PLANNING & ZONING COMMISSION
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Sussex County
DELAWARE
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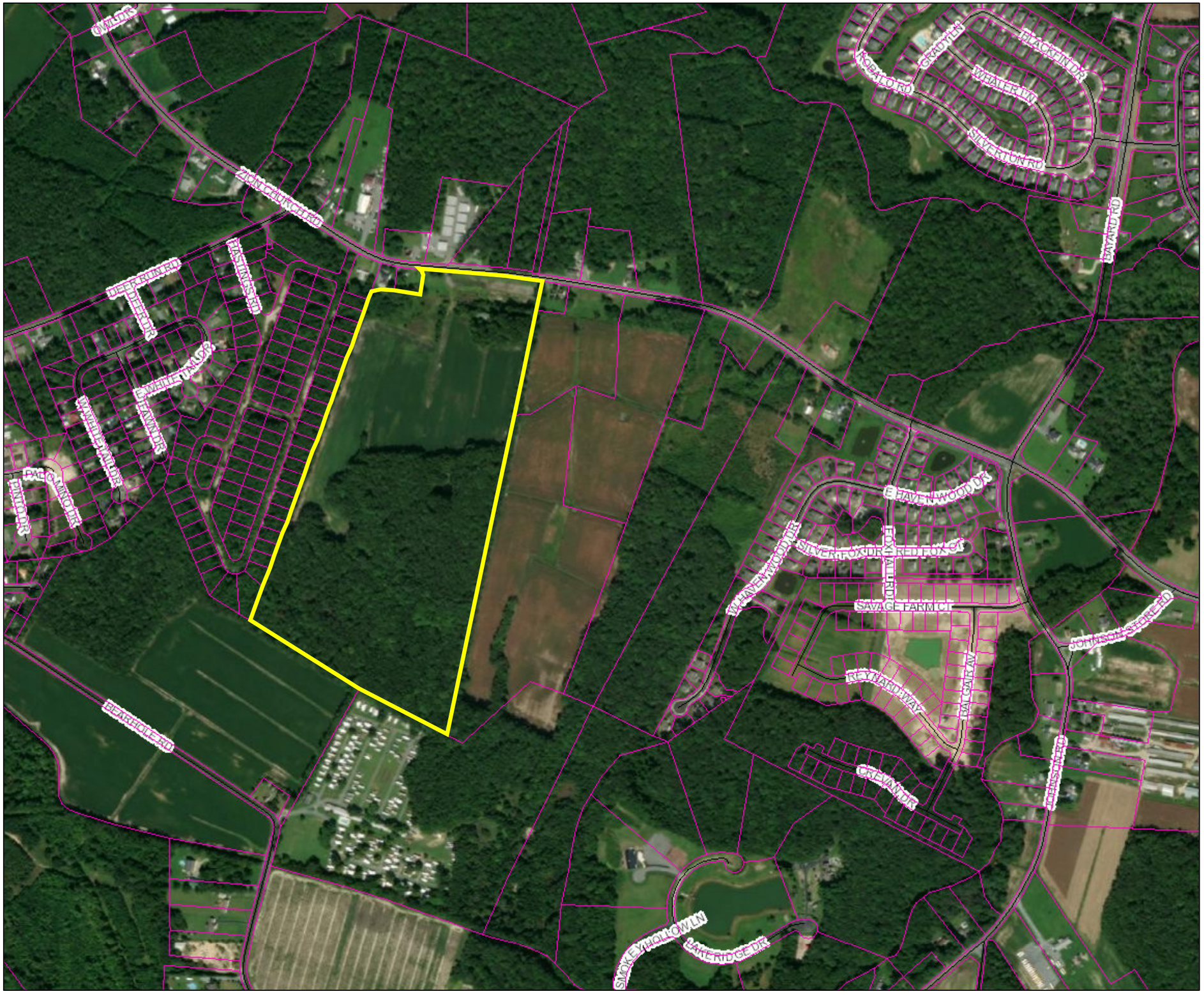
302-855-7878 T
302-854-5079 F
JAMIE WHITEHOUSE, AICP
DIRECTOR

PLANNING AND ZONING AND COUNTY COUNCIL INFORMATION SHEET
Planning Commission Public Hearing Date May 13, 2021

Application:	CZ 1942 Bay Developers, LLC (Twin Cedars, LLC)
Applicant:	Bay Developers, LLC 200 Weston Drive Dover, DE 19904
Owner:	Twin Cedars, LLC (Attention: Mr. James T. Gordon) 5427 York Lane Bethesda, MD 20814
Site Location:	The parcel is lying on the south side of Zion Church Road (Route 20), approximately 0.55-mile northwest of Bayard Road (S.C.R. 384).
Current Zoning:	Split-zoned General Commercial (C-1) Zoning District, Commercial Residential (CR-1) District & General Residential (GR) Zoning District
Proposed Zoning:	General Commercial (C-1) Zoning District & General Residential, Residential Planned Community (GR-RPC)
Proposed Use:	168 Apartments, 44 Townhomes, 42 Single-Family Detached Dwellings (254 dwelling units total)
Comprehensive Land Use Plan Reference:	Coastal Area
Councilmanic District:	Mr. Rieley
School District:	Indian River School District
Fire District:	Roxana Fire District
Sewer:	Sussex County Sewer District
Water:	Artesian
Site Area:	64.22 +/- acres
Tax Map ID.:	533-11.00-42.00

Sussex County



PIN:	533-11.00-42.00
Owner Name	TWIN CEDARS LLC
Book	3395
Mailing Address	5427 YORK LN
City	BETHESDA
State	MD
Description	S/RT 382
Description 2	750'E/RT 388
Description 3	N/A
Land Code	

