, the following construction permits will be required:

I. State

- NJDEP Stormwater Permit (5G3) – in conjunction with Freehold Soil permit application. This general permit authorizes point source discharges from certain construction activities. Regulated entities are required to develop a soil erosion and sediment control plan aimed at eliminating the flow of contaminated rainwater into streams and rivers. Once certification from the Freehold Soil Conservation District is received, a Stormwater 5G3 permit must be obtained prior to the start of construction.

II. County

- Freehold Soil Conservation District – Soil Erosion and Sediment Control Plan approval by the Freehold Soil Conservation District is required for any developments causing greater than or equal to 5,000 sf in disturbance.
- Road opening on county road (Tennent Road).
- Monmouth county planning board – the county planning board has statutory power to review all development plans that would affect county roads or drainage facilities. The county can oversee drainage from a regional standpoint and restrict drainage control facilities for projects that would..."cause stormwater to drain directly or indirectly to a county road or through any drainage way, structure, pipe, culvert or facility for which the county is responsible for construction, maintenance or proper functioning."

III. Municipal

- The Township of Marlboro will require Technical Review, Preliminary and Final Major Site Plan approvals. The applicant's approval from the Planning Board may be subject to receipt of all State, County and municipal permits/approvals.
- Tree Removal Permit issued by the Township of Marlboro Engineering Division.

5. IRREVERSIBLE IMPACTS TO NATURAL RESOURCES

A. Vegetation and Wildlife Habitat

Development of the subject property under the current proposal will require removal of vegetation. It should be noted that throughout the construction phase of the project, removal of trees will be kept to a minimum as much as possible where trees exist. The landscape plan will add trees and shrubs on the site and can be found within the civil engineering plan set prepared by Cranmer Engineering.

B. Air Quality

Construction is the only major aspect of potential air quality impacts for this specific site. During construction, pollutants would be emitted by construction vehicles (carbon monoxide, hydrocarbons, nitrogen dioxide, and particulates), along with fugitive dust from the disturbed area. Fugitive dust generation will be controlled through the implementation of temporary seeding procedures on exposed soils during construction in accordance with the approved Soil Erosion and Sediment Control Plan. With respect to fuel emissions from construction vehicles, air quality impacts will be temporary, and due to the good existing air quality in the area, should not cause any violation of the Ambient Air Quality Standards.

Once completed, no significant increase in air pollution is anticipated as a result of the operation of the commercial development. Therefore, it is not expected to cause a violation of the NJ Ambient Air Quality Standards.

C. Water Resources

The site will utilize a detention basin to control stormwater runoff and allow any pollutant load to settle out of waters to be discharged to existing wetland areas. The soil purification process is quite effective for removing residual pollutants through biological uptake, infiltration, adsorption and absorption.

Aquifer recharge potential is not expected to be significantly affected by construction of this project. It is not anticipated that site land use will degrade aquifer yield or potable water resources because the site's aquifer resources supply a limited number of domestic wells in this area. This site will utilize public water service for domestic water supply.

D. Topography

The proposed residential development will require some regrading of existing topography. Alterations will occur primarily in the immediate vicinity of the proposed commercial structure, the detention system and the access driveways.

6. ADVERSE ENVIRONMENTAL IMPACTS AND PROPOSED STEPS TO MINIMIZE THESE IMPACTS

A. Drainage, Soil Erosion and Sedimentation

1. New impervious surfaces created by rooftops and pavement areas will create increased storm water runoff. The runoff created by the addition of impervious rooftops will route to the car wash mechanical equipment for use in the car washing process and paving will be routed to a detention basin.

2. The detention basin will accommodate all additional runoff caused by the proposed development. The detained stormwater will be further treated through the use of a manufactured treatment device.
3. Regrading will be necessary to implement the project design. Erosion potential increases with the length and steepness of slope. A general rule is that if the length of slope is doubled, soil loss will increase by a factor of 1.5. The relationship between degree of slope (gradient between vertical height and horizontal length of slope) and erosion potential can be specified as follows:

- 10 percent or \geq = highly erodible
- 2 to 10 percent = moderately erodible
- 2 percent or \leq = slightly erodible

Erosion hazard is directly related to intensity and frequency of rain and wind.

Vegetative cover of varying types protects the soil from erosion. Most of the soils on the site have a 3 to 10 percent slope. Therefore, erosion potential is slight.

A Soil Erosion and Sediment Control Plan approved by the Freehold Soil Conservation District will be implemented prior to and during construction. Temporary seeding of any stockpiled topsoil will stabilize cut and fill material. After construction, erosion onsite will be reduced by installation of permanent vegetation.

Any potentially adverse impacts which could result from drainage, erosion or sedimentation will have been mitigated by the above measures.

B. Acid Soil Mitigation

The standards which address mitigation of exposure of acid producing deposits are contained in the Standards for Soil Erosion and Sediment Control in New Jersey. These standards apply to permanent vegetative stabilization of exposed acid-producing deposits, and they require that acid-producing soils (i.e., pH of 4 or less, or containing iron sulfides) be covered with a minimum of 12 inches of soil with a pH of 5 or more before seedbed preparation. The added soil shall be limed according to State Standards.

Through careful construction of the intended development, the physical areas and durations of exposures of acid-producing deposits can be minimized and any water body or wetlands associated with the site can be protected from acidification.

C. Vegetation and Wildlife Habitat Destruction

Development may affect a number of common species of birds, small mammals and perhaps reptiles found in the area. These may be forced to migrate elsewhere. Other species, such as whitetail deer and raccoon, would be less affected by loss of habitat resulting from the development and conversion of the land, as they have proven highly

adaptable to changing land use patterns in the Northeastern United States. Common mammals, such as deer, raccoon, opossum, skunk and woodchuck would also continue to use wooded areas on and around the periphery of the site.

In general, development of the project site will not result in a reduction of existing wildlife populations because this site has already been previously developed and disturbed. These species will also migrate. Suitable habitat options for existing wildlife species can be provided by adjacent undeveloped tracts.

Once the construction phase is complete, wildlife populations of the more common species should reach a balance in the area and continue to inhabit the landscaped and undeveloped portions of the site. The introduction of ornamental trees and shrubs, plus the establishment of lawn area and the preservation of wooded space should help encourage the re-establishment of these species in the developed area.

D. Air Quality Degradation

Local air quality may be temporarily affected by emissions from construction vehicles and delivery trucks during the construction of the commercial development. This effect will be minimal as emissions will not be excessive and dispersion of carbon monoxide is rapid over a spatial area.

To mitigate the potential of dust being raised during construction and grading activities, an approved Soil Erosion and Sediment Control Plan will be implemented. Temporary and permanent vegetative stabilization will minimize soil movement, thereby assuring the protection of air quality. Approved dust control measures will also be implemented, providing protection against off-site contamination.

An assessment that there will be no significant degradation of the ambient air quality as a result of project development is based upon regional data collection, and the fact that the surrounding area air quality is well within Federal and State defined parameters for acceptable air quality. Some increase in carbon monoxide from vehicular emissions is unavoidable. However, no post-development adverse impact will result from project construction.

E. Noise Abatement

Noise levels are controlled by the Township Noise Control Ordinance, which is enforced by the Township Police Department. This type of ordinance generally prohibits construction between early evening and early morning hours and regulates construction site noise standards, which establish maximum levels of sound permissible at the property boundary.

Noise created by construction equipment is further controlled by Federal and State regulations on equipment noise. The Noise Control Act of 1972 places limits on manufacturers of construction equipment for decibel levels that may be produced.

After construction, there will be a very small increase in ambient sound due to the amount of vehicular traffic entering and exiting the site, and process equipment of the car wash tunnel. Sound levels are expected to remain nearly at their current levels at this location. Therefore, it is not anticipated that there will be an adverse effect on residential and commercial sites in the area once construction is completed.

F. Public Costs

As previously addressed, there will be very slight increase in public costs as a result of constructing the intended development. It is expected that these increases in public cost will be adequately offset by the increase in tax base along with the fees charged by public utilities.

G. Loss of Open Space

As a result of the proposed development, there will be a loss of undeveloped on the subject property. The premises lie in a commercial zone, where open space is not elemental to the municipal master plan.

The intended commercial development has been designed to conform to the zoning standards enacted by the Marlboro Township Committee for the zone in which the premises lie, therefore no adverse impact to the community shall result.

H. Alternatives

The tract has been designed to be developed in a manner which benefits the Township, by providing additional revenues to the Township and benefits the region by providing a necessary car wash service in close proximity to densely populated areas.

The washing of vehicles at car wash facilities in lieu of at home minimizes the impact upon surface waters of the state by eliminating the discharge of detergents and surfactants. In comparison to a no-build option it is evident that the development of the site as proposed shall result in a net positive impact upon the community and the environment.

7. CONCLUSION

The construction of the intended car wash development will be accomplished according to State and local regulations governing engineering and environmental practices.

No natural resources, such as streams, flood plains, unusual geologic or topographic features, endangered species, wildlife or unique natural vegetative associations will be destroyed by the proposed construction.

No adverse impacts will affect public or private potable water or other infrastructure, either on or off-site. An analysis of published data indicates no adverse impact to air pollution or noise.

This report explains how the project will comply with local and State laws and regulations wherever encroachment upon environmentally sensitive lands will take place. Inasmuch as the laws and regulations were designed to provide guidelines and requirements that minimize environmental degradation, the issuance of permits and approvals will demonstrate compliance.

Therefore, the foregoing analysis has concluded that construction of the project as proposed will comply with all State environmental regulations in order to mitigate environmental impacts to the site and surrounding areas.

8. REFERENCES

1. Township of Marlboro Master Plan (January 2004 and amended August 2005).
2. Chapter 220 Land Use and Development Regulations, Township of Marlboro.
3. Google Maps Aerial Imagery and Street View Imagery, accessed on May 29, 2020.
4. NJ GeoWeb Interactive Web Mapping Application, New Jersey Department of Environmental Protection, accessed on May 28, 2020.
5. NJ Landscape 3.3 Viewer, New Jersey Department of Environmental Protection, accessed on May 28, 2020.
6. Web Soil Survey, USDA Natural Resources Conservation Service.
7. Tax Map Sheet 5, Township of Marlboro, July 2017.
8. U.S. Geological Survey Topographic Map for the Keyport, NJ Quadrangle, 2019.
9. Geology of Monmouth County in Brief, New Jersey Department of Environmental Protection, Bureau of Geology and Topography, August 1977.
10. Vegetation of New Jersey, B. Robichaud, and M.F. Buell, Rutgers University Press.
11. 2006 Air Quality Report. NJ Department of Environmental Protection, Division of Environmental Quality.
12. Peterson, R.T., and M. McKenney, 1968, A Field Guide to Wildflowers.
13. Petrides, G.A., 1972, A Field Guide to Trees and Shrubs.
14. New Jersey Department of Environmental Protection, Division of Water Resources, amended to August 2, 2004, Surface Water Quality Standards, N.J.A.C. 7:9-4.1 et seq.
15. The New Practitioner's Guide to Fiscal Impact Analysis, Burchell, Robert W. and Listokin, David, 1985.
16. Special Report No. 26, Geology and Groundwater Resources of Monmouth County, New Jersey, State of New Jersey Department of Conservation and Economic Development, 1968

APPENDIX A

USE VARIANCE RESOLUTION

**TOWNSHIP OF MARLBORO
ZONING BOARD OF ADJUSTMENT
RESOLUTION OF MEMORIALIZATION
MONMOUTH COUNTY, NEW JERSEY
BIFURCATED USE VARIANCE RELIEF**

**Approved: June 25, 2019
Memorialized: September 10, 2019**

MATTER OF TENNENT ROAD WASH & LUBE, LLC

APPLICATION NO. ZB 18-6670

WHEREAS, an application for bifurcated use variance relief has been made to the Marlboro Township Zoning Board of Adjustment (hereinafter referred to as the "Board") by Tennent Road Wash & Lube, LLC (hereinafter referred to as the "Applicant") on lands known and designated as Block 122, Lot 33, as depicted on the Tax Map of the Township of Marlboro (hereinafter "Township"), and more specifically located at 6 Tennent Road in the C-2 (Neighborhood Commercial) Zone; and

WHEREAS, public hearings were held before the Board on March 26, 2019 and June 25, 2019 with regard to this application; and

WHEREAS, the Board has heard testimony and comments from the Applicant, witnesses and consultants, and with the public having had an opportunity to be heard; and

WHEREAS, a complete application has been filed, the fees as required by Township Ordinance have been paid, and it otherwise appears that the jurisdiction and powers of the Board have been properly invoked and exercised; and

WHEREAS, the following exhibits were marked into evidence:

- A - 1 Application for Hearing
- A - 2 Petition on Appeal

- A - 3 Letter of Denial
- A - 4 Indemnification and Hold Harmless Agreement
- A - 5 Disclosure Statement
- A - 6 Tax Collector's Certification
- A - 7 Affidavit of Service
- A - 8 Affirmation of Local Pay to Play Ordinance
- A - 9 Conflict & Contribution Disclosure
- A - 10 Owner's Affidavit of Authorization and Consent
- A - 11 Notice To Adjoining Property Owners
- A - 12 List of Property Owners within 200 feet
- A - 13 Certified White Receipts and Green Cards
- A - 14 Affidavit of Publication
- A - 15 Check List for Bulk & Use Variances
- A - 16 W-9
- A - 17 Topographic Survey prepared by Ralph C. Ford, P.E., dated 8/22/18, consisting of 1 page
- A - 18 Variance Plan prepared by David A. Cranmer, P.E., dated 9/13/18, consisting of 1 page
- A - 19 Floor Plan prepared by Andrew F. Trocchia Jr., AIA, dated 9/14/18, consisting of 2 pages
- A - 20 Traffic Analysis prepared by Gary W. Dean, P.E., P.P., dated 11/19/18, consisting of 18 pages

- A - 21 Review letter prepared by Justin DiBiase, P.E., PTOE,
Remington & Vernick Engineers, dated 12/14/18, consisting of 3 pages
- A - 22 Review letter prepared by Laura Neumann, P.E., P.P., CME
Associates dated 7/3/18, consisting of 6 pages
- A - 23 Review letter prepared by Chris Weltner, Fire Official,
dated 1/16/18, consisting of 1 page
- A - 24 Cover Letter prepared by David A. Cranmer, P.E.,
dated 3/15/19, consisting of 2 pages
- A - 25 Revised Variance Plan prepared by David A. Cranmer, P.E.,
dated 9/13/18, revised 3/12/19, consisting of 1 page
- A - 26 Review letter # 2 prepared by Laura Neumann, P.E., P.P., CME
Associates, dated 3/21/19, consisting of 7 pages
- A - 27 Review letter prepared by Robert Nashe, P.E., Remington &
Vernick Engineers, dated 3/25/19, consisting of 3 pages
- A - 28 Revised Variance Plan prepared by David A. Cranmer, P.E.,
dated 9/13/18, revised 4/5/19 consisting of 1 page
- A - 29 Color rendering of Site Plan with landscaping prepared by David A.
Cranmer, P.E., submitted at hearing dated 3/26/19 consisting of 1 page
- A - 30 Notice To Adjoining Property Owners
- A - 31 Review letter prepared by Chris Weltner, Fire Official, dated
4/24/19, consisting of 1 page.
- A - 32 Review letter prepared by Laura Neumann, P.E., P.P., CME
Associates, dated 4/24/19, consisting of 7 pages
- A - 33 Review letter prepared by Sgt. John Loyer, Marlboro Township
Traffic & Safety, dated 4/26/19, consisting of 1 page.
- A - 34 PB 1099-13 Resolution Approved 3/19/14 Memorialized 4/7/14
consisting of 6 pages.