polygonLayer

Override 1

polygonLayer

Override 1

Tax Parcels

Streets

County Boundaries

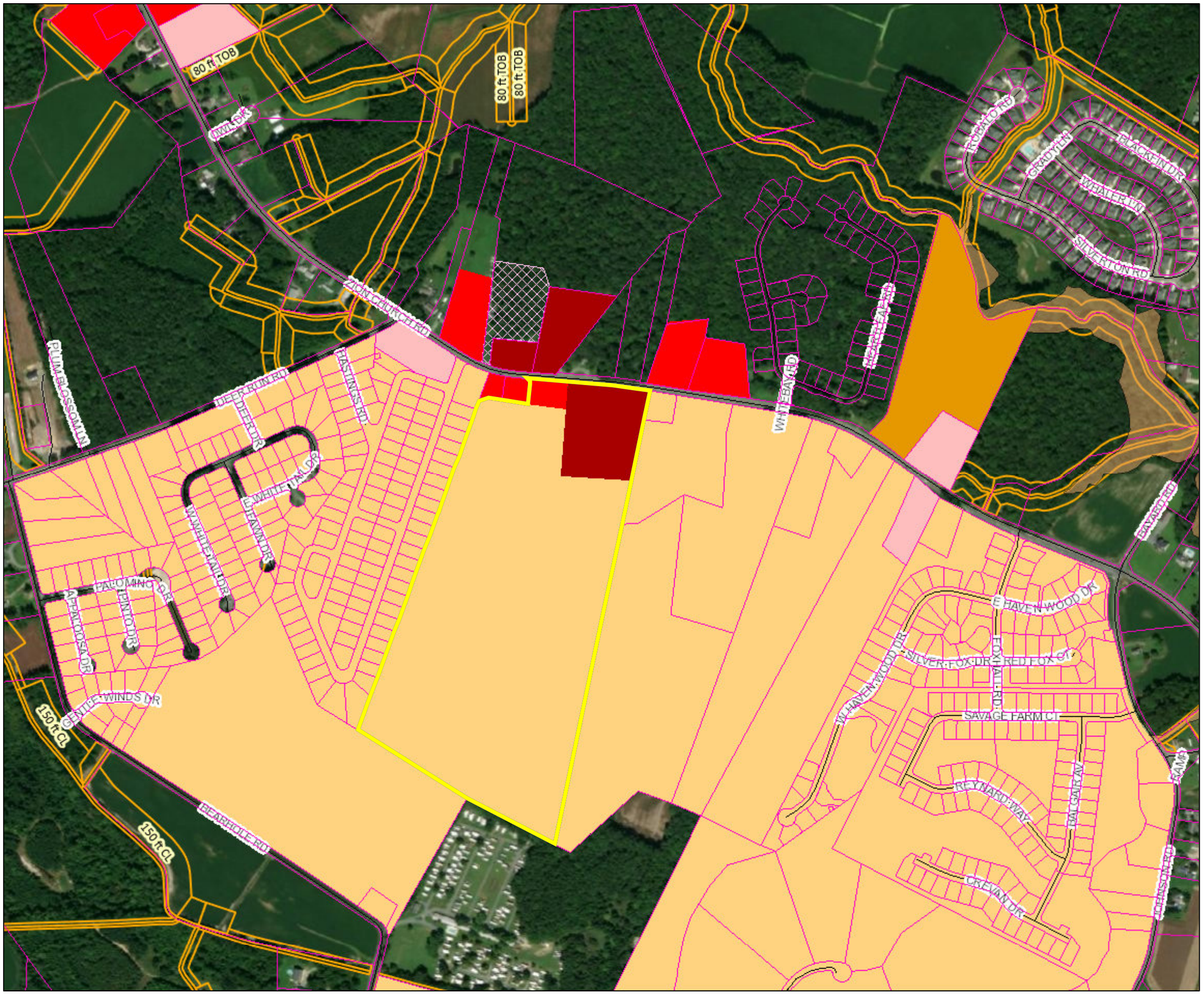
January 12, 2021

1:9,028

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

Sussex County



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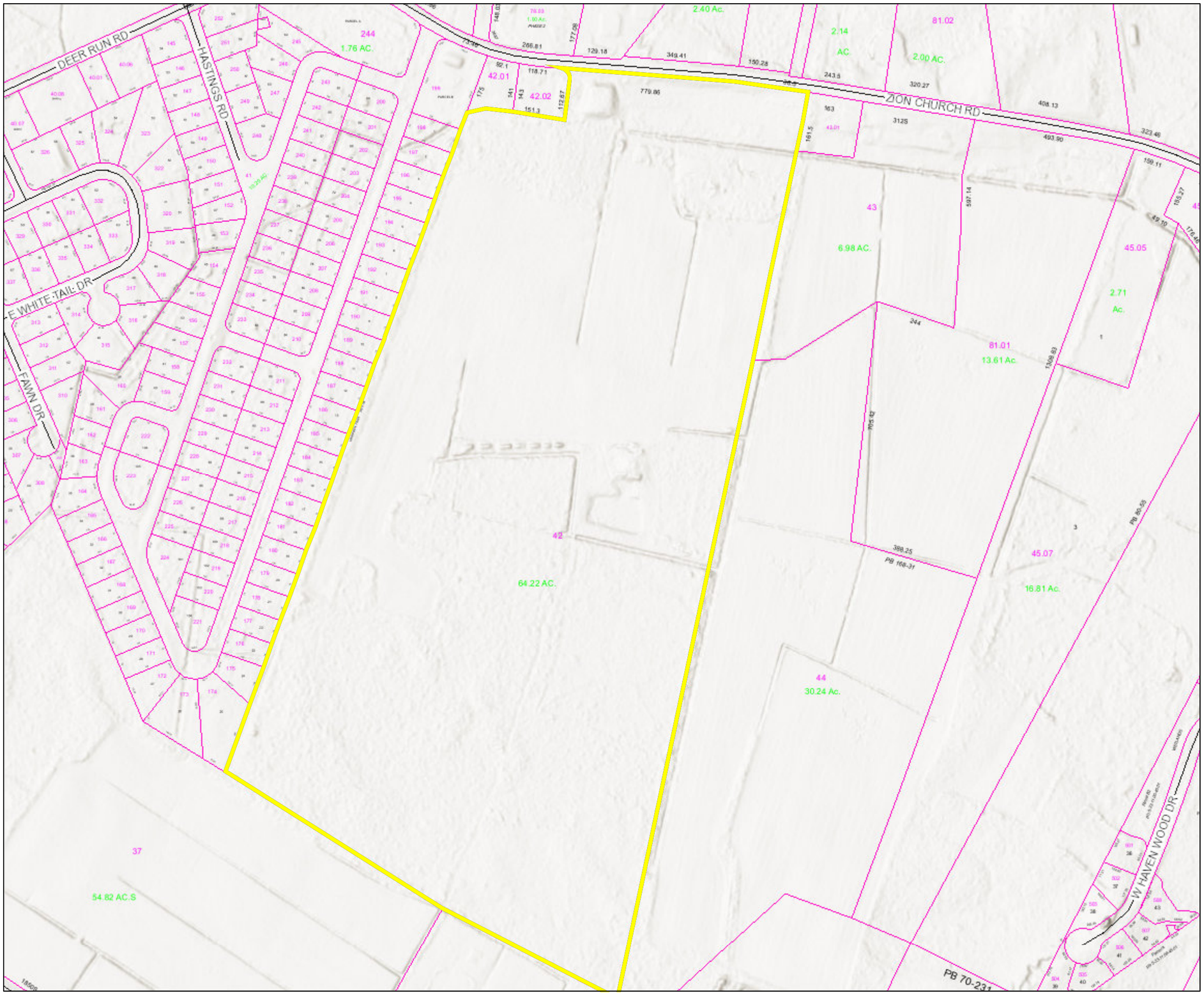
April 20, 2021

Sussex County



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Mailing Address	5427 YORK LN
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Description 2	750'E/RT 388
Description 3	N/A
Land Code	

polygonLayer

Override 1

polygonLayer

Override 1

Tax Parcels

Streets

County Boundaries

1:4,514

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

January 12, 2021

JAMIE WHITEHOUSE, AICP MRTPI
PLANNING & ZONING DIRECTOR
(302) 855-7878 T
(302) 854-5079 F
jamie.whitehouse@sussexcountyde.gov

Sussex County
DELAWARE
sussexcountyde.gov

Memorandum

To: Sussex County Planning Commission Members
From: Nick Torrance, Planner I
CC: Vince Robertson, Assistant County Attorney and applicant
Date: May 6th, 2021
RE: Staff Analysis for CZ 1942 Bay Developers, LLC (Twin Cedars, LLC)

This memo is to provide background and analysis for the Planning Commission to consider as a part of application CZ 1909 Bay Developers, LLC (Twin Cedars, LLC) to be reviewed during the May 13, 2021, Planning Commission Meeting. This analysis should be included in the record of this application and is subject to comments and information that may be presented during the public hearing.

The request is for a Change of Zone for Tax Parcel 533-11.00-42.00 to allow for a change of zone from a General Commercial (C-1) Zoning District, Commercial Residential (CR-1) Zoning District, and a General Residential (GR) Zoning District to a General Residential Zoning District, Residential Planned Community (GR-RPC). The parcel is located on the south side of Zion Church Road (Route 20), approximately 0.55-mile northwest of Bayard Road (S.C.R. 384). The parcel to be rezoned contains 64.22 acres +/-.

The 2018 Sussex County Comprehensive Plan Update (Comprehensive Plan) provides a framework of how land is to be developed. As part of the Comprehensive Plan, a Future Land Use Map is included to help determine how land should be zoned to ensure responsible development. The Future Land Use map in the plan indicates that the subject property has a land use designation of "Coastal Area." The properties to the north, south, east and west also have the land use designation of Coastal Area.

As outlined in the 2018 Sussex County Comprehensive Plan, the Coastal Areas are areas that can accommodate development provided that special environmental concerns are addressed. A range of housing types should be permitted in Coastal Areas, including single-family homes, townhouses, and multi-family units. Retail and office uses are appropriate, but larger shopping centers and office parks should be confined to selected locations with access along arterial roads. Appropriate mixed-use development should all be allowed.

The property is tri-zoned with the property being zoned General Commercial (C-1) Zoning District and Commercial Residential (CR-1) Zoning District along the road frontage of the parcel and with the remaining majority of the parcel being zoned General Residential (GR) Zoning District. The adjacent parcels to the east and west of the subject property are zoned General Residential (GR). The two properties to the north and west of the property located along Zion Church Road are zoned General Commercial (C-1). The properties to the north of the parcel on the opposite side of Zion Church Road are zoned Agricultural Residential (AR-1), Commercial Residential (CR-1) and General Commercial (C-1).

The 2018 Sussex County Comprehensive Plan outlines Zoning Districts by their applicability to each Future Land Use category. Under Table 4.5-2 "Zoning Districts Applicable to Future Land Use Categories," the General Residential (GR) Zoning District is listed as an applicable zoning district in the "Coastal Area." Although not featured within the Future Land Use Table as an applicable zoning district, the General Commercial (C-1) Zoning is a permitted zoning district within the Coastal Area as these zoning may be located within any of the land use designations.

Since 2011, there have been three (3) Change of Zone applications within a 2-mile radius of the application site. The first application is for Change of Zone No. 1715 for a change of zone from an Agricultural Residential (AR-1) Zoning District to a Commercial Residential (CR-1) Zoning District. The application was approved by the Sussex County Council on May 15, 2012 and the change was adopted through Ordinance No. 2257. The second application is for Change of Zone No. 1858 for a change of zone from an Agricultural Residential (AR-1) Zoning District to a High Density Residential, Residential Planned Community (HR-1-RPC). The application was approved by the Sussex County Council on December 11, 2018 and adopted through Ordinance No. 2621. The last application is for Change of Zone No. 1842 for a change of zone from an Agricultural Residential (AR-1) Zoning District to a Neighborhood Business (B-1) Zoning District. The application was approved by the Sussex County Council on January 30, 2018 and adopted through Ordinance No. 2545.

Based on the analysis of the land use, surrounding zoning and uses, a Change of Zone from a General Commercial (C-1) Zoning District, Commercial Residential (CR-1) Zoning District, and a General Residential (GR) Zoning District to a General Residential Zoning District, Residential Planned Community (GR-RPC) could be considered as being consistent with the land use, area zoning and surrounding uses.

File #: _____

Planning & Zoning Commission Application
Sussex County, Delaware

Sussex County Planning & Zoning Department
2 The Circle (P.O. Box 417) Georgetown, DE 19947
302-855-7878 ph. 302-854-5079 fax

Type of Application: (please check applicable)
Conditional Use ✓
Zoning Map Amendment ✓

Site Address of Conditional Use/Zoning Map Amendment

South side of Zion Church Road (Route 20/Road 382), 750' E of Deer Run Rd (Rd 388)

Type of Conditional Use Requested:

RPC

Tax Map #: 533-11.00-42.00 **Size of Parcel(s):** 64.32 ACRES

Current Zoning: C-1, CR-1, &GR **Proposed Zoning:** GR W/ RPC OVERLAY **Size of Building:** N/A

Land Use Classification: AH

Water Provider: ARTESIAN WATER **Sewer Provider:** SUSSEX COUNTY

Applicant Information

Applicant Name: BAY DEVELOPERS, LLC
Applicant Address: 200 WESTON DRIVE
City: DOVER State: DE ZipCode: 19904
Phone #: (302) 639-9707 E-mail: henry@hmastgroup.com

Owner Information

Owner Name: TWIN CEDARS, LLC (ATTN: MR. JAMES T. GORDON)
Owner Address: 5427 YORK LANE
City: BETHESDA State: MD Zip Code: 20814
Phone #: (252) 453-3650 E-mail:

Agent/Attorney/Engineer Information

Agent/Attorney/Engineer Name: Morris & Ritchie Associates, Inc (c/o Mr. Phillip L. Tolliver, P.E.)
Agent/Attorney/Engineer Address: 18 Boulden Circle, Suite 36
City: New Castle State: DE Zip Code: 19720
Phone #: (302) 326-2200 E-mail: PTolliver@mragta.com

Check List for Sussex County Planning & Zoning Applications

The following shall be submitted with the application

✓ **Completed Application**

✓ **Provide eight (8) copies of the Site Plan or Survey of the property**

- Survey shall show the location of existing or proposed building(s), building setbacks, parking area, proposed entrance location, etc.
- Provide a PDF of Plans (may be e-mailed to a staff member)
- Deed or Legal description

✓ **Provide Fee $500.00**

'WILL BE PROVIDED JNDER SEPARATE COVER, 'RIOR TO PLANNING :OMMISSION MEETING

✓ **Optional - Additional Information for the Commission/Council to consider** (ex. architectural elevations, photos, exhibit books, etc.) If provided submit 8 copies and they shall be submitted a minimum of ten (10) days prior to the Planning Commission meeting.

✓ **Please be aware that Public Notice will be sent to property owners within 200 feet of the subject site and County staff will come out to the subject site, take photos and place a sign on the site stating the date and time of the Public Hearings for the application.**

✓ **DelDOT Service Level Evaluation Request Response**

✓ **PLUS Response Letter** (if required)

The undersigned hereby certifies that the forms, exhibits, and statements contained in any papers or plans submitted as a part of this application are true and correct.

I also certify that I or an agent on by behalf shall attend all public hearing before the Planning and Zoning Commission and the Sussex County Council and any other hearing necessary for this application and that I will answer any questions to the best of my ability to respond to the present and future needs, the health, safety, morals, convenience, order, prosperity, and general welfare of the inhabitants of Sussex County, Delaware.

PHILLIP LEE THOMAS REGISTERED No. 12480 PROFESSIONAL ENGINEER

Signature of Applicant/Agent/Attorney

_____ Date: 3/12/21

Signature of Owner

_____ Date: 3/12/2021

For office use only:

Date Submitted: _____ Fee: $500.00 Check #: _____

Staff accepting application: _____ Application & Case #: _____

Location of property: _____

_____

Subdivision: _____

Date of PC Hearing: _____ Recommendation of PC Commission: _____

Date of CC Hearing: _____ Decision of CC: _____

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

July 13, 2020

Mr. Joe Caloggero
The Traffic Group, Inc.
9900 Franklin Square Drive
Suite H
Baltimore, MD 21236

Dear Mr. Caloggero:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Twin Cedars** (Protocol Tax Parcel 533-11.00-42.00) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel
Project Engineer

TEB:km
Enclosures
cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Jamie Whitehouse, Sussex County Planning and Zoning
Mr. Andrew Parker, McCormick Taylor, Inc.
Mr. Kevin Hickman, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Brad Eaby, Deputy Attorney General
J. Marc Coté, Director, Planning
Shanté Hastings, Director, Transportation Solutions (DOTS)
Mark Luszcz, Deputy Director, DOTS
Michael Simmons, Assistant Director, Project Development South, DOTS
Todd Sammons, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Chris Sylvester, Traffic Studies Manager, Traffic, DOTS
Alistair Probert, South District Engineer, South District
Gemez Norwood, South District Public Works Supervisor, South District
Jared Kaufmann, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Susanne Laws, Sussex Review Coordinator, Development Coordination
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
James Argo, Sussex Plan Reviewer, South District
Mark Galipo, Traffic Engineer, Traffic, DOTS
Claudy Joinville, Project Engineer, Development Coordination

McCORMICK TAYLOR

July 10, 2020

Mr. Troy E. Brestel
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1946F
Traffic Impact Study Services
Task No. 1A Subtask 01A – Twin Cedars

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Twin Cedars residential development prepared by The Traffic Group, Inc. dated March 9, 2020. The Traffic Group prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Twin Cedars residential development, proposed to be located along Delaware Route 20 (Zion Church Road / Sussex Road 382) between Deer Run Road (Sussex Road 388) and Bayard Road (Sussex Road 384) / Johnson Road (Sussex Road 382A) in Sussex County, Delaware. The proposed development would consist of 44 single-family detached houses, 44 townhouses, and 168 apartments. One full-access driveway is proposed on Delaware Route 20. Construction is expected to be complete by 2026.

The subject land is located on an approximately 64.22-acre parcel. The land is currently split zoned as C-1 (General Commercial) and GR (General Residential), and the developer is seeking a residential planned community (RPC) overlay for the GR portion in Sussex County.

Currently, there is one active DelDOT project within the study area. The project involves planned improvements at the intersection of Delaware Route 20 and Bayard Road/Johnson Road. In late 2018 and early 2019, DelDOT's Traffic Studies Section conducted a traffic study and solicited public input to evaluate possible safety improvements at this unsignalized two-way stop-controlled intersection. Through this process, DelDOT determined that a traffic signal is recommended for this intersection. This recommendation and the associated documentation has been sent to DelDOT's Traffic Design Section to start programming the design work. The construction date is to be determined.

Based on our review, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	*Existing Traffic Control*	*Situations for which deficiencies occur*
Delaware 20 and Bayard Road / Johnson Road	Unsignalized	2019 Existing summer Saturday (Case 1); 2026 without Twin Cedars summer Saturday (Case 2); 2026 with Twin Cedars summer Saturday (Case 3)

Delaware Route 20 and Bayard Road / Johnson Road

This unsignalized intersection experiences LOS deficiencies in the Saturday midday peak hour for 2019 existing conditions, 2026 conditions without Twin Cedars, and 2026 conditions with Twin Cedars. DelDOT has evaluated various improvement options for this intersection and determined that a traffic signal is recommended; to this end, the developer should make an equitable share contribution toward the installation of a traffic signal, as described below in Item No. 2.

Should the County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should construct the full-movement site access on Delaware Route 20. The proposed configuration is shown in the table below. This proposed site driveway should be constructed directly across from the existing Bayside Mini Storage driveway.

Approach	Existing Configuration	Proposed Configuration
Eastbound Delaware Route 20	One shared left-turn/through lane	One left-turn lane, one through lane, and one right-turn lane
Westbound Delaware Route 20	One shared through/right-turn lane	One left-turn lane and one shared through/right-turn lane
Northbound Site Access	Approach does not exist	One shared left-turn/through lane and one right-turn lane
Southbound Bayside Mini Storage driveway	One shared left/right-turn lane	One shared left/through/right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Delaware Route 20	50 feet *	290 feet **
Westbound Delaware Route 20	210 feet **	N/A
Northbound Site Access	N/A	50 feet ***
Southbound Bayside Mini Storage driveway	N/A	N/A

* Turn lane is not warranted per DelDOT's *Auxiliary Lane Worksheet,* but is recommended for safety to shadow the required westbound left-turn lane.
** Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*.
*** Initial turn-lane length based on storage length per queuing analysis, with 50-foot minimum

2. The developer should coordinate with DelDOT regarding an equitable share contribution toward a DelDOT project to install a traffic signal at the intersection of Delaware Route 20 and Bayard Road / Johnson Road. The amount of the contribution should be determined through coordination with DelDOT's Development Coordination Section. At least one other developer is required to contribute to this improvement as well.

3. The following bicycle and pedestrian improvements should be included:

   a. Adjacent to the proposed right-turn lane on eastbound Delaware Route 20 at the proposed site entrance, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel

   b. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.

   c. Utility covers should be made flush with the pavement.

   d. If clubhouses or other community facilities are constructed as shown on the site plan, bicycle parking should be provided near building entrances. Where building architecture provides for an awning, other overhang, or indoor parking, the bicycle parking should be covered.

   e. A minimum 15-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Delaware Route 20.

f. Within the easement along the Delaware Route 20 site frontage, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed. The shared-use path should meet AASHTO and ADA standards and should have a minimum of a five-foot buffer from the roadway. At the property boundaries, the shared-use path should connect to the adjacent property or to the shoulder in accordance with DelDOT's *Shared-Use Path and/or Sidewalk Termination Reference Guide* dated August 1, 2018. The developer should coordinate with DelDOT's Development Coordination Section to determine the details of the shared-use path connections at the property boundaries.

g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.

h. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. Internal sidewalks in the development should connect to the proposed shared-use path along Delaware Route 20.

i. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's site plan review process.

Additional details on our review of this TIS are attached. Please contact me at (610) 640-3500 or through e-mail at ajparker@mccormicktaylor.com if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.

Andrew J. Parker, PE, PTOE
Project Manager

Enclosure

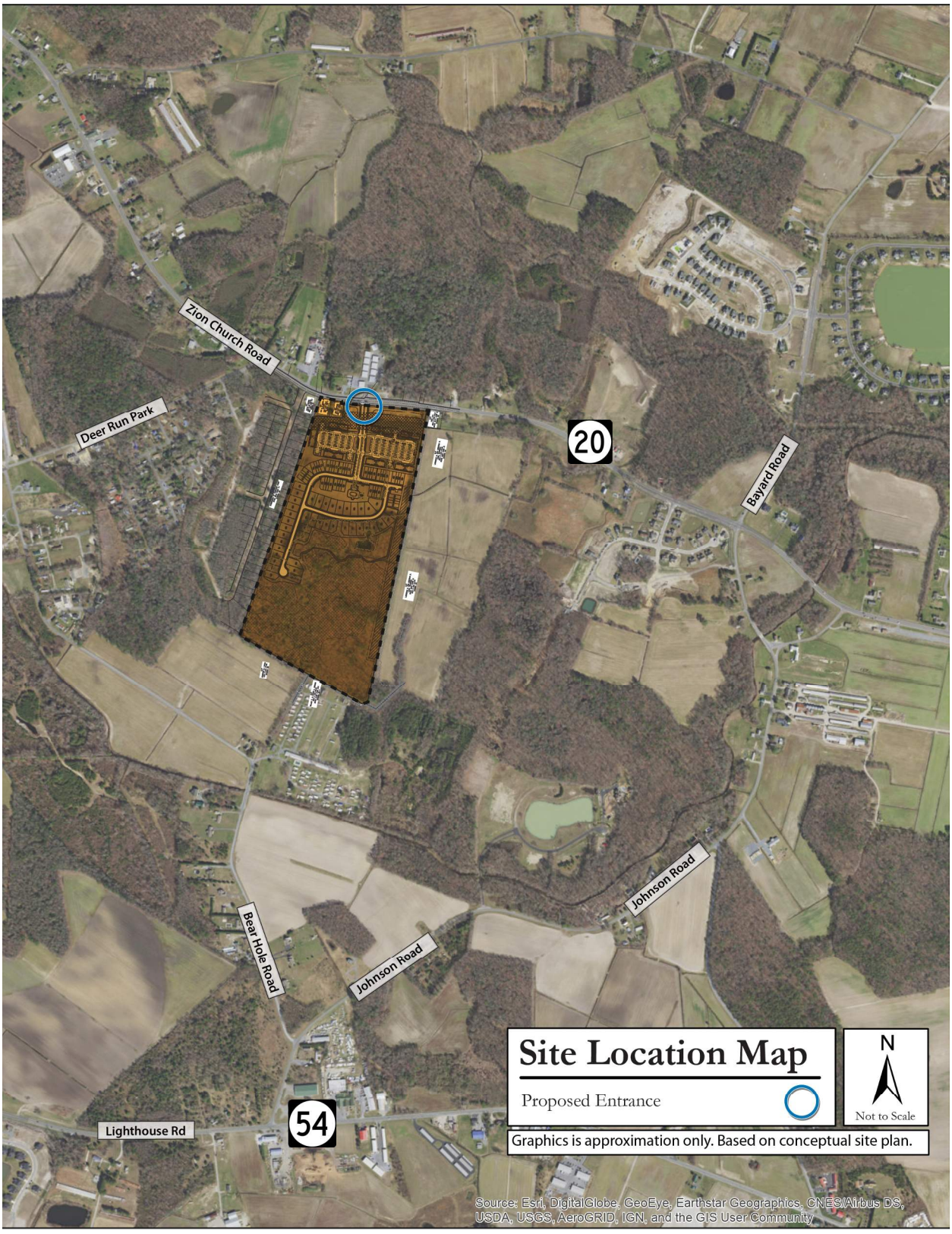
General Information

Report date: March 9, 2020
Prepared by: The Traffic Group, Inc.
Prepared for: Bay Developers, LLC
Tax parcel: 533-11.00-42.00
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Twin Cedars development consists of 44 single-family detached houses, 44 townhouses, and 168 apartments.
Location: The site is located along Delaware Route 20 (Zion Church Road / Sussex Road 382) between Deer Run Road (Sussex Road 388) and Bayard Road (Sussex Road 384) / Johnson Road (Sussex Road 382A) in unincorporated Sussex County. A site location map is included on page 6.
Amount of land to be developed: approximately 64.22 acre parcel
Land use approval(s) needed: Subdivision approval. The land is currently split zoned as C-1 (General Commercial) and GR (General Residential), and the developer is seeking a residential planned community (RPC) overlay for the GR portion in Sussex County.
Proposed completion year: 2026
Proposed access locations: One full-access driveway is proposed on Delaware Route 20.
Daily Traffic Volumes (per DelDOT Traffic Summary 2019):