NOW, THEREFORE, does the Marlboro Township Zoning Board of Adjustment make the following findings of fact and conclusions of law with regard to this application:

1. The subject Property contains 38,084 s.f. of lot area and is located within the C-2 Zone District with 150 feet of frontage along the northerly side of Tennent Road (County Route 3) approximately 305 feet west of the New Jersey State Highway Route 79 intersection. The subject Property is vacant and predominantly wooded.
2. The Applicant is seeking bifurcated use Variance relief to construct a car wash and oil/lubrication service building on the site. Access is proposed by a channelized, paved access drive at the approximate midpoint of the site frontage providing looped, one-way circulation to and around the car wash portion of the building with paver block driveway to and from the service area of the building. Parking for twelve (12) vehicles, including two (2) handicap parking spaces, is proposed to the rear of the building and four (4) parallel vehicle spaces, for clean-out/vacuuming purposes, including an overhead canopy, are proposed east of the service building. A monument style site identification sign, building mounted signage and a refuse enclosure area are also proposed with this application.
3. A car wash and/or vehicle service (oil/lubrication) use is not a permitted principal, accessory or conditional use within the C-2 Zone District therefore requiring the requested Use Variance approval. The Applicant has requested only Use Variance approval at this time and shall be required to return before the Board for any Site Plan application and approval subsequent to the Use Variance approval, if granted.

The March 26, 2019 Hearing

4. The Applicant was represented by Mark Policastro, Esq. An Objector, Howard Heise, 22 Tennent Road, was represented by Marc Cohen, Esq.¹

5. David Cranmer, P.E., the Applicant's Engineer, introduced Exhibit A-28 which he testified represented a colorized rendering of the variance plan dated January 21, 2019 with landscaping added to that plan. He stated that the Exhibit was not intended for a full review at this time and would occur in a future site plan application should the Board approve the bi-furcated use variance relief sought by the Applicant.

6. Mr. Cranmer testified that the subject Property is an irregularly-shaped lot which contains 38,084 square feet (0.87 acres) of lot area and is located on the north side of Tennent Road in the C-2 (Neighborhood Commercial) Zone. He further testified that the minimum lot area required in the C-2 Zone is 3 acres and the subject Property contains 100 feet of frontage along Tennent Road where 300 feet is required. Mr. Cranmer stated that the subject Property is 135 feet wide where a 300-foot lot width is required.

7. Mr. Cranmer explained that the parcel is currently vacant and formerly contained a two-story residential dwelling which had been demolished. He explained that the Marlboro Township Planning Board granted approval for construction of an office building on the site in 2014, but that office building was never built. Mr. Cranmer further testified that the Applicant currently seeks use variance relief for construction of an exterior express car wash and lube facility, which is not a permitted use in the C-2 Zone. He explained that neither interior detailing of vehicles or extended vehicle maintenance or repairs would be performed on the subject Property. Mr.

¹ Mr. Cohen stated on the record that he had no jurisdictional objection to the Board prosecuting this land development application. Mr. Heise did not testify at the March 26, 2019 hearing. Mr. Heise and Mr. Cohen did not appear at the June 25, 2019 Hearing.

Cranmer testified that the Applicant also proposed the installation of four (4) self-serve vacuum units located along the easterly property line.

8. Mr. Cranmer confirmed that the Applicant proposed to create a walkway from the subject Property to the adjoining lot. He then explained that it was anticipated that customers of the proposed use would park on the adjoining lot and walk over to the subject Property. Mr. Cranmer confirmed that an agreement or easement has been executed between the parties for use of the adjoining lot.

9. The Board subsequently determined that the adjoining lot must be part of the application and the Applicant is required to re-notice for that hearing date and include the additional adjoining lot.

The June 26, 2019 Hearing

10. Mr. Cranmer continued his testimony before the Board. Mr. Cranmer testified that the subject Property is an undersized or irregularly shaped lot located in the C-2 Zone District. He stated the subject Property is currently vacant and previously contained a structure which was demolished prior to the date the Township Planning Board approved the application in 2014 for construction of an office building. He stated that office building was never constructed. He explained that all stormwater runoff would run to the east and west of the subject Property to an off-site receiving area. Mr. Cranmer explained that three (3) pre-existing non-conformities exist inclusive of 1) lot frontage where 300 feet is required and 150 feet is existing; 2) lot width where 300 feet is required and 135 feet exists; and 3) lot area where a 3-acre minimum is required and 0.878 acres exists.

11. Mr. Cranmer represented that a shopping center use is located north of the subject Property and residential uses and a gas station are located south of the subject Property. Mr.

Cranmer further testified that commercial uses exist to the west of the subject Property. He stated that the Applicant requests use variance relief for the construction of an Express Car Wash and Express Lube facility. Mr. Cranmer stated that the Express Car Wash facility would not provide detailing, interior vehicle cleaning or waxing services. He added that four (4) lube bays would be constructed and auto repair services would not be provided.

12. Mr. Cranmer stated that singular access to the subject Property would be from Tennent Road. He stated that the proposed queueing lane could accommodate twenty-two (22) vehicles and the Applicant further proposed to construct a bypass lane in the event a customer wishes not to proceed with the car wash. Mr. Cranmer stated that the Applicant proposed to construct an approximate 4,570 square foot building which would include the car wash tunnel and lube facilities. He explained that the proposed 0.12 Floor Area Ratio ("FAR") is compliant with the Ordinance. He stated that the 90-foot long car wash tunnel would contain 1,665 square feet and that the lube facility would contain 1,675 square feet. Mr. Cranmer added that the Applicant also proposed a 455 square foot customer waiting area for the lube facility. He added that the proposed building would have an attractive design and would fit with the neighborhood.

13. Mr. Cranmer testified that the Applicant proposed to install two (2) stormwater maintenance basins on the site and the Applicant proposed landscaping on-site which would breakup the impervious surfaces of the proposed uses. He stated that the proposed lot coverage of the subject Property would comply with the Ordinance. He further testified that the proposed driveway and two (2) stormwater basins would be consistent with the 2014 Planning Board approval for construction of an office building.

14. Mr. Cranmer testified that the Applicant also sought bulk variance relief for: 1) the driveway access where a 5-foot setback is required and a 1.8 foot setback from the easterly side

property line is proposed; 2) the parking space size where a 10 foot by 20 foot space is required and a 9 foot by 18 foot space size is proposed; 3) a 13.5 foot wide access lane where a 20 foot minimum width is required; 4) an 18-foot wide one-way drive along the rear of the building where a 25 foot wide drive is required; 5) the side yard setback to the westerly property line where 50 feet is required and a 19.7 foot setback is proposed; and 6) the number of parking spaces where eighteen (18) parking stalls were required and sixteen (16) parking stalls were proposed. He stated that five (5) queuing stalls would be located outside the four (4) lube bays. Mr. Cranmer testified that the Applicant would employ a maximum of eight (8) persons on the facility's busiest days. He further testified that the Applicant proposed 3 to 4 foot high retaining walls which were to line the proposed stormwater management facilities.

15. Mr. Cranmer stated that oil removal and oil deliveries would occur once every two (2) weeks. He stated that a non-articulated truck would pump old oil from a basement storage tank and that the same truck would deliver new oil to the subject Property. He stated that the old oil would not be stored in drums on-site.

16. The Applicant's Traffic Engineer, Gary Dean, P.E., testified that he prepared a traffic impact study on behalf of the Applicant. He explained that a typical permitted use in the C-2 Zone would generate 100 to 250 peak hour evening trips. He stated that this use would generate 0 evening peak hour trips for approximately 4-1/2 months out of the year due to shorter daylight in the winter. Mr. Dean further testified that 40 to 50 peak hour trips would be generated during the evening peak hours with virtually no a.m. peak hour business during the week. He further testified that approximately 100 Saturday morning peak hour trips would be generated. Therefore, he concluded that the peak hour trips for the proposed use would be less than most of the uses permitted in the C-2 Zone. He further testified that approximately 50% to 60% of traffic entering

the site would be pass-by traffic. Mr. Dean further testified that the lube facility would be a small traffic generator because a lube service would take 10 to 15 minutes and the Applicant proposed four (4) bays to perform that service. He further testified that the bypass allows for customers who do not wish to use the car wash facility to exit the subject property. Mr. Dean explained that a car wash conveyor would speed up the car wash time in the event that queueing backs up on busy days. He explained that the site can safely accommodate twenty-two (22) vehicles before vehicles would have to wait on the street for car wash services.

17. The Board expressed concern about conflict points between the oil change and car wash lanes. Mr. Dean testified that an employee would direct traffic on the site to avoid such conflict. He further explained that it was possible that access to the vacuums would be reduced or constrained during heavy volume. Mr. Dean estimated that there may be four (4) weekends per year where the car wash would get "slammed" during winter months.

18. Robert Nash, P.E., the Board's Traffic Engineer, expressed concern as to whether the Applicant considered the residential housing proposed to be built across the street from the subject Property. Mr. Dean stated that he would review the effect of those residential homes on the use and report his findings to the Board. The Board also noted that Tennent Road is a County Road. Mr. Dean further testified that he did not anticipate that an overflow of cars onto Tennent Road would occur on any busy weekend for the facility. Mr. Dean further testified that adequate space exists for the bypass lane and the exit lanes from the car wash and lube facility.

19. Marc Markowitz, the Applicant's representative, stated the Applicant operates nine (9) car wash facilities in New Jersey, Brooklyn and Connecticut. He stated that the proposed facility would provide express exterior car wash services only. Mr. Markowitz stated that the car wash conveyor can accommodate 25 to 30 cars per hour and the conveyor speed could be increased

to accommodate additional cars in order to reduce the queuing. He added that the Applicant proposed express exterior wash services only because the minimum wage would be increased to \$15.00 per hour and could not afford to provide full car wash service. Mr. Markowitz testified that the exit lane for lube facility would contain a yield sign. He further testified that a vehicle could use the bypass lane from any point in the queue lane to exit the site. Mr. Markowitz stated that his car wash facilities used only one lane 90 to 95% of the time. He acknowledged that any increase in conveyor speed might diminish the quality of the car wash. He did confirm that all customers would stay in their car and when entering the car wash tunnel.

20. The Applicant's Planner, Christine Nazzaro-Cofone, P.P., AICP, testified that the subject Property is located in the C-2 Zone and that a motor vehicle services use is a conditional use in that zone. She stated that the definition of "motor vehicle services" in the ordinance contemplated an oil change and car wash services, and she therefore concluded that the subject Property is particularly suitable for the proposed use. Ms. Cofone explained that while the subject Property was "seriously undersized," the proposed express exterior car wash and lube facility use would not require significant frontage on Tennent Road. She stated that these proposed uses would have less impact than other permitted uses in the C-2 Zone. Ms. Cofone explained that adequate space existed on the site for the two (2) queuing lanes and the proposed bypass lane. She further testified that the ordinance required eighteen (18) space queuing and the Applicant proposed queuing for up to twenty-two (22) vehicles on the subject Property. Ms. Cofone, therefore, concluded that the benefits of the proposed use outweigh any detriments and explained that the facility would have no adverse impact on the neighboring commercial properties. She testified that the use would not be substantially detrimental to the zone plan or the zoning ordinance. She further

testified the proposed use satisfies the goals of the Master Plan to promote continued growth of the Township's economic base in order to enhance economic viability.

21. Regarding the positive criteria for granting a use variance, Ms. Cofone testified that the application advances three (3) purposes of the Municipal Land Use Law pursuant to N.J.S.A. 40:55D-2. Specifically, Ms. Cofone stated that N.J.S.A. 40:55D-2g is satisfied as the project provides sufficient space for a variety of uses. N.J.S.A. 40:55D-2h is satisfied which promotes the free flow of traffic as the Applicant proposes separate queuing lanes and a bypass lane to channel traffic to, around and from the site. She added that N.J.S.A. 40:55D-2i is advanced as the improvements will upgrade the existing site and improve the aesthetics of the subject Property.

22. Regarding the negative criteria, Ms. Cofone testified that the project would not be a substantial detriment to the zone plan because the existing C-2 Zone permits a broad variety of more intense uses such as shopping centers, restaurants and convenience stores. She noted that the bulk variance relief would be subsumed into the Applicant's request for use variance relief. Therefore, the proposed express car wash and lube use for the C-2 Zone presents no substantial detriment to the zone plan or the Township's Land Use Ordinance.

23. Ms. Cofone concluded that the benefits of the project outweigh any detriments and those detriments would have to be substantial to prevent the Applicant from obtaining use variance relief.

24. The hearing was then opened to the public and Neal Betoff, 139 Yorkshire Drive, stated he supported the application.

25. Eric Nemers, 107 Rico Drive North, stated he also supported the application.

WHEREAS, the Marlboro Township Zoning Board of Adjustment, having reviewed the proposed application and having considered the impact of the proposed application on the Township

and its residents to determine whether it is in furtherance of the Municipal Land Use Law; and having considered whether the proposal is conducive to the orderly development of the site and the general area in which it is located pursuant to the land use and zoning ordinances of the Township of Marlboro; and upon the imposition of specific conditions to be fulfilled, hereby determines that the Applicant may be granted bifurcated use variance relief pursuant to N.J.S.A. 40:58D-70d(1).

Under the Municipal Land Use Law, a Board of Adjustment, when considering a "d" variance, cannot grant relief unless sufficient special reasons are shown and there is no substantial impairment of the intent and purpose of the zone scheme and Zoning Ordinance. In addition, the burden of proof is upon the Applicant to establish the above criteria. It is the Board's responsibility, acting in a quasi-judicial manner, to weigh all the evidence presented before it by both the Applicant and all objectors, and reach a decision which is based upon findings of fact and conclusions of law and is not arbitrary, unreasonable or capricious.