- 2019 Average Annual Daily Traffic on Delaware Route 20: 6,635 vehicles/day


Zion Church Road
Deer Run Park
20
Bayard Road
Johnson Road
Bear Hole Road
Johnson Road
Lighthouse Rd
54
Site Location Map
Proposed Entrance
N
Not to Scale
Graphics is approximation only. Based on conceptual site plan.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2015 Delaware Strategies for State Policies and Spending

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed Twin Cedars residential development is located within Investment Level 3.

Investment Level 3
Investment Level 3 reflects areas where growth is anticipated by local, county, and state plans in the longer-term future. Investment Level 3 areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities, but where development is not necessary to accommodate expected short-term population growth. The second category includes lands that are adjacent to fast-growing Investment Level 1 and 2 areas but are often impacted by environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state Agencies and local governments with land-use authority.

Generally, Investment Level 3 areas should not be developed until surrounding Investment Level 1 and 2 areas are substantially built out. From a housing perspective, Investment Level 3 areas are characterized by low density and rural homes. New housing developments in the short term would, in most cases, represent leap-frog development, which is undesirable. Higher density housing in Investment Level 3 areas is more appropriate once Level 2 areas are built out and utilities are available.

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed Twin Cedars residential development includes 44 single-family detached houses, 44 townhouses, and 168 apartments located within an Investment Level 3 area. Investment Level 3 reflects areas where growth is anticipated by the county in the long-term. Given that the location is in a Growth Area as defined by Sussex County and that the anticipated opening date for this development is three years out, the proposed development generally appears to comply with the guidelines of Investment Level 3 areas as described in the 2015 "Strategies for State Policies and Spending."

Comprehensive Plan

Sussex County Comprehensive Plan:
(Source: Sussex County Comprehensive Plan, March 2019)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development parcel is within a Coastal Area (categorized as a Growth Area).

Growth Areas, including the Coastal Area, are designed to accommodate concentrated levels of development. Sussex County has designated the areas around Rehoboth Bay, Indian River Bay, and Little Assawoman Bay (the inland bays) as Coastal Areas. Coastal Areas generally encompass areas on the south-eastern side of Sussex County within what was previously referred to as the Environmentally Sensitive Developing Areas of prior Comprehensive Plans. The updated name more accurately reflects the function of this land use classification. While the Coastal Area is a

Growth Area, additional considerations should be taken into account in this Area that may not apply in other Growth Areas.

The Coastal Area designation is intended to recognize two characteristics. First, this region is among the most desirable locations in Sussex County for new housing, as is reflected in new construction data and real estate prices. Second, this region contains ecologically important and sensitive characteristics as well as other coastal lands which help to absorb floodwaters and provide extensive habitat for native flora and fauna. This area also has significant impact upon water quality within the adjacent bays and inlets as well as upon natural the region's various habitats. And, these factors are themselves part of the reason that this Area is so desirable-making the protection of them important to both the environment and the economy.

The County has significant initiatives to extend public sewer service to replace inadequate on-site systems. Careful control of stormwater runoff is also an important concern in keeping sediment and other pollutants out of the Inland Bays.

The challenge in this region is to safeguard genuine natural areas and mitigate roadway congestion without stifling the tourism and real estate markets which: a) provide many jobs; b) create business for local entrepreneurs; and c) help keep local tax rates low.

The following guidelines should apply to future growth in Coastal Areas:

Permitted Uses – Coastal Areas are areas that can accommodate development provided special environmental concerns are addressed. A range of housing types should be permitted in Coastal Areas, including single-family homes, townhouses, and multi-family units. Retail and office uses are appropriate but larger shopping centers and office parks should be confined to selected locations with access along arterial roads. Appropriate mixed-use development should also be allowed. In doing so, careful mixtures of homes with light commercial, office and institutional uses can be appropriate to provide for convenient services and to allow people to work close to home. Major new industrial uses are not proposed in these areas.

Densities – Sussex County's base density of 2 units per acre is appropriate throughout this classification; however, medium and higher density (4-12 units per acre) can be appropriate in certain locations. Medium and higher density could be supported in areas: where there is central water and sewer; near sufficient commercial uses and employment centers; where it is in keeping with the character of the area; where it is along a main road or at/or near a major intersection; where there is adequate Level of Service; or where other considerations exist that are relevant to the requested project and density. A clustering option permitting smaller lots and additional flexibility in dimensional standards is encouraged on tracts of a certain minimum size, provided significant permanent common open space is preserved and the development is connected to central water and sewer service. The preservation of natural resources or open space is strongly encouraged in this land use classification. The County should revisit environmental protection in the Coastal Areas.

Specific regulations governing cluster developments are designated by zoning district. There currently is an option where density can be increased with optional density bonuses for certain

zoning districts. Those optional bonuses may involve payment of fees that fund permanent land preservation elsewhere in the County, or other options. RPC's are encouraged to allow for a mix of housing types and to preserve open space and natural areas/resources. Cluster development that allows for smaller lots and flexibility in dimensional standards is encouraged if the developer uses a cluster option that results in permanent preservation of a substantial percentage of the tract and/or natural areas/resources. Master planning should be encouraged especially for large-scale developments on large parcels or groups of parcels, higher density and mixed-use developments to provide flexibility in site design.

All applicants for developments of a minimum size (as specified in zoning) should continue to be required to provide information that analyzes the development's potential environmental impacts, including effects on stormwater runoff, nitrogen and phosphorous loading, wetlands, woodlands, wastewater treatment, water systems, and other matters that affect the ecological sensitivity of the inland bays.

Infrastructure – Central water and sewer facilities are strongly encouraged. If central utilities are not possible, permitted densities should be limited to two units per acre provided a septic permit can be approved.

Proposed Development's Compatibility with Comprehensive Plan: The proposed Twin Cedars residential development includes 44 single-family detached houses, 44 townhouses, and 168 apartments on a 64.22-acre parcel (a gross density of just under 4 units per acre). The land is currently split zoned as C-1 (General Commercial) and GR (General Residential), and the developer is seeking a residential planned community (RPC) overlay for the GR portion in Sussex County. The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development parcel is within the Coastal Area (categorized as a Growth Area). The proposed development appears to comply with the characteristics and *Permitted Uses* for the Coastal Area. However, due to the some small lot sizes and overall density greater than 2 units per acre, along with the potential RPC overlay, this development raises questions regarding consistency with Sussex County regulations; therefore additional discussion may be required.

Relevant Projects in the DelDOT Capital Transportation Program

Currently, there is one active DelDOT project within the study area. The project involves planned improvements at the intersection of Delaware Route 20 and Bayard Road/Johnson Road. In late 2018 and early 2019, DelDOT's Traffic Studies Section conducted a traffic study and solicited public input to evaluate possible safety improvements at this unsignalized two-way stop-controlled intersection. Through this process, DelDOT determined that a traffic signal is recommended for this intersection. This recommendation and the associated documentation has been sent to DelDOT's Traffic Design Section to start programming the design work. The construction date is to be determined.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Tenth Edition, published by the Institute of Transportation Engineers (ITE). The following land use was utilized to estimate the amount of new traffic generated for this development:

- 44 Single-Family Detached Homes (ITE Land Use Code 210)
- 44 Multi-Family Housing Units, Low-Rise (ITE Land Use Code 220)
- 168 Multi-Family Housing Units, Mid-Rise (ITE Land Use Code 221)

Table 1
TWIN CEDARS PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
44 Single-Family Detached	9	27	36	29	17	46	30	25	55
44 Multi-Family Housing, Low-Rise	5	17	22	18	10	28	8	6	14
168 Multi-Family Housing, Mid-Rise	15	42	57	45	28	73	38	39	77
TOTAL TRIPS	29	86	115	92	55	147	76	70	146

Overview of TIS

Intersections examined:

1) Delaware Route 20 & Site Access
2) Delaware Route 20 & Deer Run Road
3) Delaware Route 20 & Bayard Road / Johnson Road

Conditions examined:

1) 2019 existing (Case 1)
2) 2026 without Twin Cedars (Case 2)
3) 2026 with Twin Cedars (Case 3)

Peak hours evaluated: Weekday morning and evening and Saturday mid-day peak hours

Committed developments considered:

1) Orr Property (a.k.a. Miller Creek) (135 single-family detached houses)
2) Estuary (284 single-family detached houses)
3) Fox Haven I (76 single-family detached houses; 4 unbuilt)
4) Fox Haven II (99 single-family detached houses)

Intersection Descriptions

1) **Delaware Route 20 & Site Access**
   Type of Control: proposed one-way stop (T-intersection)
   Eastbound Approach: (Delaware Route 20) existing one through lane; proposed one through lane and one right-turn lane
   Westbound Approach: (Delaware Route 20) existing one through lane; proposed one left-turn lane and one through lane
   Northbound Approach: (Site Access) proposed one shared left-turn/right-turn lane, stop control

2) **Delaware Route 20 & Deer Run Road**
   Type of Control: unsignalized
   Eastbound Approach: (Delaware Route 20) one shared through/right-turn lane
   Westbound Approach: (Delaware Route 20) one left-turn/through lane
   Northbound Approach: (Deer Run Road) one shared left-turn/right-turn lane, stop control

3) **Delaware Route 20 & Bayard Road / Johnson Road**
   Type of Control: existing two-way stop; DelDOT traffic study proposes a traffic signal
   Eastbound Approach: (Delaware Route 20) one left-turn lane, one through lane, one bicycle lane, and one right-turn lane
   Westbound Approach: (Delaware Route 20) one shared left-turn/through/right-turn lane
   Northbound Approach: (Johnson Road) one shared left-turn/through/right-turn lane, stop control
   Southbound Approach: (Bayard Road) one shared left-turn/through/right-turn lane, stop control

Safety Evaluation

Crash Data: Per current DelDOT policy, review of crash data was not conducted at this time.

Sight Distance: The proposed site access on Delaware Route 20 is located between two horizontal curves, so sight distance is limited looking in either direction (especially to the left) from the proposed northbound driveway approach. As always adequacy of available sight distance should be confirmed during the site plan review process for all proposed movements at the site accesses.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) does not currently operate any fixed-route transit bus service in the area of the proposed Twin Cedars residential development.

Planned transit service: The TIS provided documentation of correspondence with a DTC representative who stated that no transit amenities are needed at this time. DTC has no plans to provide transit service to the area in the near future.

Existing bicycle and pedestrian facilities: The following study area roadways are identified as "Bicycling Routes" on the *Sussex County Bicycle Map* published by DelDOT:

- Delaware Route 20:
  - Regional Bicycle Route with bikeway
  - Over 5,000 vehicles daily
- Bayard Road: Connector bicycle route without bikeway
- Johnson Road: Connector bicycle route without bikeway

There are no existing sidewalks or exclusive pedestrian facilities in the immediate area of the proposed site entrance on Delaware Route 20. There are however new pedestrian facilities and bike lanes at the Delaware Route 20 & Bayard / Johnson Road intersection in the eastbound direction.

Planned bicycle and pedestrian facilities: The TIS provided documentation of correspondence with a representative from DelDOT's Local Systems Planning Section who was contacted to determine requested accommodations for bicycles and pedestrians. It is requested that a 10-foot-wide Multi-Use Pathway would be needed across the frontage.

Previous Comments

In a review letter dated February 5, 2020, DelDOT indicated that the revised Preliminary TIS was acceptable as submitted.

It appears that all substantive comments from DelDOT's TIS Scoping Memorandum, Traffic Count Review, Preliminary TIS Review, and other correspondence were addressed in the Final TIS submission.

General HCS Analysis Comments

(see table footnotes on the following pages for specific comments)

1) Both The Traffic Group, Inc. and McCormick Taylor utilized Highway Capacity Software (HCS) version 7.8 to complete the traffic analyses.

2) As per HCM methodologies, The Traffic Group and McCormick Taylor applied percent heavy vehicles (HV) by lane at all-way stop control intersections. In general, existing HV were applied to future conditions as well. For new intersections, 3% was assumed as per the DelDOT Development Coordination Manual section 2.2.8.11.6.H.

3) For existing conditions, the TIS and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F.

Table 2
Peak Hour Levels of Service (LOS)
Based on Twin Cedars Traffic Impact Study – March 2020
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [1] **One-Way Stop (T-Intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 20 & **Site Access**	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2026 with Twin Cedars (Case 3)						
Westbound DE 20 – Left	A (7.9)	A (8.3)	A (8.6)	A (7.9)	A (8.3)	A (8.6)
Northbound Site Access	B (12.9)	B (14.1)	C (19.8)	B (12.9)	B (14.1)	C (19.8)

[1] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 3
Peak Hour Levels of Service (LOS)
Based on Twin Cedars Traffic Impact Study – March 2020
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [2] **One-Way Stop (T-Intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 20 & **Deer Run Road**	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2019 Existing (Case 1)						
Westbound DE 20 – Left	A (7.8)	A (7.9)	A (8.2)	A (7.8)	A (7.9)	A (8.2)
Northbound Deer Run Road	B (10.8)	B (10.8)	B (12.5)	B (10.8)	B (10.8)	B (12.5)
2026 without Twin Cedars (Case 2)						
Westbound DE 20 – Left	A (7.9)	A (8.0)	A (8.3)	A (7.9)	A (8.0)	A (8.3)
Northbound Deer Run Road	B (11.3)	B (11.2)	B (13.0)	B (11.3)	B (11.2)	B (13.0)
2026 with Twin Cedars (Case 3)						
Westbound DE 20 – Left	A (7.9)	A (8.1)	A (8.4)	A (7.9)	A (8.1)	A (8.4)
Northbound Deer Run Road	B (11.6)	B (11.6)	B (13.4)	B (11.6)	B (11.6)	B (13.4)

[2] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 4
Peak Hour Levels of Service (LOS)
Based on Twin Cedars Traffic Impact Study – March 2020
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [3] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 20 & Bayard Road / Johnson Road	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2019 Existing (Case 1)						
Eastbound DE 20 – Left	A (7.8)	A (8.0)	A (8.6)	A (7.8)	A (8.0)	A (8.6)
Westbound DE 20 – Left	A (7.7)	A (7.8)	A (8.1)	A (7.7)	A (7.8)	A (8.1)
Northbound Johnson Road	B (14.9)	C (16.6)	D (30.3)	B (14.9)	C (16.7)	D (30.6)
Southbound Bayard Road	C (17.1)	C (18.3)	F (70.9)	C (17.6)	C (18.9)	F (82.6)
2026 without Twin Cedars (Case 2)						
Eastbound DE 20 – Left	A (7.9)	A (8.1)	A (8.8)	A (7.9)	A (8.1)	A (8.8)
Westbound DE 20 – Left	A (7.7)	A (7.8)	A (8.2)	A (7.7)	A (7.8)	A (8.2)
Northbound Johnson Road	C (16.4)	C (19.8)	E (47.2)	C (16.5)	C (19.9)	E (49.1)
Southbound Bayard Road	C (21.2)	C (24.1)	F (206.3)	C (22.1)	D (25.4)	F (238.9)
2026 with Twin Cedars (Case 3)						
Eastbound DE 20 – Left	A (8.0)	A (8.2)	A (8.9)	A (8.0)	A (8.2)	A (8.9)
Westbound DE 20 – Left	A (7.8)	A (7.9)	A (8.2)	A (7.8)	A (7.9)	A (8.2)
Northbound Johnson Road	C (18.6)	C (23.5)	F (76.2)	C (18.6)	C (23.6)	F (86.1)
Southbound Bayard Road	D (25.5)	D (29.1)	F (310.7)	D (27.5)	D (31.1)	F (354.3)

[3] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

SUSSEX COUNTY ENGINEERING DEPARTMENT
UTILITY PLANNING & DESIGN REVIEW DIVISION
C/U & C/Z COMMENTS

RECEIVED
MAY 06 2021
SUSSEX COUNTY
PLANNING & ZONING

TO: **Jamie Whitehouse**

REVIEWER: **Chris Calio**

DATE: **5/5/2021**

APPLICATION: **CZ 1942 Bay Developers, LLC (Twin Cedars, LLC)**

APPLICANT: **Bay Developers, LLC**

FILE NO: **JCS-5.06**

TAX MAP & PARCEL(S): **533-11.00-42.00**

LOCATION: **Located on the south side of Zion Church Road (Rt. 20), approximately 0.55 mile northwest of Bayard Rd. (SCR 384)**

NO. OF UNITS: **254 total**

GROSS ACREAGE: **64.22**

SYSTEM DESIGN ASSUMPTION, MAXIMUM NO. OF UNITS/ACRE: **4**

SEWER:

(1). Is the project in a County operated and maintained sanitary sewer and/or water district?

Yes ☒ No ☐

a. If yes, see question (2).
b. If no, see question (7).

(2). Which County Tier Area is project in? **Tier 1**

(3). Is wastewater capacity available for the project? **Yes** If not, what capacity is available? **N/A**.

(4). Is a Construction Agreement required? **Yes** If yes, contact Utility Engineering at (302) 855-7717.

(5). Are there any System Connection Charge (SCC) credits for the project? **No** If yes, how many? **N/A**. Is it likely that additional SCCs will be required? **Yes** If yes, the current System Connection Charge Rate is **Unified $6,360.00** per EDU. Please contact **Noell Warren** at **302-855-7719** for additional information on charges.

(6). Is the project capable of being annexed into a Sussex County sanitary sewer district? **N/A**

☐ Attached is a copy of the Policy for Extending District Boundaries in a Sussex County Water and/or Sanitary Sewer District.

(7). Is project adjacent to the Unified Sewer District? **N/A**

(8). Comments: **Click or tap here to enter text.**

(9). Is a Sewer System Concept Evaluation required? **Already Completed, See Attached**

(10). Is a Use of Existing Infrastructure Agreement Required? **Yes**

UTILITY PLANNING APPROVAL:

John J. Ashman
Director of Utility Planning

Xc: Hans M. Medlarz, P.E.
Lisa Walls
Noell Warren

ENGINEERING DEPARTMENT

ADMINISTRATION	(302) 855-7718
AIRPORT & INDUSTRIAL PARK	(302) 855-7774
ENVIRONMENTAL SERVICES	(302) 855-7730
PUBLIC WORKS	(302) 855-7703
RECORDS MANAGEMENT	(302) 854-5033
UTILITY ENGINEERING	(302) 855-7717
UTILITY PERMITS	(302) 855-7719
UTILITY PLANNING	(302) 855-1299
FAX	(302) 855-7799

Sussex County
DELAWARE
sussexcountyde.gov

HANS M. MEDLARZ, P.E.
COUNTY ENGINEER

JOHN J. ASHMAN
DIRECTOR OF UTILITY PLANNING

SEWER SERVICE CONCEPT EVALUATION (SSCE)

UTILITY PLANNING DIVISION

Applicant: Morris & Ritchie Associates, Inc.

Date: 9/23/2019

Reviewed by: **Chris Calio**

Agreement #:**943-1**

Project Name: **Twin Cedars**

Tax Map & Parcel(s): **533-11.00-42.00**

Sewer Tier: Tier 1 - Sussex County Unified Sanitary Sewer District

Proposed EDUs: **258**

Pump Station(s) Impacted: **PS 305 & PS 30**

List of parcels to be served, created from the base parcel: **N/A.**

List of additional parcels to be served (Parcels required for continuity must be served with infrastructure): **533-11.00-44.00**

Connection Point(s): **Manhole JC-111 or JC-110**

Use of Existing Infrastructure Agreement required? Yes ☒ or No ☐

Annexation Required? Yes ☐ or No ☒

Easements Required? Yes ☒ or No ☐

Fee for annexation (based on acreage):**N/A**

Current Zoning: **C-1 & GR** Zoning Proposed: **C-1 & GR w/ RPC overlay**

Acreage: **64.22**

Additional Information: Click or tap here to enter text.