The New Jersey Courts have been willing to accept a showing of extreme hardship as sufficient to constitute a special reason. The courts have indicated that there is no precise formula as to what constitutes special reasons unless the use is determined to be inherently beneficial, and that each case must be heard on its own circumstances. Yet, for the most part, hardship is usually an insufficient criteria upon which the Board can grant a variance. In addition, special reasons have been found where a variance would serve any of the purposes of zoning as set forth in N.J.S.A. 40:55D-2. However, in the last analysis, a variance should only be granted if the Board, on the basis of the evidence presented before it, feels that the public interest, as distinguished from the purely private interests of the Applicant, would be best served by permitting the proposed use. In these instances, the Board must also find that the granting of the variance will not create an undue burden on the owners of the surrounding properties. The

Board also notes the special reasons requirement may be satisfied if the Applicant can show that the proposed use is peculiarly suited to the particular piece of property. With regard to the question of public good, the Board's focus is on the variance's effect on the surrounding properties and whether such effect will be substantial. Furthermore, in most "d" variance cases, the Applicant must satisfy an enhanced quality of proof and support it by clear and specific findings by this Board that the variance sought is not inconsistent with the intent and purpose of the Master Plan and Zoning Ordinance. The burden of proof is upon the Applicant to establish the above criteria.

The Board finds the Applicant has satisfied the positive criteria. The Board first notes that this is a bifurcated application. The Applicant must still return for preliminary and final site plan approval. The negative criteria also still carries to the site plan application. The Board finds that the subject site is an appropriate location for a commercial use which serves the citizens of the area. Based upon the proofs presented, the Board determined that the Applicant satisfied the positive criteria and that the granting of the application will promote the purposes of the Municipal Land Use Law. More specifically, the Board finds that the purposes of the Act would be advanced under the MLUL pursuant to N.J.S.A. 40:55D-2a general welfare; 2g) to provide sufficient space in appropriate locations for commercial uses; 2h) promote the free flow of traffic on the site; 2i) to promote a desirable visual environment through creative development techniques; and 2m) the approval of this application will result in more efficient use of land.

The Board also finds that the subject property has been previously approved for commercial purposes as an office building use by the Township Planning Board in 2014. Although, the office building use was approved, it was never constructed. Thus, the Planning Board has previously determined that this site is appropriate for development for commercial

purposes. The Board finds that in light of the past approval history of the use of this site for commercial purposes, it is appropriate to approve an express exterior car wash and lube facility use on the site. The Board also finds that the use promotes the general welfare because the proposed site is particularly suitable for the proposed use.

The New Jersey Supreme Court in Price v. Himeji, 214 N.J. 263 (2013) clarified the meaning and intent of the particularly suitable standard under N.J.S.A. 40:55D-70d(1). In Price, the court held "although the availability of alternative locations is relevant to the analysis, demonstrating that a property is particularly suitable for a use does not require proof that there is no other potential location for the use nor does it demand evidence that the project must be built in a particular location, rather, it is an inquiry into whether the property is particularly suited for the proposed purpose, in the sense that it is especially well-suited for the use, in spite of the fact that the use is not permitted in the Zone." In addition, in Northeast Towers Inc. v. Zoning Board of Adjustment of the Borough of West Paterson, 327 N.J. Super. 476, 497 (App. Div. 2000), the court held: "The concept expressed in Kohl as to the peculiar suitability of the location requires, however, that the use fits well within the surrounding area . . ." The Board finds that the proposed use is particularly suitable for the site for several reasons including, but not limited to, the site has been used in the past for commercial purposes. The approval of this application will also provide for a more productive use of the site. The proposed site is compatible with nearby commercial uses. Furthermore, the proposed development of the site effectively rehabilitates a long vacant property.

In addition to the positive criteria, an applicant for a use variance must also satisfy the negative criteria. The Board next conducted an analysis of the application under the negative criteria. Under the MLUL pursuant to N.J.S.A. 40:55D-70d, the statute provides that "no

variance or other relief may be granted under the terms of this section, including a variance or other relief involving an inherently beneficial use, without a showing that a variance or such other relief can be granted without substantial detriment to the public good and will not substantially impair the intent and purpose of the zone plan and zoning ordinance.

To satisfy the first prong in the negative criteria, a Board must evaluate the impact of the proposed use variance upon adjacent properties to determine whether the use will cause such damage to the character of the neighborhood to constitute substantial detriment to the public good.

In this matter, the Board finds that the approval of this application will not be substantially detrimental to the public good. The Board finds that the subject property is in close proximity to commercial properties on or near Tennent Road. The Board further finds that the site is being underutilized at the present time and has been for a considerable period of time. The Board further finds that the underutilization of this property constitutes economic waste. The Board further finds that the site would be modernized with a new car wash and lube building and the site will be readapted and used as a viable commercial property. The Board also determines that Tennent Road contains a variety of commercial uses in the area, including a shopping center, and a gas station. As a result, the Board determines that Tennent Road has been developed with a variety of commercial uses and, as such, an express exterior car wash and lube facility use is not out of character in this area.

The Applicant also satisfied the second prong of the negative criteria. The Applicant has amply demonstrated that the proposed use would not substantially impair the intent and purpose of the Zone Planning and Zoning Ordinance. The site contains adequate space for the car wash and lube access/egress and a third by-pass lane. The proposed site is being modernized and

updated with a new commercial building and additional architectural aesthetics. Landscaping will be provided to enhance the aesthetics of the building and the aesthetics of the site.

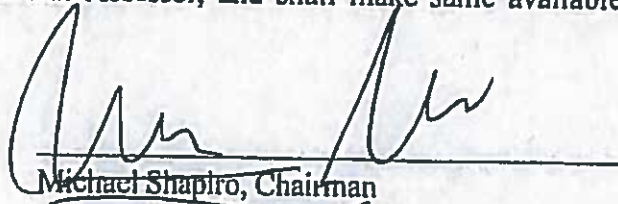
The Applicant also requires bulk or "c" variance relief under the MLUL for 1) the driveway access where a 5-foot setback is required and a 1.8 foot setback is proposed from the easterly side property line; 2) parking space size where a 10 foot by 20 foot space is required and a 9 foot by 18 foot space size is proposed; 3) 13.5 foot wide access lane where a 20 foot minimum width is required; 4) an 18-foot wide one-way drive along the rear of the building where a 25-foot wide drive is required; 5) the side yard setback to the westerly property line where 50 feet is required and a 19.7 foot setback is proposed; and 6) eighteen (18) parking stalls were required and sixteen (16) parking stalls were proposed. The Board notes that in circumstances where the application is for a use not permitted in the zone, the bulk regulations designed for that zone cannot be applicable to the intended use. A Zoning Board in its consideration of a use variance must then consider the overall site design. Therefore, bulk or "c" variances are subsumed within the granting of the d(1) use variance. Puleio v. North Brunswick Twp. Board of Adjustment, 375 N.J. Super. 613, 621 (App. Div. 2005). However, in the event the Board were required to grant bulk or "c" variance relief on their own merits, the Board finds that the Applicant's proofs were sufficient to grant the above-referenced bulk or "c" variances for the reasons stated herein.

NOW, THEREFORE, BE IT RESOLVED by the Zoning Board of Adjustment of the Township of Marlboro on this 10th of September, 2019, that the action of the Board taken on June 26, 2019, granting Application No. ZB 18-6670 of Tennent Road Wash & Lube, Inc. bifurcated use variance relief pursuant to N.J.S.A. 40:55D-70d(1) is hereby memorialized as follows:

The application is granted subject to the following conditions:

1. The development of the site shall take place in strict conformance with the testimony, plans and drawings which have been submitted to the Board with this application which are to be revised based on the Board's determination as follows:
2. Except where specifically modified by the terms of this Resolution, the Applicant shall comply with all recommendations contained in the reports of the Board's professionals.
3. Old oil shall not be stored in drums at any time on the subject Property.
4. The Applicant shall design appropriate stormwater management facilities in compliance with prevailing ordinance requirements.
5. The Applicant shall provide express exterior car wash and oil change services only.
6. Automobile detailing, waxing and interior cleaning shall not be permitted, except for self-service vacuums.
7. Automobile repair and body work services shall not be permitted.
8. The Applicant shall provide sixteen (16) parking spaces on the subject Property, including the four (4) vacuuming stalls.
9. The Applicant shall apply for preliminary and final site plan approval.
10. Payment of all fees, costs, escrows due or to become due. Any monies are to be paid within twenty (20) days of said request by the Board Secretary.
11. Subject to all other applicable rules, regulations, ordinances and statutes of the Township of Marlboro, County of Monmouth, State of New Jersey or any other jurisdiction.

BE IT FURTHER RESOLVED that the Board secretary is hereby authorized and directed to cause a notice of this decision to be published in the official newspaper at the Applicant's expense and to send a certified copy of this Resolution to the Applicant and to the Township Clerk, Engineer, Attorney and Tax Assessor, and shall make same available to all other interested parties.



Michael Shapiro, Chairman

Marlboro Township Zoning Board of Adjustment

MATT WEILHEIMER, Acting Chairman

ON MOTION OF: Michael Shapiro, Chairman

SECONDED BY: Mr. Zwerin

ROLL CALL: Mr. Solon, Mr. Viridi, Mr. Zwerin, Chairman Shapiro,
& Mr. Yuzzo

YES: (4) Mr. Solon, Mr. Viridi, Mr. Zwerin, Chairman Shapiro,

NO: (0)

ABSTAINED: (0)

ABSENT: (1) Ms. DiGrande

DATED: June 25, 2019

I hereby certify this to be a true and accurate copy of the Resolution adopted by the Marlboro Township Zoning Board of Adjustment, Monmouth County, New Jersey at a public meeting held on September 10, 2019.



Alan Zwerin, Secretary

Marlboro Township Zoning Board of Adjustment

APPENDIX B - LIST OF FIGURES

- Figure 1 – Tax Map
- Figure 2 – USGS Quad Map
- Figure 3 – Aerial Map
- Figure 4 – Site Photos
- Figure 5 – Construction Schedule
- Figure 6 – Bedrock Geologic Map of New Jersey
- Figure 7 – Surficial Geologic Map of New Jersey
- Figure 8 – NRCS Web Soil Survey
- Figure 9 – NJ GeoWeb Acid Soils
- Figure 10 – NJ GeoWeb Open Space
- Figure 11 – NJ GeoWeb Natural Heritage
- Figure 12 – NJ GeoWeb Wetlands
- Figure 13 – NJ GeoWeb Highlands, Pinelands, and CAFRA
- Figure 14 – NJ GeoWeb Groundwater Contamination
- Figure 15 – NJDEP Landscape Viewer Piedmont Plains Habitat Rank
- Figure 16 – US Fish & Wildlife Service IPaC Resource List

Google Maps

6 Tennent Rd

Highway 6, East Windsor



Imagery © 2020 Maxar Technologies, USDA Farm Service Agency, Map data © 2020 100 ft

Figure 5 – Site Photos



Photo #1: Facing Northeast towards intersection with Route 79. Project site is located on the left side in this photo (wooded area). Showing property border with Lot 34.

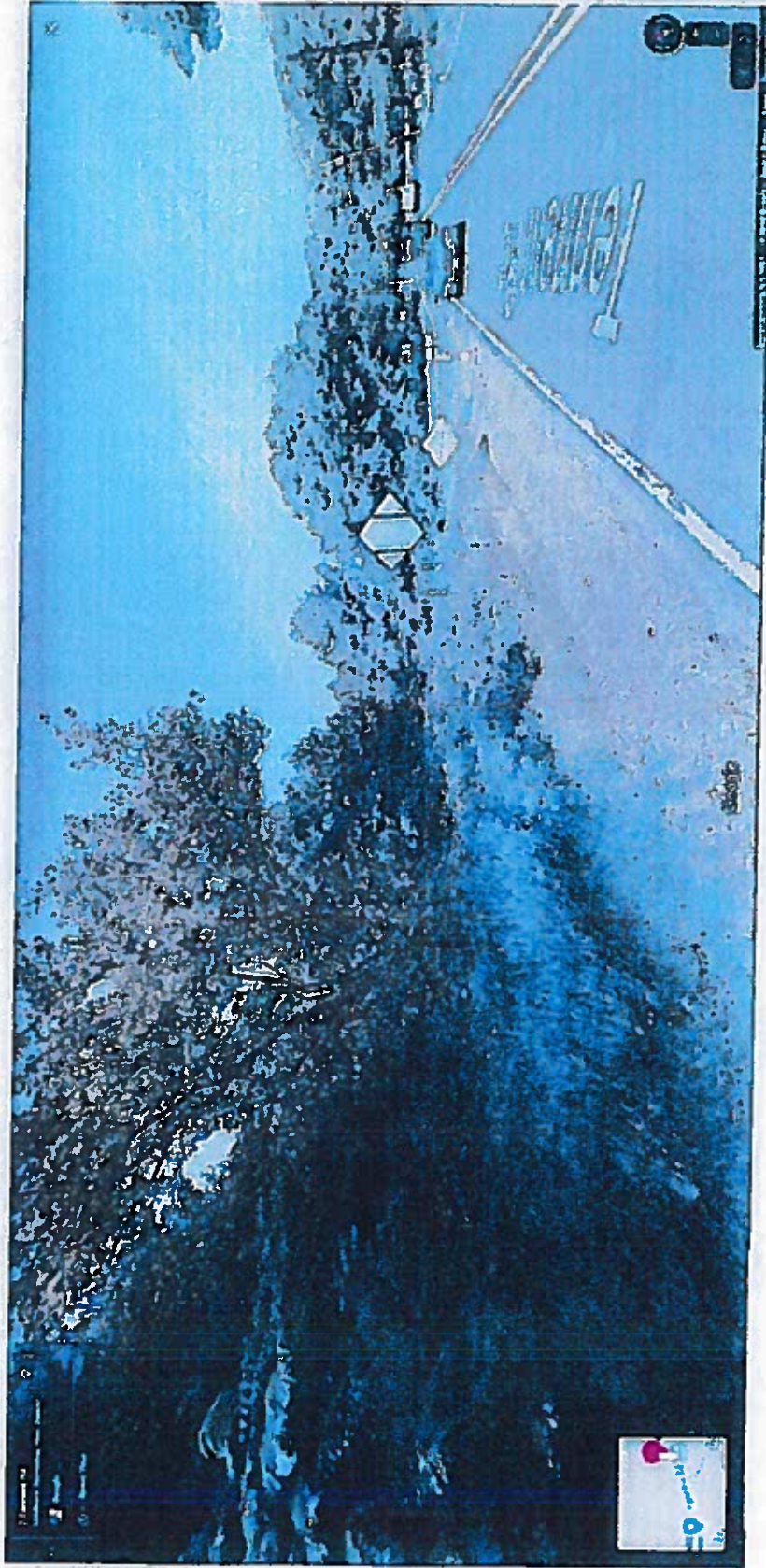


Photo #2: Facing Northeast towards intersection with Route 79. Project site is located on the left with frontage along Tennent Road.

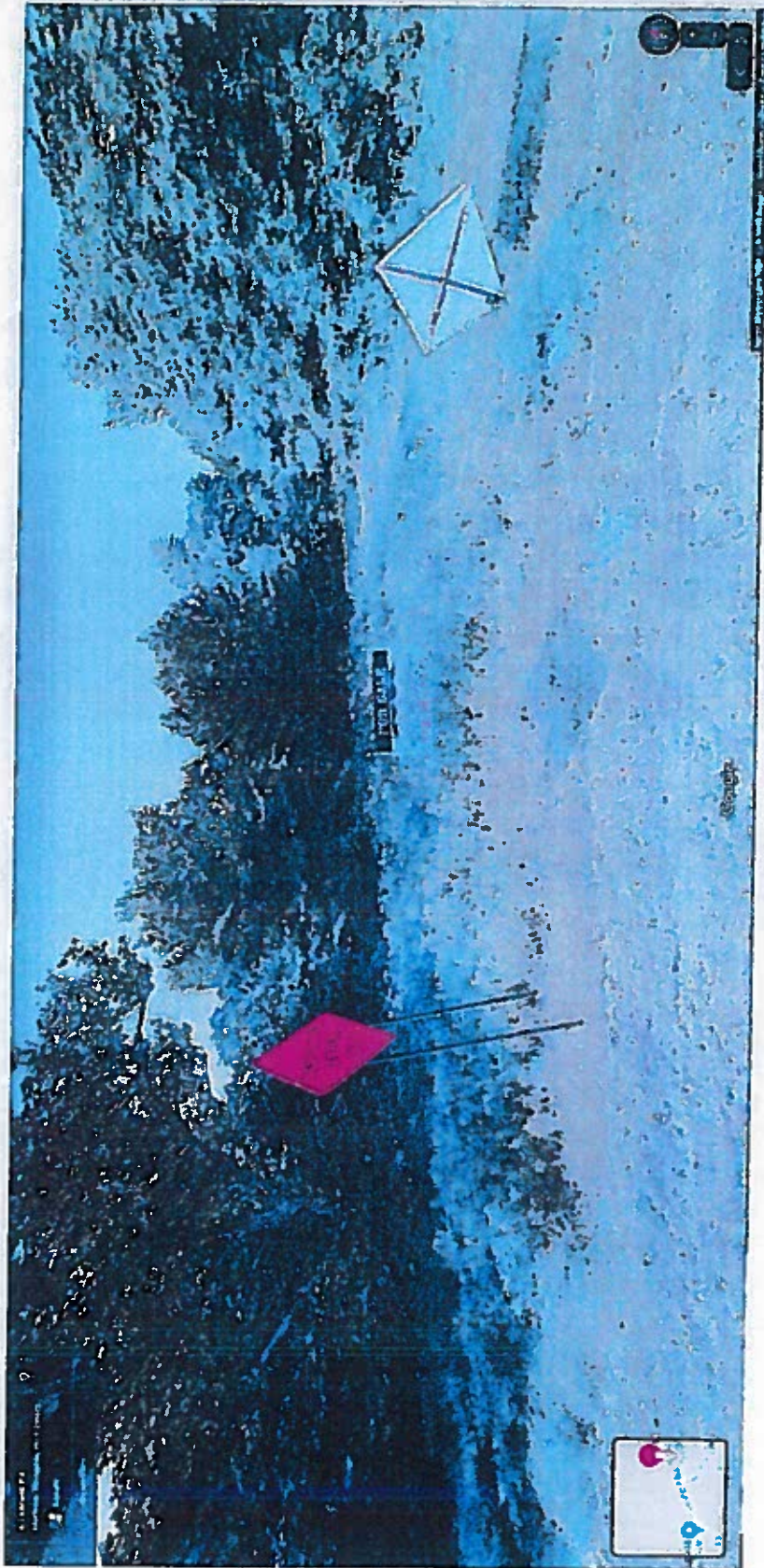


Photo #3: On Tennent Road facing property frontage.

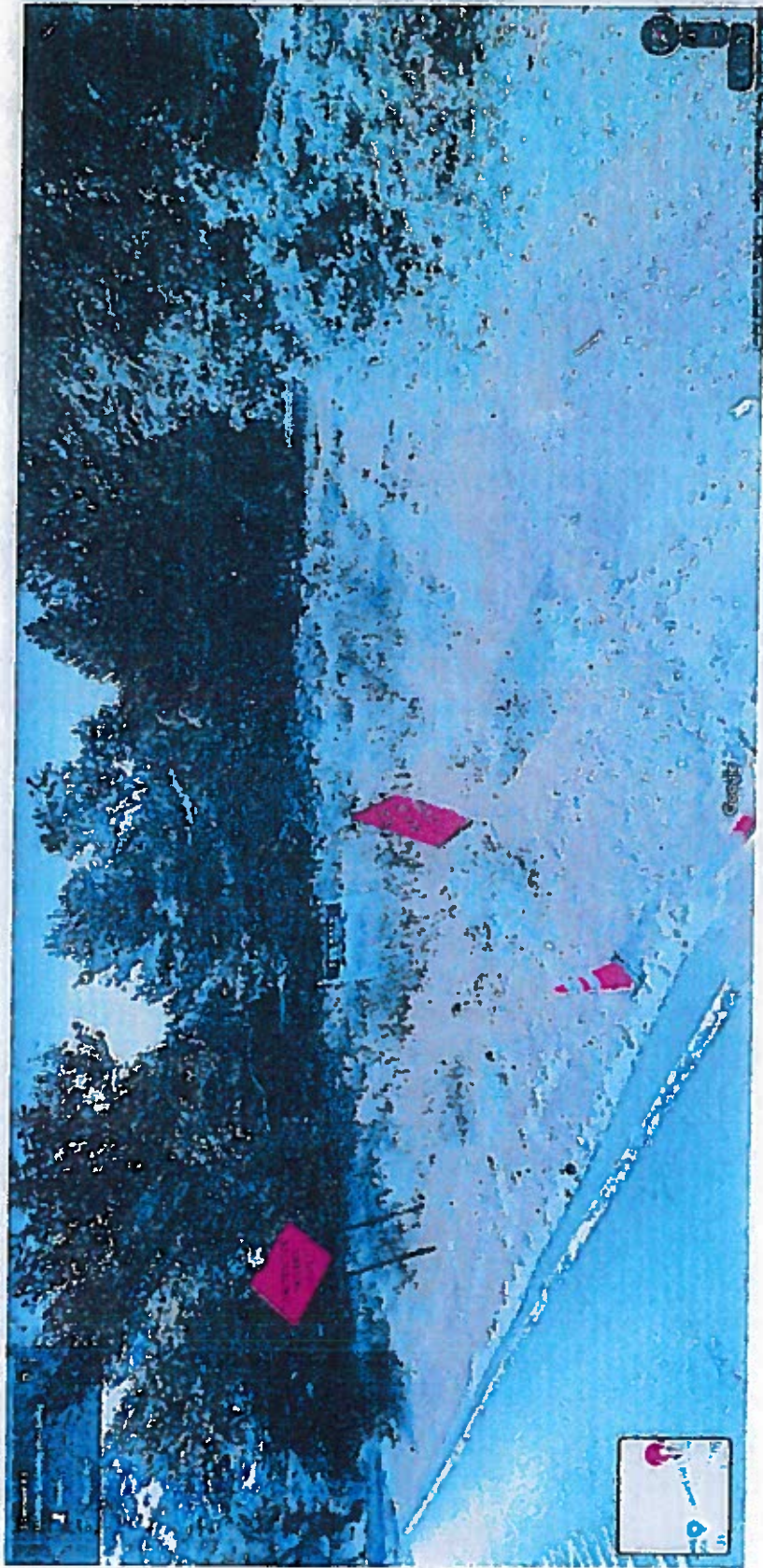


Photo #4: On Tennent Road, facing Southwest along property frontage.

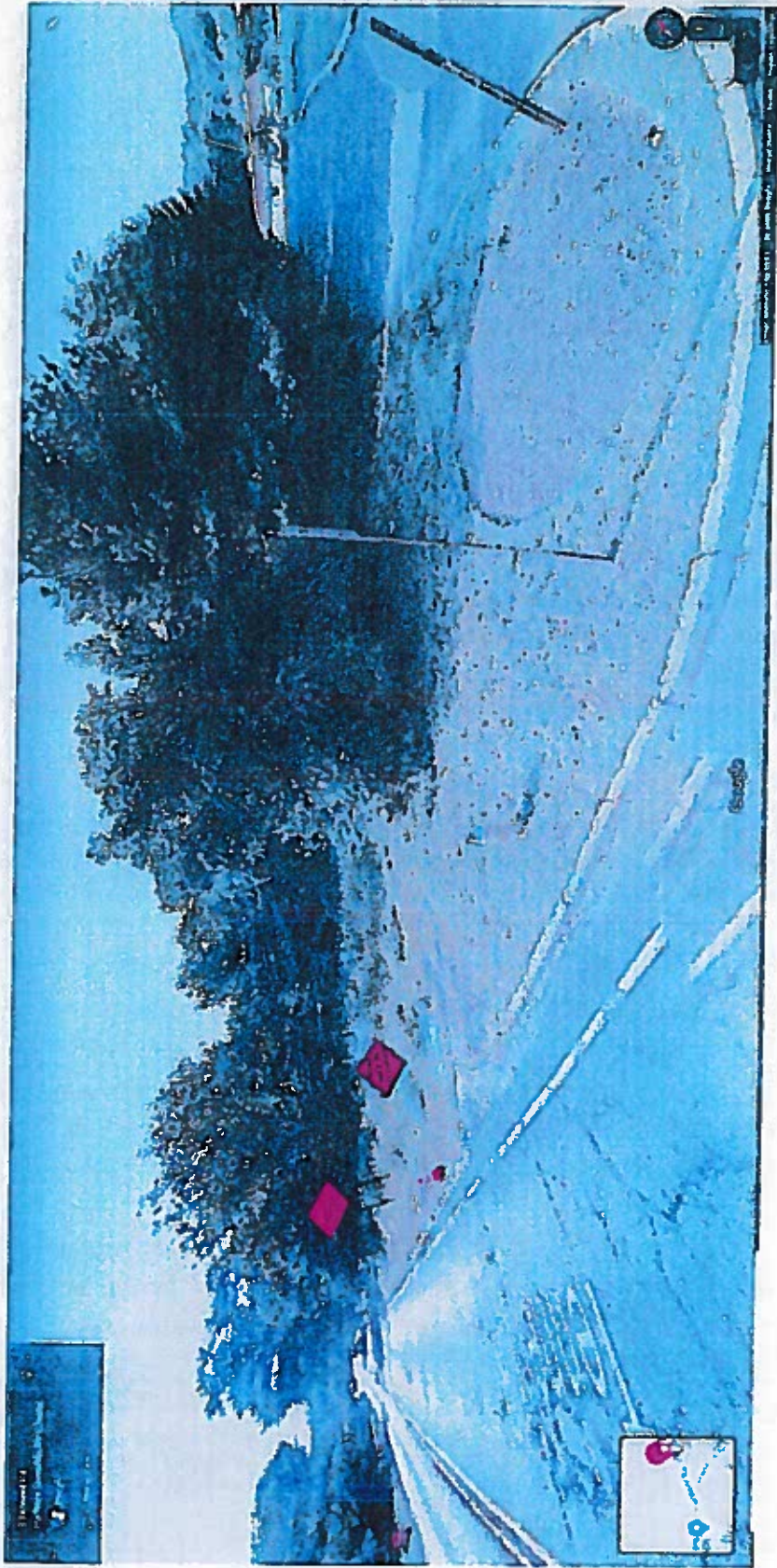


Photo #5: Facing Southwest along property frontage. Showing property border with Lot 32.

Note: All photos were accessed via Google Maps on May 29, 2020. These photos showing existing site conditions are from August 2018.

Figure 5 – Construction Schedule

Activity	Duration
Installation of soil erosion and sediment control measures	3 days
Stripping of topsoil clearing, grubbing	5 days
Construction of carwash	ongoing through completion
Rough grading and temporary stabilization	2 weeks
Installation of site amenities	4 weeks
Final grading and permanent stabilization	2 weeks
Soil de-compaction testing	1 day
Final cleanup and removal of soil erosion and sediment control measures	2 weeks

BEDROCK GEOLOGIC MAP OF NEW JERSEY

DESCRIPTION OF MAP UNITS

Sedimentary Rocks

CENOZOIC

- Holocene: beach and estuarine deposits
- Paleogene and Neogene: sand, silt, clay

MESOZOIC

- Cretaceous: sand, silt, clay
- Jurassic: siltstone, shale, sandstone, conglomerate
- Triassic: siltstone, shale, sandstone, conglomerate

PALEOZOIC

- Devonian: conglomerate, sandstone, shale, limestone
- Silurian: conglomerate, sandstone, shale, limestone
- Ordovician: shale, limestone
- Cambrian: limestone, sandstone