* No capacity is guaranteed until System Connection Fees are paid

All gravity sewers with three (3) or more minor branches shall be designed at minimum slope and maximum depth.

Once Construction Drawings are completed with all of the above information satisfied, please submit to:

Sussex County Public Works Department
2 The Circle
P.O. Box 589
Georgetown DE 19947

CC: John Ashman
Jayne Dickerson
Michael Brady
Noell Warren

Nick Torrance

From: Karen Simpson <kslsimpson@gmail.com>
Sent: Thursday, May 6, 2021 10:05 AM
To: Planning and Zoning
Subject: Fwd: Case #C/Z1909 Bay Developers, LLC (Twin Cedars, LLC)

Categories: Nick

Members of Sussex County Planning and Zoning & Council,

In Reference to Case #C/Z 1909 Bay Developers, LLC (Twin Cedars, LLC):

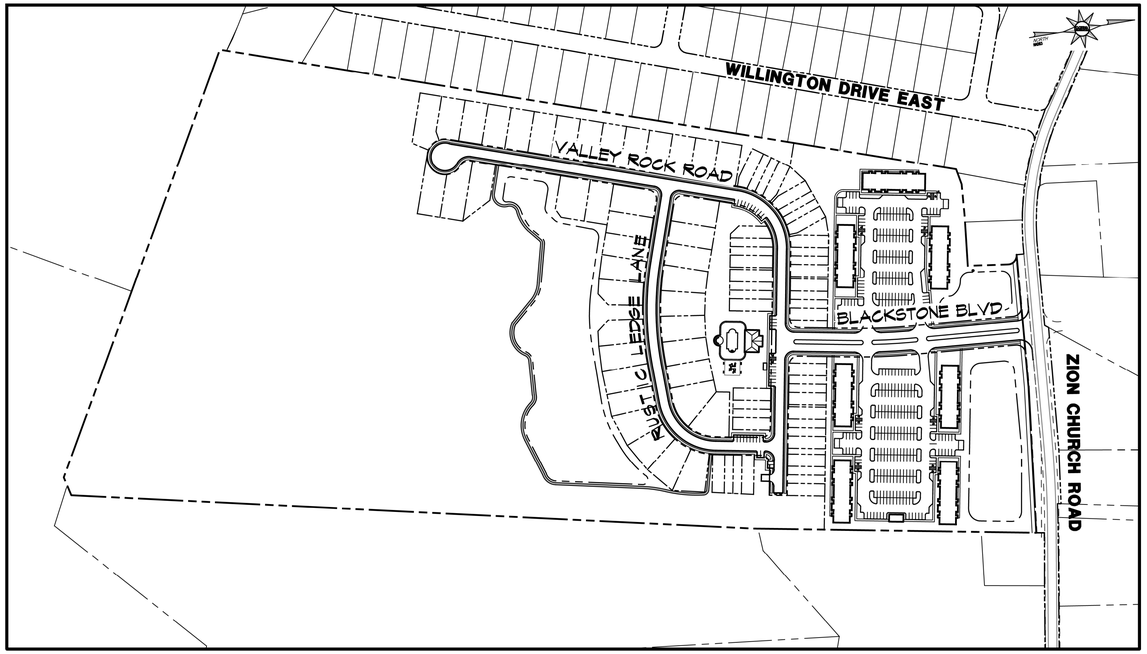
We request the developer/property owner notify any potential lot buyers at the time of sale, that the adjoining property, in part, is a campground. In addition, hunting and/or target shooting may take place in the off-season.

Thank you,

William D. and Karen L. Simpson
37421 Bearhole Road
Selbyville, DE 19975
302-242-8912

TWIN CEDARS

SUSSEX COUNTY, DELAWARE
PRELIMINARY PLANS
SUSSEX COUNTY PLANNING # XXXX
GR - RPC

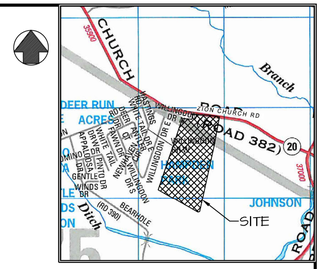


SITE OVERVIEW
SCALE: 1" = 200'

SCALE: 1" = 200'

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED R/W LINE
- PROPOSED LOT LINE
- PROPOSED BUILDING SETBACK LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED LOT NUMBER
- EXISTING WOODLANDS LINE
- WOODLAND PRESERVATION LINE



LOCATION MAP
SCALE: 1" = 2000'

PROJECT TEAM

DEVELOPER:	BAY DEVELOPERS, LLC 220 WESTON DRIVE DOVER, DE 19904 ATTN: MR. HENRY MAST
LAND PLANNERS, CIVIL ENGINEER:	MORRIS & RITCHIE ASSOCIATES, INC. 18 BOULDEN CIRCLE, SUITE 36 NEW CASTLE, DE 19720 ATTN: MR. PHILLIP L. TOLLIVER, P.E.
SURVEYOR:	MORRIS & RITCHIE ASSOCIATES, INC. 8 WEST MARKET STREET GEORGETOWN, DE 19947 ATTN: MR. GARY POWERS
ENVIRONMENTAL CONSULTANT:	GEO-TECHNOLOGY ASSOCIATES, INC. 3445 BOX HILL CORPORATE CENTER DRIVE, SUITE A ABINGDON, MD 21009 ATTN: MR. ANDY STANSFIELD
GEOTECHNICAL ENGINEER:	GEO-TECHNOLOGY ASSOCIATES, INC. 21133 STERLING AVENUE, SUITE 7 GEORGETOWN, DE 19947 ATTN: MR. GREG SAUTER
TRAFFIC CONSULTANT:	THE TRAFFIC GROUP 9900 FRANKLIN SQUARE DR. - SUITE H BALTIMORE, MD 21236 ATTN: MR. JOE CALOGGERO, P.E.
ATTORNEY:	MORRIS JAMES WILSON HALBROOK & BAYARD LLP 107 N. MARKET STREET P.O. BOX 690 GEORGETOWN, DE 19947 ATTN: MR. DAVID C. HUTT

INDEX OF DRAWINGS

DEVELOPER'S CERTIFICATION

I, UNDERSIGNED, AS DEVELOPER OF THE PROPERTY SHOWN, HEREBY APPROVE THESE PLANS FOR DEVELOPMENT AS SHOWN OR OTHERWISE NOTED.

BAY DEVELOPERS, LLC — DATE
220 WESTON DRIVE
DOVER, DE 19904

OWNER'S CERTIFICATION

I, UNDERSIGNED, AS OWNER OF THE PROPERTY SHOWN, HEREBY APPROVE THESE PLANS FOR DEVELOPMENT AS SHOWN OR OTHERWISE NOTED.

BAY DEVELOPERS, LLC — DATE
220 WESTON DRIVE
DOVER, DE 19904

WETLANDS STATEMENT

GEO-TECHNOLOGY ASSOCIATES, INC. (GTA) HAS CONDUCTED A FIELD REVIEW WITHIN THE BOUNDARIES OF THIS PLAT TO EVALUATE THE PRESENCE OR ABSENCE OF POTENTIAL STATE AND FEDERAL JURISDICTIONAL WETLANDS FOR THE PURPOSES OF DELAWARE WETLAND AND SUBAQUEOUS LAND REGULATIONS AND SECTION 404 OF THE CLEAN WATER ACT. GTA'S REVIEW WAS CONDUCTED IN GENERAL ACCORDANCE WITH THE TECHNIQUES AND CRITERIA PROVIDED IN THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL: ATLANTIC AND GULF COSTAL PLAIN REGION (VERSION 2.0), DATED NOVEMBER 2010. THE LIMITS OF THE WETLANDS WERE EVALUATED IN THE FIELD BY GTA PERSONNEL USING BEST PROFESSIONAL JUDGEMENT. NO WETLANDS OR WATERWAYS WERE OBSERVED WITHIN THE BOUNDARIES OF THIS PLAT. NO STATE OR FEDERAL JURISDICTIONAL APPROVAL WAS OBTAINED FOR THIS PROPERTY.

ANDY STANSFIELD — DATE
GEO-TECHNOLOGY ASSOCIATES, INC.

ENGINEER'S CERTIFICATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE AND THAT THE PLAN SHOWN AND DESCRIBED HEREON, IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY ACCEPTED STANDARDS AND PRACTICES AND BY THE SUSSEX COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS TO THE EXTENT THAT IT DESCRIBES THE PROPOSED MANNER AND LAYOUT OF THE SUBDIVISION.

PHILLIP L. TOLLIVER, P.E. — DATE
DE LICENSE NO. #12484

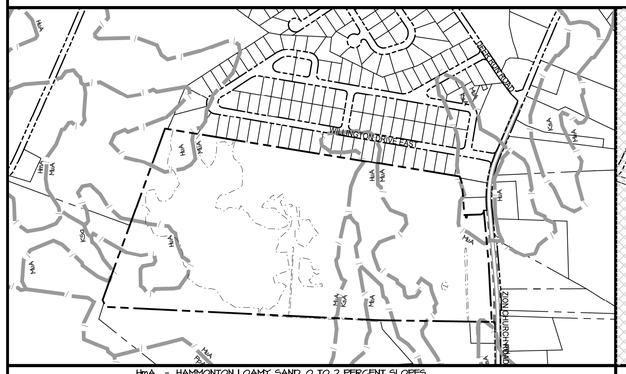
PLAN APPROVALS

SUSSEX COUNTY ENGINEERING DEPARTMENT
2 THE CIRCLE
GEORGETOWN, DE 19947

APPROVED — DATE

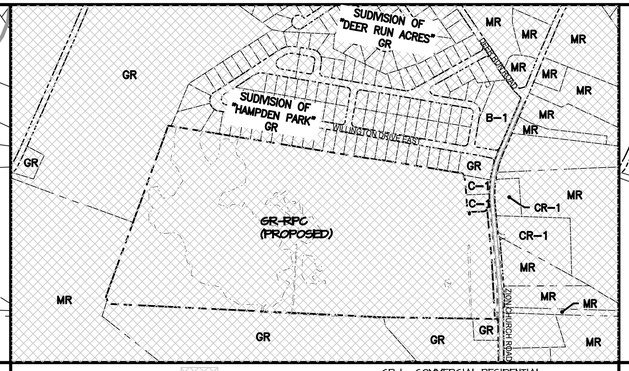
APPROVED BY: _____ DATE
CHAIRMAN OR SECRETARY
SUSSEX COUNTY PLANNING
AND
ZONING COMMISSION

APPROVED BY: _____ DATE
PRESIDENT
SUSSEX COUNTY PLANNING



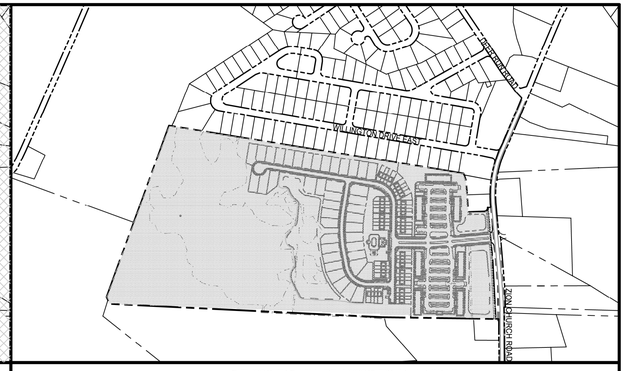
SOILS MAP
SCALE: 1" = 500'

- HmA - HAMMONTON LOAMY SAND, 0 TO 2 PERCENT SLOPES
- HuA - HURLOCK LOAMY SAND, 0 TO 2 PERCENT SLOPES
- KuA - KLEJ LOAMY SAND, 0 TO 2 PERCENT SLOPES
- MuA - MULLICA-BERRYLAND COMPLEX, 0 TO 2 PERCENT SLOPES
- PpA - PEPPERBOX LOAMY SAND, 0 TO 2 PERCENT SLOPES



ZONING MAP
SCALE: 1" = 500'

- COASTAL AREA (FORMERLY ESDDOZ)
- GR-1 - COMMERCIAL RESIDENTIAL
- C-1 - GENERAL COMMERCIAL
- GR - GENERAL RESIDENTIAL
- MR - MEDIUM RESIDENTIAL
- B-1 - NEIGHBORHOOD BUSINESS



PHASING MAP
SCALE: 1" = 500'

THE PROJECT WILL BE APPROVED AS A SINGLE PHASE PROJECT WITH THREE (3) OPERATIONAL BREAKS FOR PURPOSES OF BONDING, BENEFICIAL OCCUPANCY INSPECTION, RELEASE OF USE AND OCCUPANCY PERMITS.

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
18 BOULDEN CIRCLE, SUITE 36
NEW CASTLE, DELAWARE 19720
(302) 326-2200
FAX: (302) 326-2399
WWW.MRAGTA.COM

CHRISTOPHER J. FLATHERS — LICENSE No. 14787 — DELAWARE PROFESSIONAL ENGINEER — 04/28/21

ENGINEER'S SEAL

TITLE SHEET
PRELIMINARY PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC
04/27/21	UPDATED WETLANDS INFORMATION

JOB NO.: 20426
SCALE: AS NOTED
DATE: 10/21/2019
DRAWN BY: RDG
DESIGN BY: CJF
REVIEW BY: PLT
SHEET: 1 OF 8

CONSTRUCTION NOTES

1. CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT (1-800-282-8555) AT LEAST (3) WORKING DAYS PRIOR TO EXCAVATION, TO HAVE EXISTING UNDERGROUND UTILITIES LOCATED AND MARKED.
2. ALL MATERIALS & WORKMANSHIP SHALL MEET THE STATE OF DELAWARE STANDARDS & SPECIFICATIONS.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND PROJECT SPECIFICATIONS.
4. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING TWO WEEKS PRIOR TO THE START OF CONSTRUCTION AND SHALL APPRISE AND COORDINATE DURING ALL PHASES OF CONSTRUCTION:

A.	BAY DEVELOPERS, LLC	302-736-0924
B.	SUSSEX COUNTY ENGINEERING DEPARTMENT	302-855-7718
C.	ARTESIAN WATER COMPANY	302-453-6911
D.	SUSSEX CONSERVATION DISTRICT	302-856-2105
E.	DELMARVA POWER	604-758-4700
F.	VERIZON	302-422-1464
G.	DELAWARE ELECTRIC COOP CO.	302-344-5841
H.	DNREC	302-856-5488

5. CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL RIGHT-OF-WAY LINES AND PROPERTY LINES TO HIS OWN SATISFACTION. ALL PROPOSED UTILITIES ARE TO BE CONSTRUCTED WITHIN THE ROADWAY OR EASEMENT RIGHT-OF-WAY. DISTURBED AREAS BEYOND THE EASEMENT LINES SHALL BE RESTORED IMMEDIATELY TO THEIR ORIGINAL CONDITION.
6. INFORMATION SHOWN HEREON IS BASED UPON GIS DATA OBTAINED THROUGH THE STATE OF DELAWARE GIS WEBSITE (FIRSTMAP.DELAWARE.OPENDATA.ARCGIS.COM) AND DOES NOT REPRESENT FIELD RUN TOPOGRAPHIC OR BOUNDARY SURVEY. SITE LAYOUT IS SUBJECT TO REVISION PENDING FIELD SURVEY.
7. EXISTING UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE BASED UPON THE BEST AVAILABLE INFORMATION AND ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. NO GUARANTEE IS MADE OR IMPLIED REGARDING THE ACCURACY OR COMPLETENESS THEREOF. CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF DEPTH, SIZE AND MATERIAL OF ALL UNDERGROUND UTILITIES TO HIS OWN SATISFACTION BEFORE BEGINNING ANY EXCAVATION OR UTILITY INSTALLATION. THE OWNER AND ENGINEER DISCLAIM ANY RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. IF THE CONTRACTOR RELIES ON SAID INFORMATION, HE DOES SO AT HIS OWN RISK. THE GIVING OF THE INFORMATION ON THE PLANS WILL NOT RELIEVE THE CONTRACTOR OF HIS OBLIGATIONS TO SUPPORT AND PROTECT ALL SHOWN OR NOT SHOWN EXISTING UTILITIES AND APPURTENANCES. SHOULD ANY EXISTING UTILITIES BE DAMAGED BY THE CONTRACTOR, THE CONTRACTOR SHALL REPAIR THE DAMAGE CAUSED TO THE UTILITY OWNER'S SATISFACTION, AT THE CONTRACTOR'S EXPENSE.
8. DRAWINGS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE PERFORMED IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, AS AMENDED AND ALL RULES AND REGULATIONS THERETO APPURTENANT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF TRAFFIC IN ALL WORK AREAS.
10. ROUGH GRADING SHALL BE COMPLETE PRIOR TO THE CONSTRUCTION OF WATER & SEWER SYSTEMS.
11. USE ONLY SUITABLE AND APPROVED GRANULAR MATERIAL IN ACCORDANCE WITH SECTION 204 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS AND REFERENCED BY SUSSEX COUNTY ORDINANCE 38 SECTION 5-05 EXCAVATION AND BACKFILL FOR PIPE TRENCHES SUBSECTION B MATERIALS
12. CONTRACTOR SHALL ADJUST TO FINISH GRADE AS NECESSARY ANY VALVE BOXES, MANHOLES, CATCH BASINS ETC., PRIOR TO PLACING PAVING.
13. CONTRACTOR SHALL PROVIDE STAKEOUT NECESSARY FOR THE INSTALLATION OF UTILITIES, STORMDRAINS, PAVING AND ALL OTHER SITE WORK INCLUDED IN THESE PLANS. ALL STAKEOUT WORK IS TO BE PERFORMED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF DELAWARE.
14. CONTRACTOR TO MAINTAIN MINIMUM OF 3.0 FEET OF COVER OVER ALL NEW WATER LINES AS MEASURED FROM TOP OF PIPE TO FINISHED GRADE, UNLESS OTHERWISE NOTED.
15. SEWER LINES SHALL HAVE MINIMUM VERTICAL CLEARANCE OF 18 INCHES FROM WATER MAINS AT CROSSINGS. MAINTAIN A 10 FOOT MINIMUM PLAN SEPARATION BETWEEN SEWER AND WATER MAINS. SEWER LINES SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 12 INCHES FROM OTHER UTILITIES. IF THESE CLEARANCES CANNOT BE MAINTAINED, THEN PROVISIONS FOR PROPERLY ENCASING THE PIPE IN CONCRETE MUST BE PROVIDED.
16. LATERALS SHALL BE 6 INCHES IN DIAMETER, WITH VERTICAL CLEANOUTS OF 6 INCHES IN DIAMETER, AND TO HAVE A MINIMUM OF 3' OF COVER FROM SUSSEX COUNTY CLEANOUT TO MAIN LINE.
17. ALL GRAVITY SEWER PIPES SHALL BE PVC SDR 35. FOR PIPE SLOPES SEE FINAL CONSTRUCTION DRAWINGS FOR SANITARY SEWER PROFILES.
18. MATERIAL OF CONSTRUCTION FOR SEWER FORCE MAINS SHALL BE AS NOTED ON THE FINAL CONSTRUCTION DRAWINGS. FORCE MAIN SHALL BE INSTALLED AS PROFILED TO PREVENT FORMATION OF UNANTICIPATED HIGH POINTS IN THE INSTALLATION.
19. ALL SEWER LINES MUST BE SUCCESSFULLY TESTED ACCORDING TO SUSSEX COUNTY ORDINANCE 38, SECTION 5.09, E, 1-4, ON PAGE 515 THROUGH 518, ACCEPTANCE TESTING, PRIOR TO FINAL ACCEPTANCE.
20. ALL SANITARY SEWER SYSTEM CONSTRUCTION PERFORMED SHALL BE IN ACCORDANCE WITH SUSSEX COUNTY ORDINANCE 38, THESE PLANS AND ALL APPLICABLE CONSTRUCTION PERMITS.
21. ALL DROP MANHOLES TO BE 5'-0" IN DIAMETER.
22. FITTINGS SHOWN ON THE PLANS ILLUSTRATE ANTICIPATED ANGLE OF DEFLECTION. THIS INFORMATION IS SHOWN FOR GENERAL INFORMATION AND IS NOT GUARANTEED. ACTUAL ANGLE MAY VARY DUE TO FIELD CONDITIONS. USE OF ADDITIONAL FITTINGS SHALL BE AUTHORIZED BY THE ENGINEER.
23. THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR ANY DEVIATION FROM THESE PLANS UNLESS WRITTEN APPROVAL HAS BEEN PROVIDED BY THE ENGINEER.
24. ALL DISTURBED AREAS IN THE STATED RIGHT OF WAY, BUT NOT IN THE PAVEMENT SECTION MUST BE TOPSOILED (6" MINIMUM), FERTILIZED, MULCHED, AND SEEDED.
25. ALL PAVEMENT MARKINGS AND SIGNAGE SHALL BE PLACED IN ACCORDANCE WITH THE M.U.T.C.D. MANUAL, MOST CURRENT EDITION.
26. ALL PROPOSED STORM DRAIN DESIGNATED AS "RCCP" IS TO BE REINFORCED CONCRETE CIRCULAR PIPE, MEETING AASHTO M-170 SPECIFICATIONS. SEE FINAL CONSTRUCTION PLAN & PROFILES FOR SPECIFIC PIPE CLASS.
27. ALL LENGTHS OF SANITARY SEWER PIPE ARE MEASURED HORIZONTALLY FROM CENTER LINES OF INLETS, MANHOLES OR FITTINGS. ALL LENGTHS OF STORM DRAIN PIPE ARE MEASURED HORIZONTALLY FROM EDGE OF STRUCTURE TO EDGE OF STRUCTURE. ACTUAL TRUE LENGTHS OF PIPES ARE TO BE DETERMINED IN THE FIELD.
28. WHERE SPECIFIED, HDPE STORM DRAIN PIPE SHALL BE ADS N-12 (SMOOTH INTERIOR) PIPE WITH ADS PRO-LINK MT (BELL/BELL COUPLER) FOR WATER TIGHT CONNECTIONS. REFER TO PLAN AND PROFILES FOR MATERIALS USED.
29. ALL EMBEDMENT MATERIALS USED FOR BEDDING, HAUNCHING, AND INITIAL BACKFILL FOR HDPE PIPE SHALL CONFIRM TO AASHTO SECTION 30 AND ASTM D-2321 AS PER MANUFACTURER INSTALLATION REQUIREMENTS. CONTRACTOR SHALL ENSURE THAT PROPER LINE AND GRADE IS ESTABLISHED WITHIN TRENCH BEDDING PRIOR TO PLACEMENT OF PIPE AND THAT PROPER MATERIALS ARE USED AND COMPACTION IS ACHIEVED DURING HAUNCHING AND INITIAL BACKFILL. A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO VERIFY SUITABILITY OF MATERIALS USED AND PROPER COMPACTION. ANY DEVIATION IN LINE AND GRADE OR OBVIOUS JOINT SEPARATION SHALL BE CORRECTED PRIOR TO ESTABLISHMENT OF FINAL SUBGRADE AND PAVEMENT SURFACE. THE CONTRACTOR SHALL TAKE EVERY CARE TO ENSURE CORRECT PIPE INSTALLATION.
30. UNLESS OTHERWISE SPECIFIED ALL ROADWAY INLETS SHALL HAVE A TYPE I INLET GRATE AND TYPE S TOP UNIT PER DELDOT STANDARDS, CURRENT REVISION.
31. IT IS THE CONTRACTORS RESPONSIBILITY TO INSURE THAT PAVING IS INSTALLED TO THE ELEVATIONS SHOWN AND THAT NO PONDING OF WATER EXISTS AFTER PAVING IS COMPLETE.