Igneous and Metamorphic Rocks

MESOZOIC

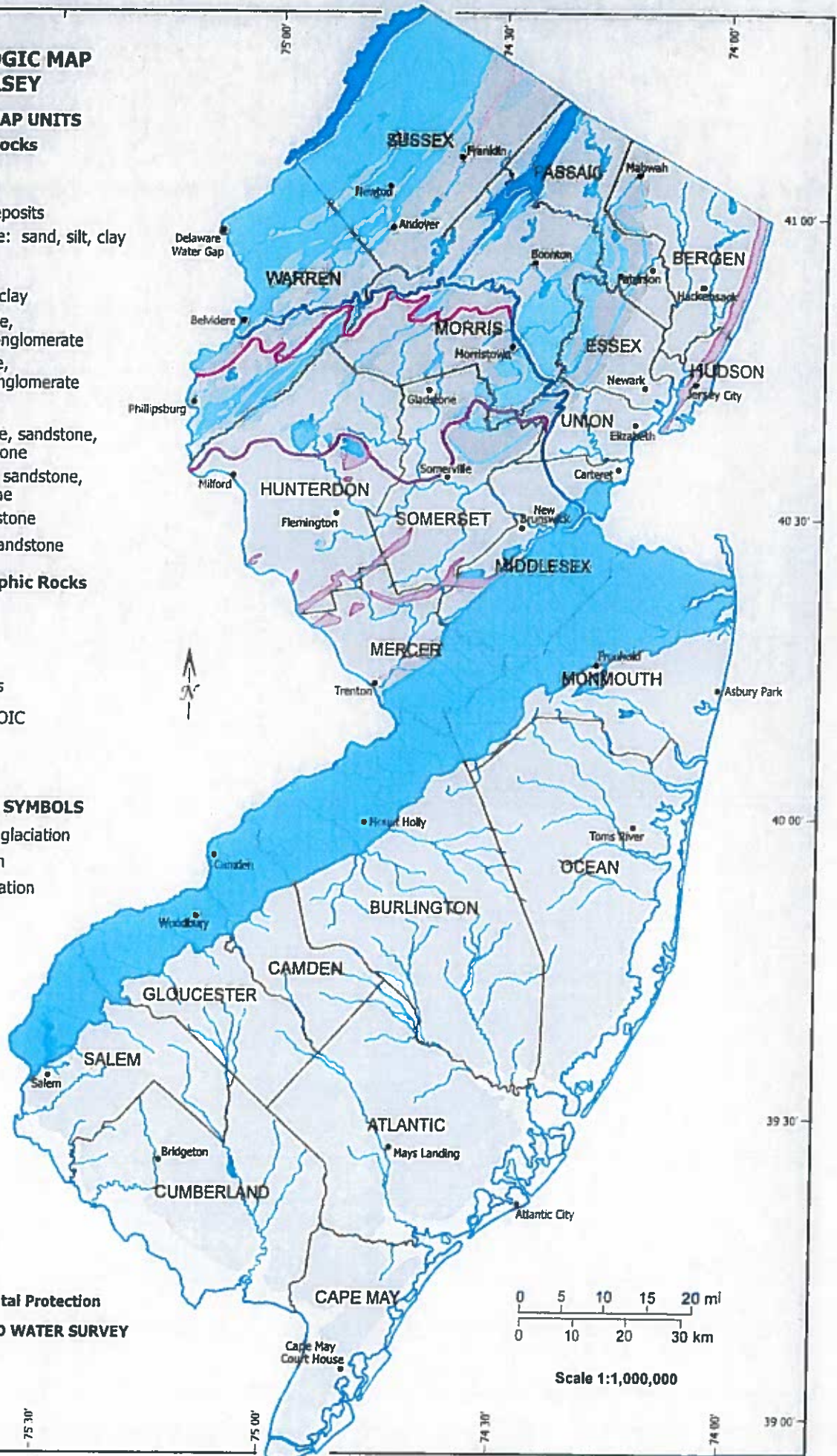
- Jurassic: basalt
- Jurassic: diabase
- Cambrian: schist, gneiss

MESOPROTEROZOIC

- marble
- gneiss, granite

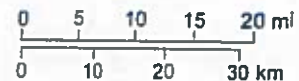
DESCRIPTION OF MAP SYMBOLS

- limit of late Wisconsinan glaciation
- limit of Illinoian glaciation
- limit of pre-Illinoian glaciation



Department of Environmental Protection
NEW JERSEY GEOLOGICAL AND WATER SURVEY

2016



Scale 1:1,000,000

76 00'

75 30'

75 00'

74 30'

74 00'

39 00'

Cape May Court House

Atlantic City

Mays Landing

Bridgeton

Salem

Woodbury

Camden

Trenton

Frankford

Asbury Park

Frankford

New Brunswick

Elizabeth

Carteret

Someville

Gloucester

Hunterdon

Phillipsburg

Belvidere

Andover

Franklin

Boonton

Paterson

Passaic

Warren

Delaware Water Gap

Newark

Hackettstown

Jersey City

Union

Essex

Bergen

Maunah

Hudson

Essex

Warren

Sussex

Passaic

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BEDROCK GEOLOGY OF NEW JERSEY

For an area of its size, New Jersey has a uniquely diverse and interesting geology. The state can be divided into four regions, known as physiographic provinces, which have distinctive rocks and landforms.

The *Valley and Ridge* Province is underlain by faulted and folded sedimentary layers of sandstone, shale, and limestone that range in age from Cambrian to Devonian (570 to 345 Ma [millions of years ago]). These rocks originated as sand, mud, and lime sediment deposited in former seas and floodplains. During Ordovician time (approximately 450 Ma) and again during Pennsylvanian and Permian time (approximately 300 Ma) the rocks were deformed by compression into folds and thrust along faults. As a result of the deformation, the originally flat sedimentary layers were tilted and now outcrop as linear belts.

Alternation of belts of erosion-resistant sandstone and easily-eroded shale and limestone creates the long, parallel northeast-southwest trending ridges and valleys characteristic of this province. Resistant sandstone and siltstone layers underlie Kittatinny Mountain and Walpack Ridge, shale and limestone underlie the valley of Flat Brook, the Delaware Valley upstream from the Delaware Water Gap, and the broad valley between Kittatinny Mountain and the Highlands to the east.

The limestone is quarried for construction material and cement aggregate. Some of the limestone units yield large quantities of groundwater. The shales and sandstones and some limestone units are generally less productive aquifers.

On the eastern edge of the Valley and Ridge Province, along a line from Franklin through Andover to the Delaware River just north of Phillipsburg, an irregular escarpment averaging 500 feet in height marks the boundary of the *Highlands* Province. The Highlands are underlain predominantly by granite, gneiss, and small amounts of marble of Mesoproterozoic age. These rocks, the oldest in New Jersey, were formed between 1.3 and 1 Ga (billions of years ago) by melting and recrystallization of sedimentary rocks that were deeply buried, subjected to high pressure and temperature, and intensely deformed. The Mesoproterozoic rocks are interrupted by several elongate northeast-southwest trending belts of folded Paleozoic sedimentary rocks equivalent to the rocks of the Valley and Ridge Province.

The granites and gneisses are resistant to erosion and create a hilly upland dissected by the deep, steep-sided valleys of major streams. The belts of sedimentary rock form long, parallel ridges and valleys (for example, Bearfort Mountain, Long Valley, and the Musconetcong Valley) that extend through the province.

The Highlands contain magnetite iron ore deposits that formerly supplied an industry of national importance. A mineralogically unique zinc ore in the Franklin Marble in Sussex County was worked until 1987. The ore, which fluoresces bright red and green, is in museums throughout the world. In places the rocks of the Highlands are quarried for crushed stone. The Mesoproterozoic rocks are generally unproductive aquifers except where they are fractured or weathered. The more productive aquifers of the region are the glacial deposits and some of the Paleozoic sedimentary rocks.

Rocks of the *Piedmont* Province are separated from the rocks of the Highlands Province by a series of major faults. The more resistant gneisses and granites on the upthrown northwest side of the faults make a prominent escarpment, 200 to 800 feet in height, extending from Mahwah through Boonton and Morristown to Gladstone, and from there westward in an irregular line to the Delaware River near Milford.

South and east of this escarpment, interbedded sandstone, shale, conglomerate, basalt, and diabase of the Piedmont Province underlie a broad lowland interrupted by long, generally northeast-southwest trending ridges and uplands. The rocks of the Piedmont are of Late Triassic and Early Jurassic age (230 to 190 Ma). They rest on a large, elongate crustal block that dropped downward in the initial stages of the opening of the Atlantic Ocean, one of a series of such blocks in eastern North America. These down-dropped blocks formed valleys known as rift basins. Sediment eroded from adjacent uplands was deposited along rivers and in lakes within the basins. These sediments became compacted and cemented to form conglomerate, sandstone, siltstone, and shale. They commonly have a distinctive reddish-brown color.

In the course of rifting, the rock layers of the Piedmont became tilted northwestward, gently folded, and cut by several major faults. Volcanic activity was also associated with the rifting, as indicated by the basalt and diabase interlayered with sandstone and shale. Diabase is a rock formed by the cooling of magma at some depth in the crust; basalt is formed by cooling of an identical magma that has been extruded onto the surface as lava. Both

basalt and diabase are more resistant to erosion than the enclosing sandstone and shale, and therefore they form ridges and uplands. The Palisades, Rocky Hill, Sourland Mountain, and Cushetunk Mountain are underlain by diabase layers. The Watchung Mountains, Long Hill, and Hook Mountain are underlain by basalt layers. Valleys and lowlands between these ridges are underlain by shale and sandstone. Along the northwestern margin of the basin a few areas of highly folded and faulted lower Paleozoic sedimentary rocks are exposed. Along the southern margin highly metamorphosed rocks ranging in age from Mesoproterozoic to Ordovician (1.3 Ga to 450 Ma) occur in the Trenton area and in Hudson County.

The basalt and diabase are extensively quarried for crushed stone. In the past, "brownstone" was widely quarried from sandstone units. Also, minor quantities of copper were extracted from sandstone and shale associated with the diabase and basalt. The basalt and diabase generally are poor aquifers but the sedimentary rocks are, in places, capable of yielding large quantities of water.

Southeast of a line roughly between Carteret and Trenton, unconsolidated sediments of the *Coastal Plain* Province overlap rocks of the Piedmont Province. These sediments, which range in age from Cretaceous to Miocene (145 to 5.3 Ma), dip toward the coast and extend beneath the Atlantic Ocean to the edge of the Continental Shelf. The Coastal Plain sediments thicken southeastward from a feathered edge along the northwestern margin of the province to approximately 4,500 feet near

Atlantic City to a maximum of more than 40,000 feet in the area of the Baltimore Canyon Trough, 50 miles offshore from Atlantic City. The sediments consist of layers of sand, silt and clay deposited alternately in deltaic and marine environments as sea level fluctuated during Cretaceous, Paleogene and Neogene time (120 to 10 Ma). These layers of sediment crop out in irregular bands that trend northeast-southwest. Wide areas of the Coastal Plain are covered by a thin veneer of Neogene and Quaternary (10 Ma to present) sand and gravel deposited by rivers.

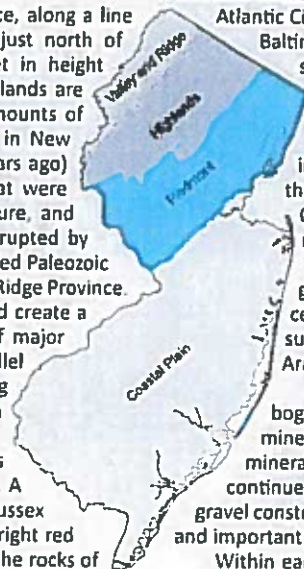
The topography of the Coastal Plain generally is flat to very gently undulating. However, erosion-resistant gravel or iron-cemented sediment underlie upland areas and isolated hills, such as the Atlantic Highlands, Telegraph Hill, Mount Holly, and Arneys Mount.

Coastal Plain sediments have been mined in the past for bog iron, glass sand, foundry sand, ceramic and brick clay, the mineral glauconite for use in fertilizer, and titanium from the mineral ilmenite in sand deposits. Today the Coastal Plain sediments continue to supply glass sand and are extensively mined for sand and gravel construction material. The sand formations are productive aquifers and important groundwater reservoirs.

Within each of these physiographic provinces there have been major changes during the past two million years. In this time New Jersey has undergone three glaciations, referred to as the pre-Illinoian, Illinoian, and late Wisconsinan. The last glacier (the late Wisconsinan advance) began to melt back from its maximum extent approximately 20 ka (thousands of years ago). North of the limit of the last glaciation much of the surface is covered by glacial deposits. Upland areas in this region are thinly draped with till, an unsorted mixture of sand, clay and boulders deposited directly from the glacier. Valleys and lowlands are filled with up to 350 feet of sand and gravel deposited from glacial meltwater and silt and clay that settled in glacial lakes.

The sand and gravel deposits are important sources of construction material, and productive aquifers are found where sand and gravel occur in buried or filled valleys. South of the limit of Wisconsinan glaciation, there are discontinuous patches of till from older glaciations. These deposits occur on uplands and are found as far south as the Somerville area.

During each glaciation, sea level dropped as water from the oceans was transferred to ice sheets. Rivers extended and deepened their valleys to conform to the lower sea levels. When the ice sheets melted, sea level rose, flooding the deepened valleys and establishing new shorelines. The present configuration of the coast is the result of the rapid post-glacial rise in sea level, which slowed approximately 7 ka. Many of the estuaries along the coast are the drowned lower reaches of former river valleys. To the east of the mainland, barrier islands were formed, and continue to be shaped, by erosion and deposition of beach sand by waves and currents. Mud and sand transported by rivers and from offshore is gradually filling the bays and estuaries between the mainland and the barrier islands, creating extensive wetlands.





United States
Department of
Agriculture

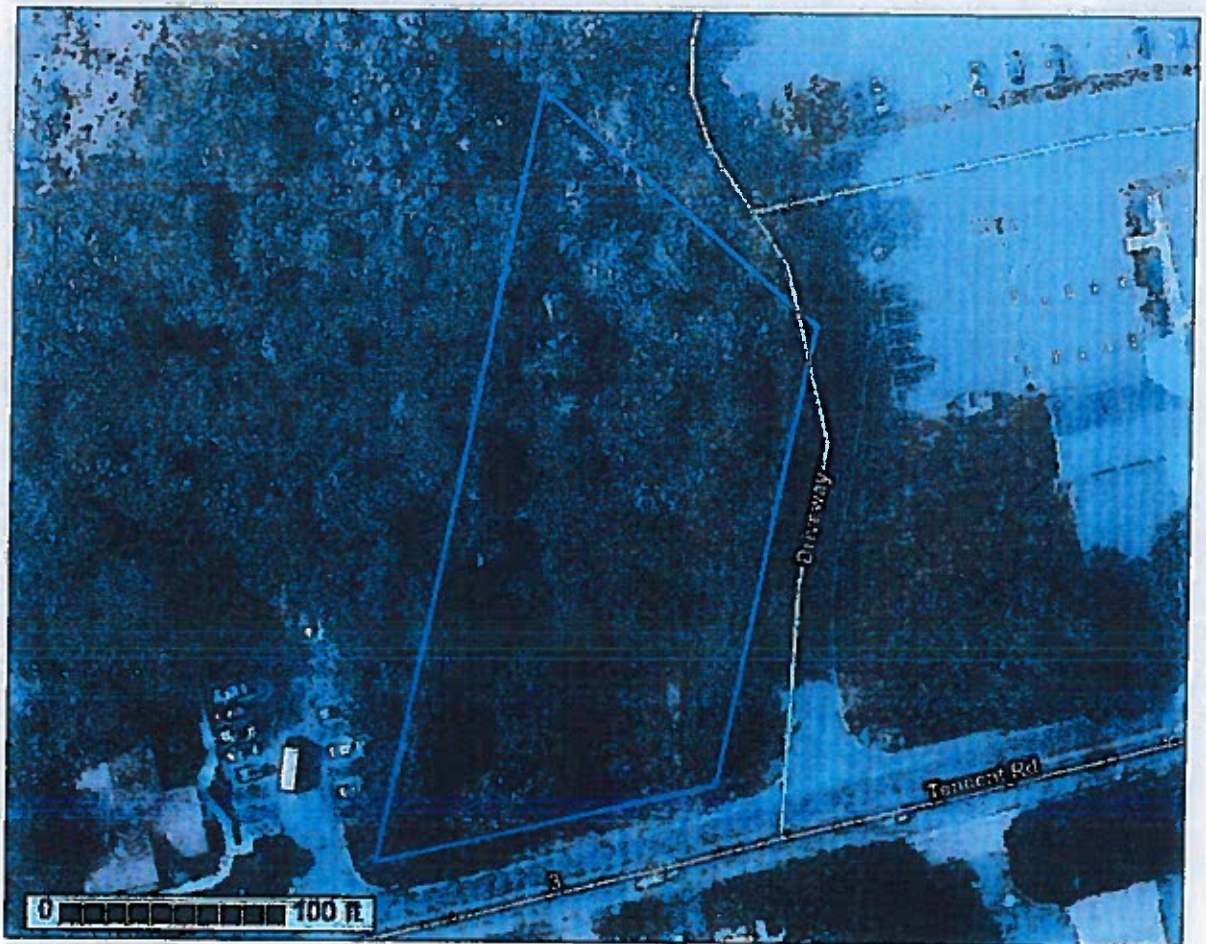
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Monmouth County, New Jersey

Proposed Car Wash



May 28, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

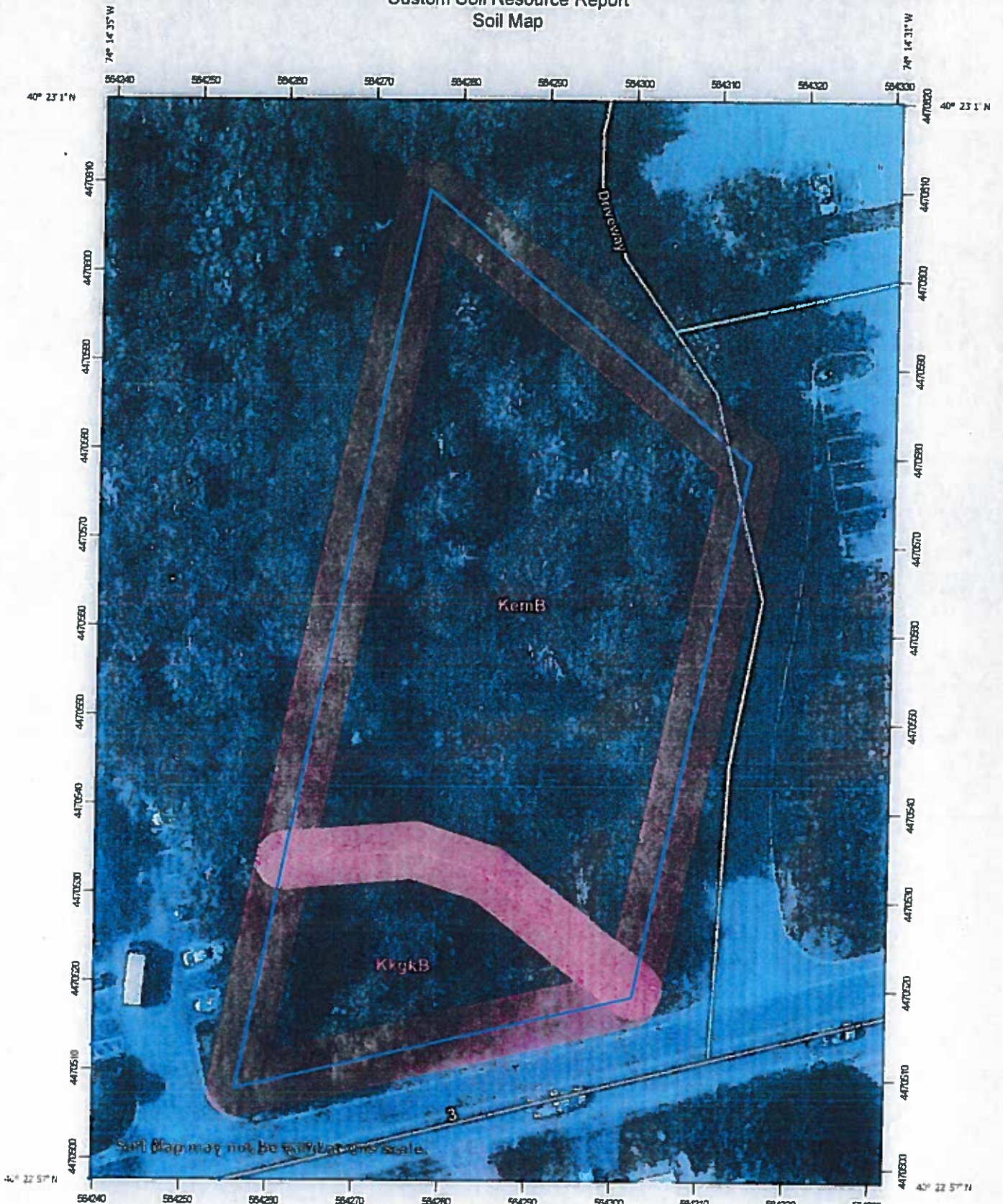
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

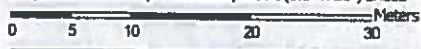
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:594 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

- Area of Interest (AOI)
 - Area of Interest (AOI)
 - Soils
 - Soil Map Unit Polygons
 - Soil Map Unit Lines
 - Soil Map Unit Points
- Special Point Features
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot
- Water Features
 - Streams and Canals
- Transportation
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background
 - Aerial Photography
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monmouth County, New Jersey
 Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 29, 2019—Jul 16, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres In AOI	Percent of AOI
KemB	Keyport sandy loam, 2 to 5 percent slopes	0.7	79.0%
KkgkB	Klej loamy sand, clayey substratum, 0 to 5 percent slopes	0.2	21.0%
Totals for Area of Interest		0.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

Custom Soil Resource Report

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Monmouth County, New Jersey

KemB—Keyport sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4j83
Elevation: 0 to 200 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Keyport and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Keyport

Setting

Landform: Flats, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Silty and clayey eolian deposits and/or silty and clayey fluvio-marine deposits

Typical profile

Ap - 0 to 12 inches: sandy loam
Bt1 - 12 to 18 inches: clay
Bt2 - 18 to 24 inches: clay
Bt3 - 24 to 32 inches: clay
Bt4 - 32 to 41 inches: clay
Cg1 - 41 to 55 inches: silty clay loam
Cg2 - 55 to 80 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Hydric soil rating: No

Custom Soil Resource Report

Minor Components

Lenni

Percent of map unit: 5 percent
Landform: Flats, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Elkton

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sassafras

Percent of map unit: 5 percent
Landform: Low hills, knolls
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Interflue
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

KkgkB—Klej loamy sand, clayey substratum, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1js1n
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Klej, clay substratum, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Klej, Clay Substratum

Setting

Landform: Dunes
Down-slope shape: Convex
Across-slope shape: Linear

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Parent material: Unconsolidated sandy marine deposits over clayey estuarine deposits

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material
Oe - 3 to 4 inches: moderately decomposed plant material
A - 4 to 14 inches: loamy sand
Bw - 14 to 40 inches: loamy sand
C - 40 to 46 inches: sand
2C - 46 to 60 inches: clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Shrewsbury

Percent of map unit: 5 percent
Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Atsion

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Saturated Hydraulic Conductivity (Ksat), Standard Classes

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits. The classes are:

Very low: 0.00 to 0.01

Low: 0.01 to 0.1

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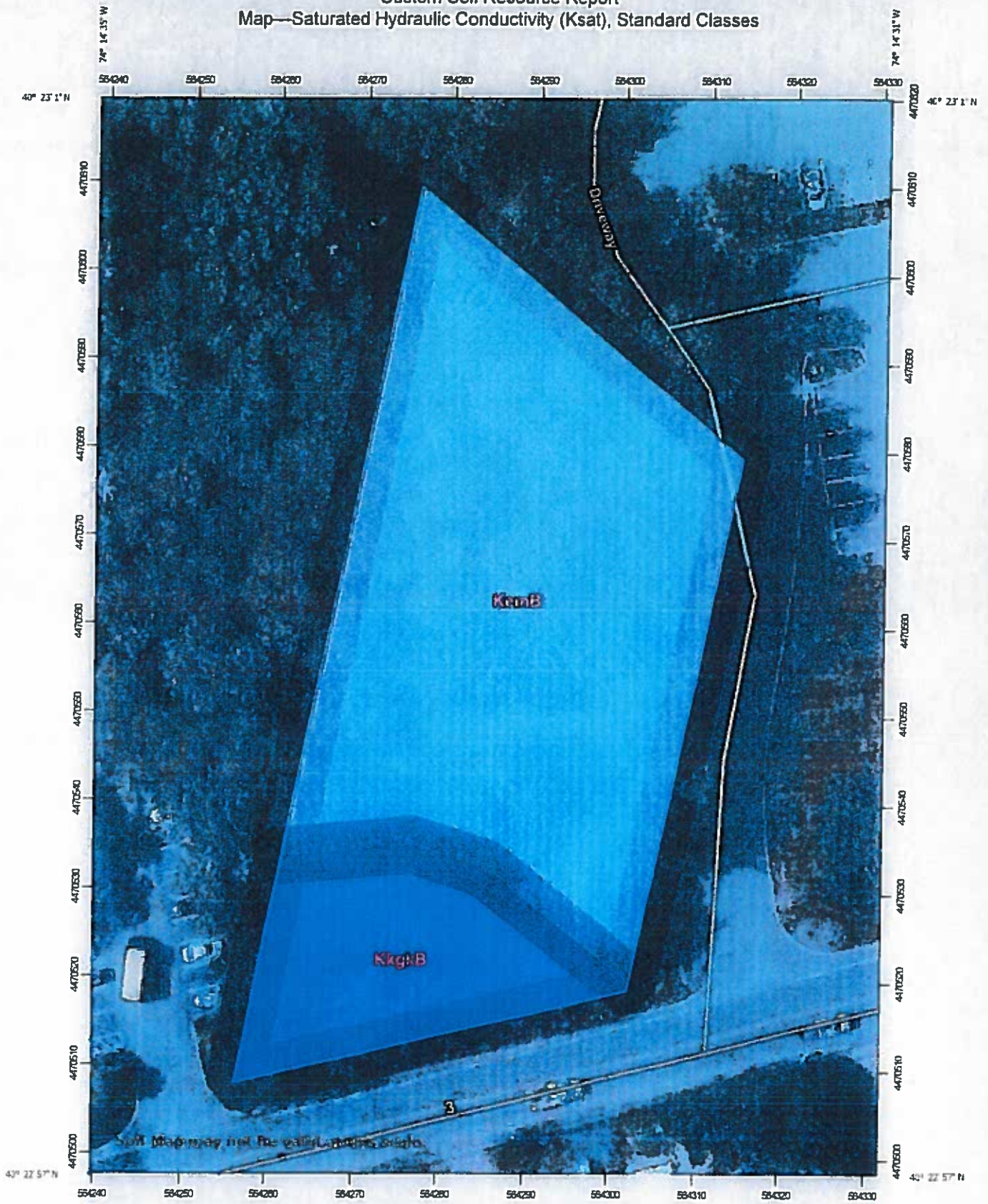
Moderately low: 0.1 to 1.0

Moderately high: 1 to 10

High: 10 to 100

Very high: 100 to 705

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat), Standard Classes



Map Scale: 1:594 if printed on A portrait (8.5" x 11") sheet.
0 5 10 20 30 Meters
0 25 50 100 150 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

- Area of Interest (AOI)
- Area of Interest (AOI) Not rated or not available
- Soils**
- Soil Rating Polygons**
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available
- Soil Rating Lines**
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available
- Soil Rating Points**
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monmouth County, New Jersey
 Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 29, 2019—Jul 16, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Table—Saturated Hydraulic Conductivity (Ksat), Standard Classes

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
KemB	Keyport sandy loam, 2 to 5 percent slopes	7.0506	0.7	79.0%
KkgkB	Klej loamy sand, clayey substratum, 0 to 5 percent slopes	70.3272	0.2	21.0%
Totals for Area of Interest			0.9	100.0%

Rating Options—Saturated Hydraulic Conductivity (Ksat), Standard Classes

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Custom Soil Resource Report

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

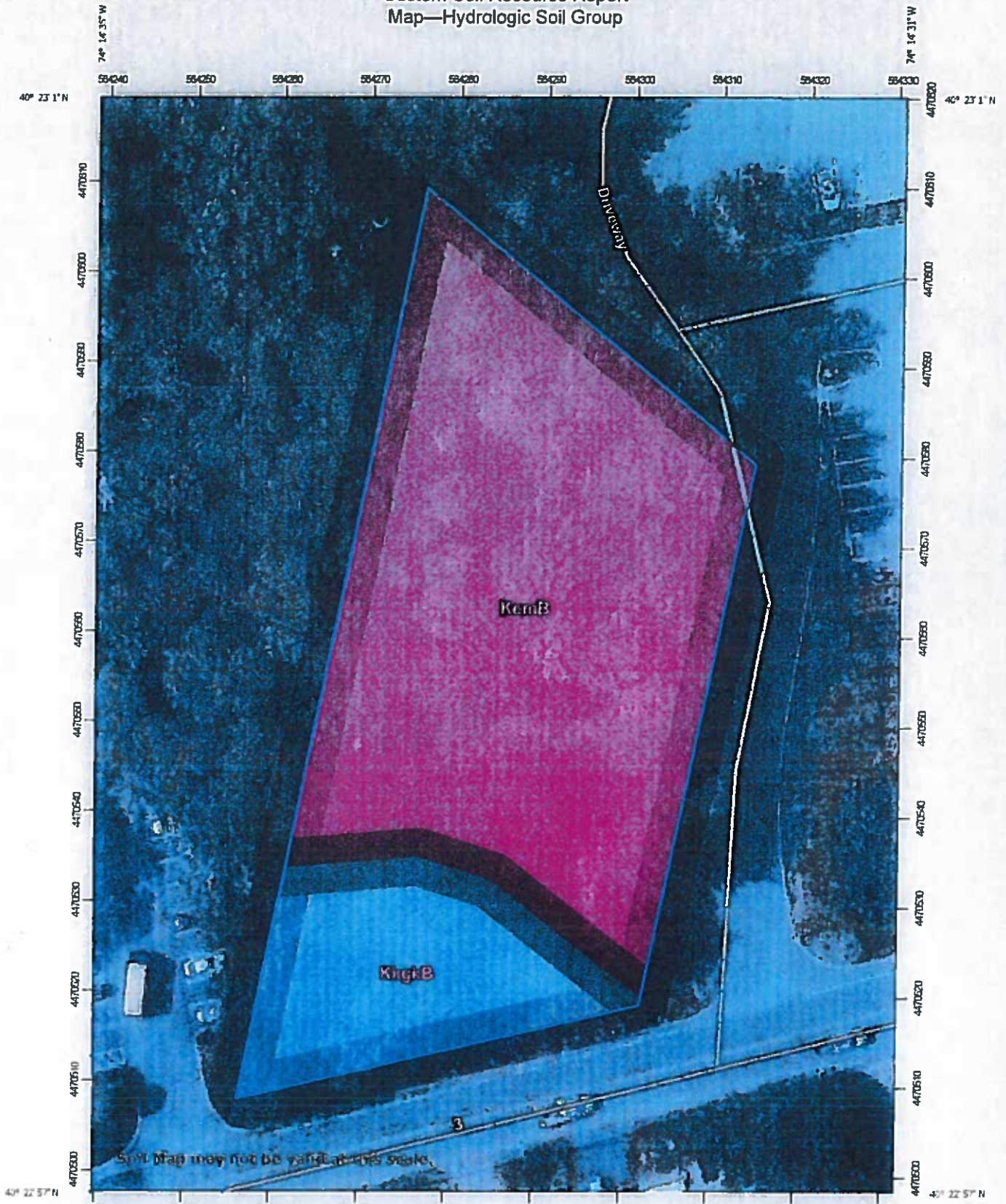
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:594 if printed on A portrait (8.5" x 11") sheet.

0 5 10 20 30 Meters

0 25 50 100 150 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)	C
Area of Interest (AOI)	C/D
Soils	D
Soil Rating Polygons	Not rated or not available
A	Water Features
A/D	Streams and Canals
B	Transportation
B/D	Rails
C	Interstate Highways
C/D	US Routes
D	Major Roads
Not rated or not available	Local Roads
Soil Rating Lines	Background
A	Aerial Photography
A/D	
B	
B/D	
C	
C/D	
D	
Not rated or not available	
Soil Rating Points	
A	
A/D	
B	
B/D	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Monmouth County, New Jersey
 Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 29, 2019—Jul 16, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KemB	Keyport sandy loam, 2 to 5 percent slopes	D	0.7	79.0%
KkgkB	Klej loamy sand, clayey substratum, 0 to 5 percent slopes	A/D	0.2	21.0%
Totals for Area of Interest			0.9	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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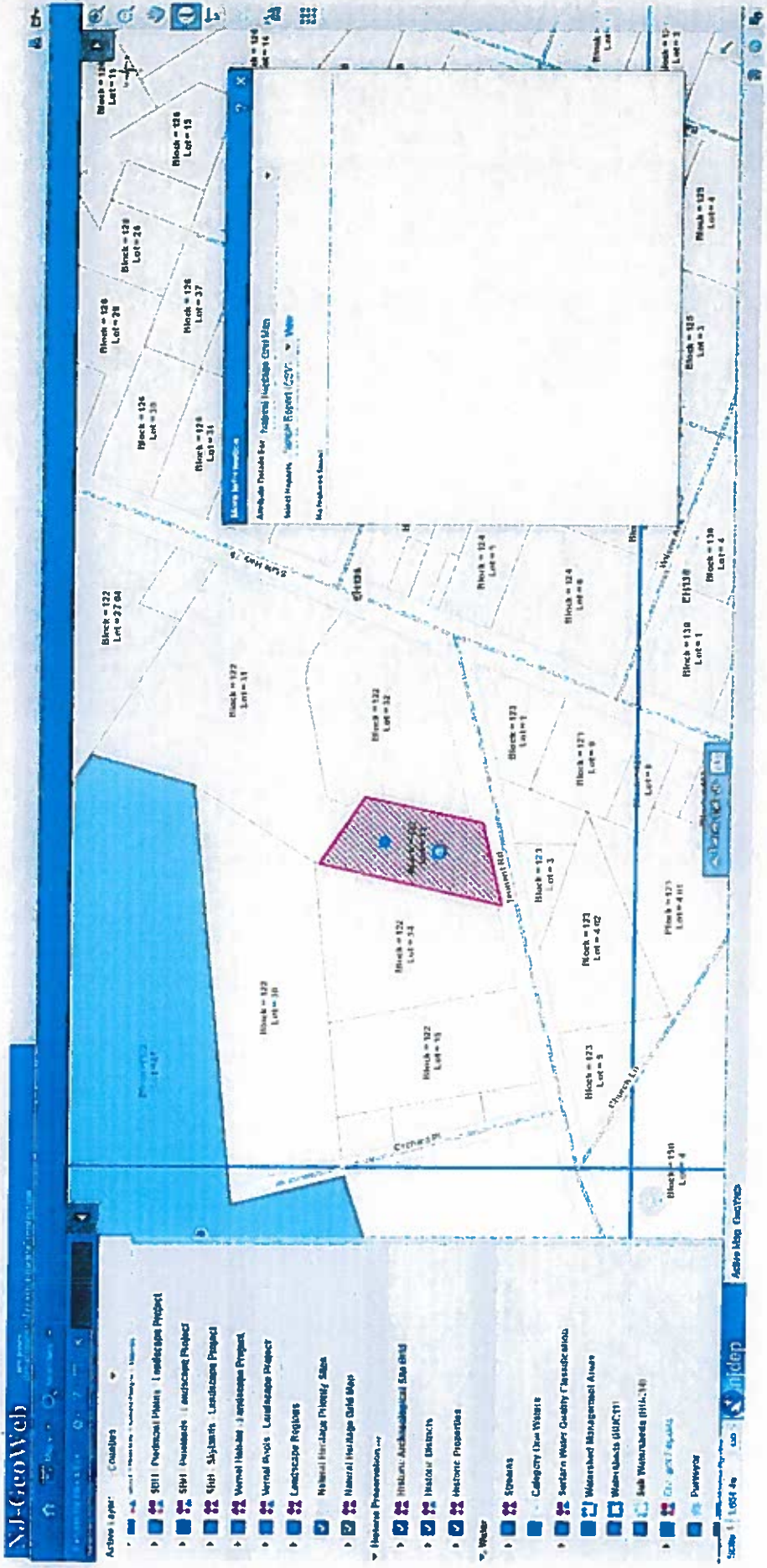
Custom Soil Resource Report

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NJ-GeoWeb

- Active Layers: **Contours**
- 5011 Periodical Plants | Landscaping Project
 - 5011 Invertebrate | Landscaping Project
 - 5151 Sphynx | Landscaping Project
 - 5151 Vernal Habitat | Landscaping Project
 - 5151 Vernal Ponds | Landscaping Project
 - 5151 Landscape Riparian
 - National Heritage Priority Area
 - National Heritage Old Map
 - National Preservation
 - National Archaeological Site GIS
 - National Districts
 - Historic Properties
 - Water
 - Streams
 - Category New Waste
 - Sediment Water Quality Classification
 - Watershed Management Area
 - Watersheds (SUACT)
 - Sub Watersheds (HUC-10)
 - County Aquatic
 - Postwater

Scale: 1:100000 | Active Map: Contours



City of Portland - Building Information System

Name	Address	City	State
1	1234 N. 10th St.	Portland	OR
2	5678 N. 11th St.	Portland	OR
3	9012 N. 12th St.	Portland	OR
4	3456 N. 13th St.	Portland	OR
5	7890 N. 14th St.	Portland	OR

City of Portland - Building Information System

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Monmouth County, New Jersey



Local office

New Jersey Ecological Services Field Office

☎ (609) 646-9310

📠 (609) 646-0352

4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205

<http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html>

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act requires Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are not shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

Northern Long-eared Bat *Myotis septentrionalis*
No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/9045>

Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the [FAQ below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
<p>American Oystercatcher <i>Haematopus palliatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935</p>	Breeds Apr 15 to Aug 31
<p>Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626</p>	Breeds Oct 15 to Aug 31
<p>Black Skimmer <i>Rynchops niger</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234</p>	Breeds May 20 to Sep 15
<p>Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399</p>	Breeds May 15 to Oct 10
<p>Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Jul 31
<p>Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Aug 10

Clapper Rail *Rallus crepitans*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 10 to Oct 31

Dunlin *Calidris alpina arctica*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

Golden-winged Warbler *Vermivora chrysoptera*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/8745>

Breeds May 1 to Jul 20

Gull-billed Tern *Gelochelidon nilotica*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9501>

Breeds May 1 to Jul 31

Least Tern *Sterna antillarum*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 20 to Sep 10

Lesser Yellowlegs *Tringa flavipes*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Breeds elsewhere

Nelson's Sparrow *Ammodramus nelsoni*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 15 to Sep 5

Prairie Warbler *Dendroica discolor*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Jul 31

Red-throated Loon *Gavia stellata*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

Ruddy Turnstone *Arenaria interpres morinella*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

Seaside Sparrow *Ammodramus maritimus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 20

Semipalmated Sandpiper *Calidris pusilla*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

Short-billed Dowitcher *Limnodromus griseus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9480>

Breeds elsewhere

Whimbrel *Numenius phaeopus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9483>

Breeds elsewhere

Willet *Tringa semipalmata*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 20 to Aug 5

Wood Thrush *Hylocichla mustelina*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ()

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any

week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

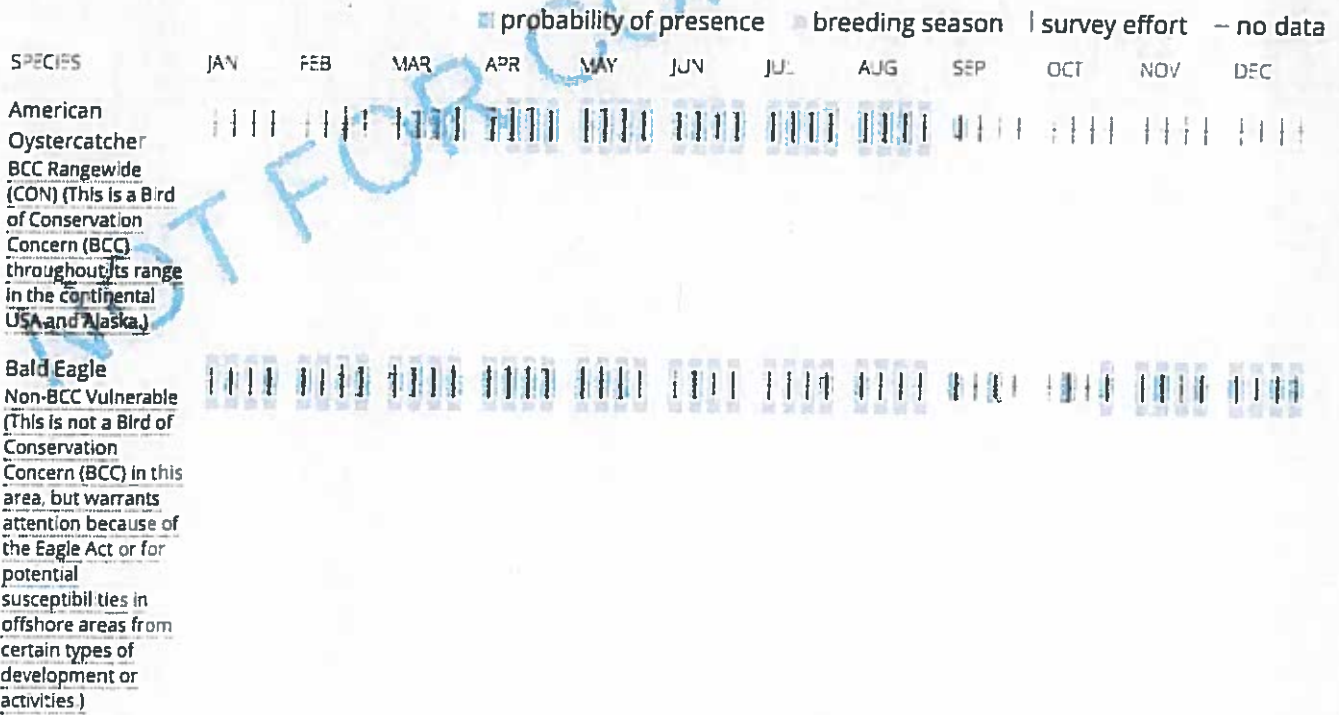
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Black Skimmer
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



**Black-billed
Cuckoo**
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Bobolink
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Canada Warbler
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Clapper Rail
BCC - BCR (This is a
Bird of Conservation
Concern (BCC) only in
particular Bird
Conservation Regions
(BCRs) in the
continental USA)



Dunlin
BCC - BCR (This is a
Bird of Conservation
Concern (BCC) only in
particular Bird
Conservation Regions
(BCRs) in the
continental USA)



**Golden-winged
Warbler**
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Gull-billed Tern
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)

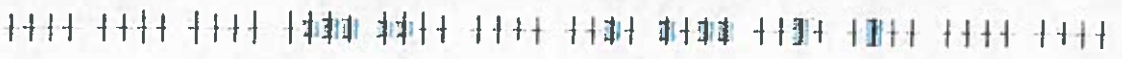


NOT FOR CONSULTATION

Least Tern
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska)



SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Nelson's Sparrow
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Red-throated Loon
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



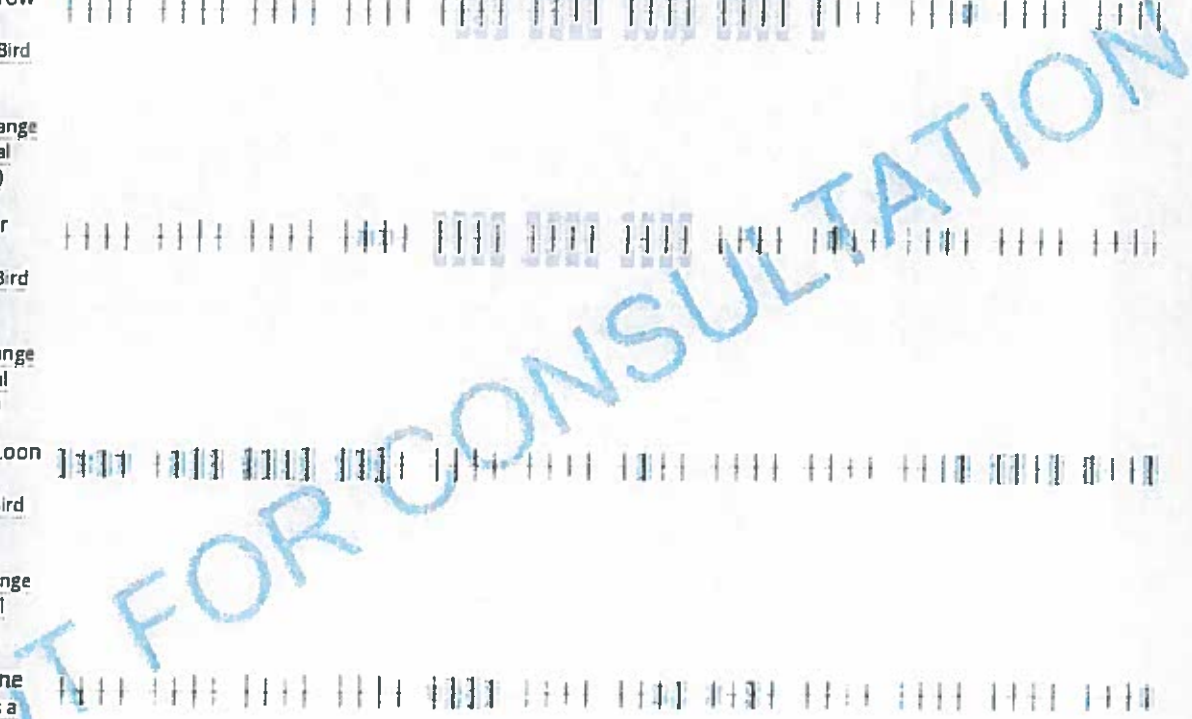
Ruddy Turnstone
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Seaside Sparrow
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



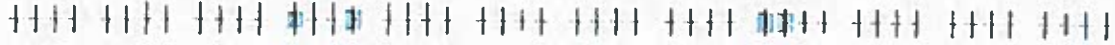
Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Short-billed
Dowitcher
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Whimbrel
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Willet
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Wood Thrush
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern \(BCC\)](#) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX C

**SOIL BORING LOGS AND
PERMEAMETER TEST RESULTS**

Block 122, Lot 33 Marlboro Township
LOGGED BY: VINCENT CREEVY

DEPTH SOIL LOG #1--4/2/2010

SOIL DESCRIPTION

- 0-13" 10YR 4/3 , brown , sandy loam
slightly dry,subangular blocky, friable, slightly plastic
*****NO WATER OR MOTTLES OBSERVED
- 13"-40" 10YR 5/8 yellowish brown , loamy sand
slightly dry,subangular blocky, friable to loose, non-plastic
*****NO WATER OR MOTTLES OBSERVED
- 40"-92" 10YR 6/4 light yellowish brown , loamy sand
slightly dry,subangular blocky, friable to loose, non-plastic
*****NO WATER OR MOTTLES OBSERVED SAMPLE @ 42"
- 92"-145" 10YR 7/3 very pale brown , loamy sand
slightly moist,subangular blocky, friable, non-plastic
***MOTTLES 10YR 6/6 @ 95" (common, medium, distinct) WATER @ 108"

Block 122, Lot 33 Marlboro Township
LOGGED BY: VINCENT CREEVY

DEPTH SOIL LOG #2--4/2/2010

SOIL DESCRIPTION

- 0-10" 10YR 4/3 , brown , sandy loam
slightly dry,subangular blocky, friable, slightly plastic
*****NO WATER OR MOTTLES OBSERVED
- 10"-42" 10YR 5/8 yellowish brown , loamy sand
slightly dry,subangular blocky, friable to loose, non-plastic
*****NO WATER OR MOTTLES OBSERVED
- 42"-85" 10YR 6/4 light yellowish brown , loamy sand
slightly dry,subangular blocky, friable to loose, non-plastic
*****NO WATER OR MOTTLES OBSERVED SAMPLE @ 43"

85"-146" 10YR 7/3 very pale brown , loamy sand
slightly moist,subangular blocky, friable, non-plastic
***MOTTLES10YR 6/6 @ 75" (common, medium, distinct) WATER @ 84"

Block 122, Lot 33 Marlboro Township
LOGGED BY: VINCENT CREEVY

DEPTH SOIL LOG #3—4/2/2010

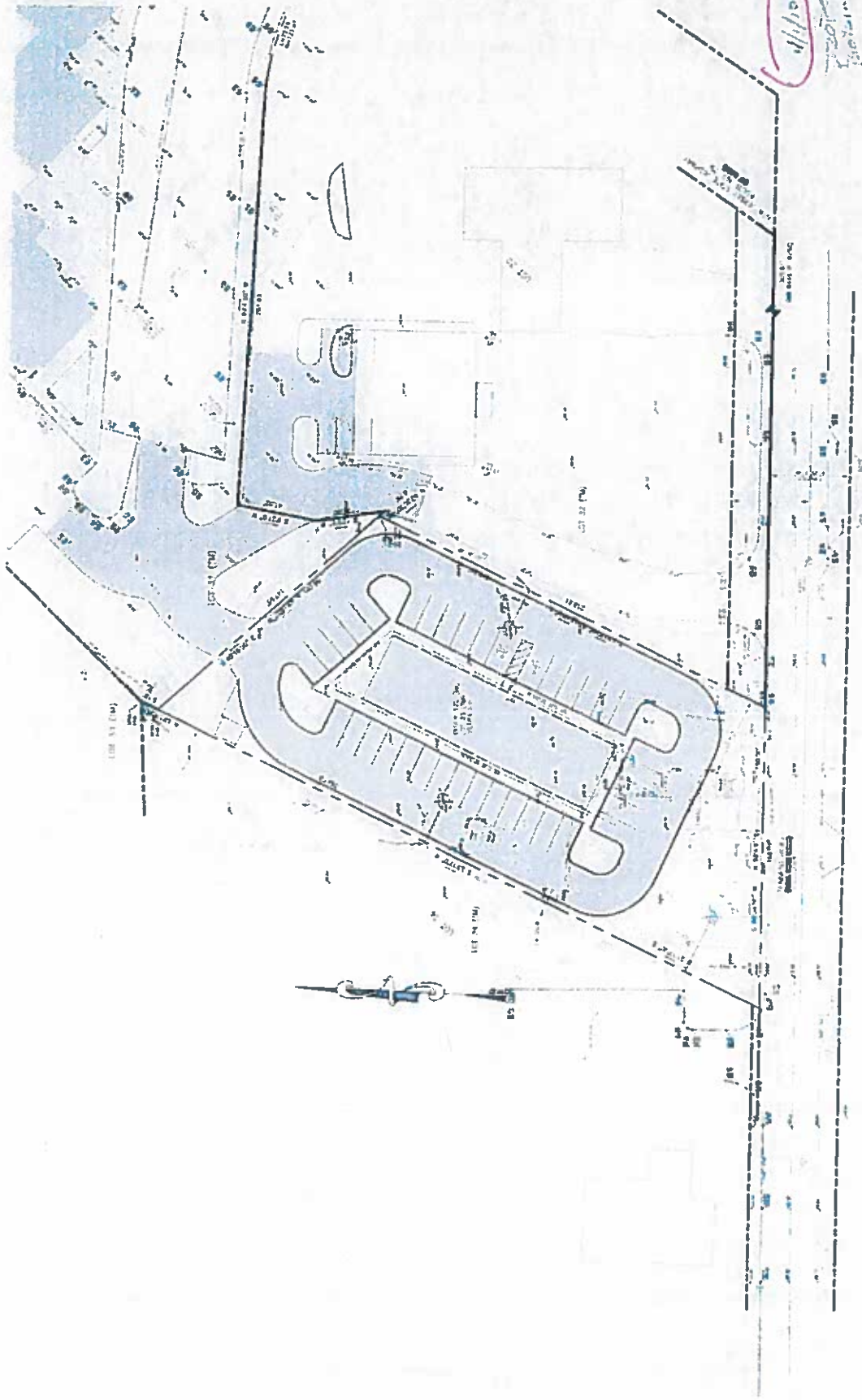
SOIL DESCRIPTION

0-8" 10YR 4/3 , brown , sandy loam
slightly dry,subangular blocky, friable, slightly plastic
*****NO WATER OR MOTTLES OBSERVED

8"-39" 10YR 5/8 yellowish brown , loamy sand
slightly dry,subangular blocky, friable to loose, non-plastic
*****NO WATER OR MOTTLES OBSERVED

39"-74" 10YR 6/4 light yellowish brown , loamy sand
slightly dry,subangular blocky, friable to loose, non-plastic
*****NO WATER OR MOTTLES OBSERVED SAMPLE @ 40"

74"-144" 10YR 7/3 very pale brown , loamy sand
slightly moist,subangular blocky, friable, non-plastic
***MOTTLES10YR 6/6 @ 83" (common, medium, distinct) WATER @ 94"



4/1/10

2009 SE 7th Ave
 Portland, Oregon 97214

J. ARCOCK

1" = 30'

Form 3b. Tube Permeameter Test Data: Block 122, Lot 33 Marlboro Twp.

1. Test Number Log-1 Replicate (letter) A Date Collected 4/2/2010

2. Material Tested: Test in Native Soil – Indicate Depth 42"

3. Type of Sample: Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.5"

5. Bulk Density Determination: N/A

6. Standpipe used: No Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:

*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

0.083min./inch
0.083min./inch
0.083 min./inch
0.083min./inch
0.083min./inch
0.083min./inch

9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.5" / 0.083$$
$$\times \ln(7.0/6.0) = 21.4 \text{ in/hr} = K-5$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator _____ Date 4/2/2010
Vincent Creevy

Signature of Professional Engineer _____ Date 4/2/2010
David A Cranmer, P.E., P.P., Lic. No.

Form 3b. Tube Permeameter Test Data: Block 122, Lot 33 Marlboro Twp.

1. Test Number Log-1 Replicate (letter) B Date Collected 4/2/2010

2. Material Tested: Test in Native Soil – Indicate Depth 42"

3. Type of Sample: Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.25"

5. Bulk Density Determination: N/A

6. Standpipe used: No Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:

*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

0.07 min./inch
0.07 min./inch
0.07 min./inch
0.07 min./inch
0.07 min./inch
0.07 min./inch

9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.25" / 0.07$$
$$\times \ln(7.0/6.0) = 23.57 \text{ in/hr} = K-5$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator _____ Date 4/2/2010
Vincent Creevy

Signature of Professional Engineer _____ Date 4/2/2010
David A Cranmer, P.E., P.P., Lic. No.

Form 3b. Tube Permeameter Test Data: Block 122, Lot 33 Marlboro Twp.

1. Test Number Log-2 Replicate (letter) A Date Collected 4/2/2010

2. Material Tested: Test in Native Soil – Indicate Depth 43"

3. Type of Sample: Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.25"

5. Bulk Density Determination: N/A

6. Standpipe used: No Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:

*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

0.05min./inch
0.05min./inch
0.068 min./inch
0.068min./inch
0.068min./inch
0.068min./inch

9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times \frac{0.194}{3.534}) \times \frac{3.25"}{0.068}$$
$$\times \ln(7.0/6.0) = \underline{24.27 \text{ in/hr}} = K-5$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator _____ Date 4/2/2010
Vincent Creevy

Signature of Professional Engineer _____ Date 4/2/2010
David A Cranmer, P.E., P.P., Lic. No.

Form 3b. Tube Permeameter Test Data: Block 122, Lot 33 Marlboro Twp.

1. Test Number Log-2 Replicate (letter) B Date Collected 4/2/2010

2. Material Tested: Test in Native Soil – Indicate Depth 43"

3. Type of Sample: Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.0"

5. Bulk Density Determination: N/A

6. Standpipe used: No Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:

*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

0.05min./inch
0.05min./inch
0.05 min./inch
0.05min./inch
0.068min./inch
0.068min./inch

9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.0" / 0.068$$
$$\times \ln(7.0/6.0) = 22.40 \text{ in/hr} = K-5$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator _____ Date 4/2/2010
Vincent Creevy

Signature of Professional Engineer _____ Date 4/2/2010
David A Cranmer, P.E., P.P., Lic. No.

Form 3b. Tube Permeameter Test Data: Block 122, Lot 33 Marlboro Twp.

1. Test Number Log-3 Replicate (letter) A Date Collected 4/2/2010

2. Material Tested: Test in Native Soil – Indicate Depth 40"

3. Type of Sample: Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.25"

5. Bulk Density Determination: N/A

6. Standpipe used: No Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:

*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

0.133min./inch
0.133min./inch
0.150 min./inch
0.167min./inch
0.167min./inch
0.167min./inch

9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.25" / 0.167$$
$$\times \ln(7.0/6.0) = 9.88 \text{ in/hr} = K-4$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator _____ Date 4/2/2010
Vincent Creevy

Signature of Professional Engineer _____ Date 4/2/2010
David A Cranmer, P.E., P.P., Lic. No.

Form 3b. Tube Permeameter Test Data: Block 122, Lot 33 Marlboro Twp.

1. Test Number Log-3 Replicate (letter) A Date Collected 4/2/2010

2. Material Tested: Test in Native Soil – Indicate Depth 40"

3. Type of Sample: Undisturbed Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in inches 1.88"
Length of Sample, L, in inches 3.0"

5. Bulk Density Determination: N/A

6. Standpipe used: No Yes
Indicate Internal Radius, 0.44"

7. Height of Water Level Above Rim of Test Basin, in inches:
At the Beginning of Each Test Interval, H₁ 7.0"
At the End of Each Test Interval, H₂ 6.0"

8. Rate of Water Level Drop:

*****STOPWATCH USED

Length of Test Interval, T in Minutes (decimal)

0.217min./inch
0.217min./inch
0.25min./inch
0.25min./inch
0.25min./inch
0.25min./inch

9. Calculation of Permeability:

$$K, (\text{in/hr}) = 60 \text{ min/hr} \times r^2/R^2 \times L(\text{in})/T(\text{min}) \times \ln(H_1/H_2)$$
$$= (60 \text{ min/hr} \times 0.194/3.534) \times 3.0" / 0.25$$
$$\times \ln(7.0/6.0) = 6.1 \text{ in/hr} = K-4$$

10. Defects in the Sample: None

11. I hereby certify that the information furnished on Form 3C of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. : 7:14-8.

Signature of Soil Evaluator _____ Date 4/2/2010
Vincent Creevy

Signature of Professional Engineer _____ Date 4/2/2010
David A Cranmer, P.E., P.P., Lic. No.