SUSSEX COUNTY CONSTRUCTION NOTES:

1. ROADWAY STAKEOUTS:
   - A. RIGHT-OF-WAY STAKES SHALL BE OFFSET A MINIMUM OF FIVE (5) FEET OUTSIDE THE RIGHT-OF-WAY.
   - B. STATION NUMBERS TO BE INDICATED ON EACH SIDE OF THE STAKE.
   - C. THE CENTERLINE ROADWAY CUT AND CUT-LINE SHALL BE LOCATED ON THE SIDE OF THE STAKE WHICH FACES THE CENTERLINE, ALSO A "CL" DESIGNATION SHALL BE INCLUDED.
   - D. THE SHALE CUT AND CUT-LINE SHALL BE INDICATED ON THE OUTSIDE OF THE STAKE, WHILE ALSO CONTAINING A "SH" DESIGNATION.
2. THE CONTRACTOR SHALL PROVIDE TWO (2) WORKING DAYS NOTICE TO THE COUNTY INSPECTOR PRIOR TO PAVING, AT THIS TIME, THE INSPECTOR MAY REQUIRE THE CONTRACTOR COMPLETE RELATED OR UNRELATED WORK ITEMS BEFORE PAVING MAY BEGIN.
3. SURFACE TREATMENT SHALL NOT BE APPLIED: (SURFACE TREATMENT NOT USED)
   - A. AFTER NOVEMBER 1 OR PRIOR TO APRIL 1; OR
   - B. WHEN THE TEMPERATURE IS BELOW 50° F; OR
   - C. ON ANY WET OR FROZEN SURFACE.
4. HOT MIX SHALL NOT BE APPLIED:
   - A. WHEN THE TEMPERATURE IS BELOW 40° F; OR
   - B. ON ANY WET OR FROZEN SURFACE.
5. FOR ALL WOODED AREAS, A SUFFICIENT AREA BEYOND THE RIGHT-OF-WAY SHALL BE CLEARED AND GRUBBED TO ALLOW PROPER GRADING OF THE ROADWAY SWALE BACKSLOPES.
6. ALL DISTURBED AREAS MUST BE STABILIZED WITH 4 INCHES OF TOPSOIL, SEED, AND MULCH.

DELDOT RECORD PLAN NOTES:

1. NO LANDSCAPING SHALL BE ALLOWED WITHIN DELDOT MAINTAINED R/W UNLESS THE PLANS ARE COMPLIANT WITH SECTION 3.7 OF THE DEVELOPMENT COORDINATION MANUAL (DCM).
2. ALL ENTRANCES SHALL CONFORM TO THE DELAWARE DEPARTMENT OF TRANSPORTATION'S (DELDOT'S) CURRENT DEVELOPMENT COORDINATION MANUAL (DCM) AND SHALL BE SUBJECT TO ITS APPROVAL.
3. SHRUBBERY, PLANTINGS, SIGNS AND/OR OTHER VISUAL BARRIERS THAT COULD OBSTRUCT THE SIGHT DISTANCE OF A DRIVER PREPARING TO ENTER THE ROADWAY ARE PROHIBITED WITHIN THE DEFINED DEPARTURE SIGHT TRIANGLE AREA ESTABLISHED ON THIS PLAN. IF THE ESTABLISHED DEPARTURE SIGHT TRIANGLE AREA IS OUTSIDE THE RIGHT-OF-WAY OR PROJECTS ONTO AN ADJACENT PROPERTY OWNER'S LAND, A SIGHT EASEMENT SHOULD BE ESTABLISHED AND RECORDED WITH ALL AFFECTED PROPERTY OWNERS TO MAINTAIN THE REQUIRED SIGHT DISTANCE.
4. UPON COMPLETION OF THE CONSTRUCTION OF THE SIDEWALK OR SHARED-USE PATH ACROSS THIS PROJECT'S FRONTAGE AND PHYSICAL CONNECTION TO ADJACENT EXISTING FACILITIES, THE DEVELOPER, THE PROPERTY OWNERS OR BOTH ASSOCIATED WITH THIS PROJECT, SHALL BE RESPONSIBLE TO REMOVE ANY EXISTING ROAD TIE-IN CONNECTIONS LOCATED ALONG ADJACENT PROPERTIES, AND RESTORE THE AREA TO GRASS. SUCH ACTIONS SHALL BE COMPLETED AT DELDOT'S DISCRETION, AND IN CONFORMANCE WITH DELDOT'S SHARED-USE PATH AND/OR SIDEWALK TERMINATION POLICY.
5. SUBDIVISION STREETS CONSTRUCTED WITHIN THE LIMITS OF THE RIGHT-OF-WAY ARE PRIVATE AS SHOWN ON THIS PLAN AND ARE TO BE MAINTAINED BY THE DEVELOPER, HOMEOWNERS ASSOCIATION, OR BOTH, THE STATE OF DELAWARE ASSUMES NO MAINTENANCE RESPONSIBILITIES FOR THE FUTURE MAINTENANCE OF THESE STREETS.
6. THE SIDEWALK AND SHARED-USE PATH SHALL BE THE RESPONSIBILITY OF THE DEVELOPER, THE PROPERTY OWNERS OR BOTH WITHIN THIS SUBDIVISION. THE STATE OF DELAWARE ASSUMES NO RESPONSIBILITY FOR THE FUTURE MAINTENANCE OF THE SIDEWALK AND/OR SHARED-USE PATH.
7. ALL LOTS SHALL HAVE ACCESS ONLY FROM THE INTERNAL SUBDIVISION STREETS.
8. DRIVEWAYS WILL NOT BE PERMITTED TO BE PLACED AT CATCH BASIN LOCATIONS.
9. THE DEVELOPER SHALL BE REQUIRED TO FURNISH AND PLACE RIGHT-OF-WAY MONUMENTS IN ACCORDANCE WITH DELDOT'S DEVELOPMENT COORDINATION MANUAL.
10. THE DEVELOPER SHALL BE REQUIRED TO FURNISH AND PLACE RIGHT-OF-WAY MARKERS TO PROVIDE A PERMANENT REFERENCE FOR RE-ESTABLISHING THE RIGHT-OF-WAY AND PROPERTY CORNERS ON LOCAL AND HIGHER ORDER FRONTAGE ROADS. RIGHT-OF-WAY MARKERS SHALL BE SET AND/OR PLACED ALONG THE FRONTAGE ROAD RIGHT-OF-WAY AT PROPERTY CORNERS AND AT EACH CHANGE IN RIGHT-OF-WAY ALIGNMENT IN ACCORDANCE WITH SECTION 3.2.4.2 OF THE DEVELOPMENT COORDINATION MANUAL.

PROJECT PHASING

PHASE I - 4 YEARS

TOTAL PROJECT BUILDOUT - 4 YEARS
ESTIMATED PROJECT COMPLETION DATE - DECEMBER 2024

THE PROJECT IS BE APPROVED AS A SINGLE PHASE PROJECT, WITH THREE (3) OPERATIONAL BREAKS FOR PURPOSES OF BONDING, BENEFICIAL OCCUPANCY INSPECTION, RELEASE OF USE AND OCCUPANCY PERMITS.

GENERAL NOTES:

1. SUBDIVISION STREETS ARE TO REMAIN PRIVATE AND ARE TO BE CONSTRUCTED IN ACCORDANCE WITH SUSSEX COUNTY REGULATIONS.
2. MAINTENANCE OF THE STREET WITHIN THIS SUBDIVISION WILL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER AND/OR HOME OWNER'S ASSOCIATION. THE STATE AND SUSSEX COUNTY ASSUMES NO RESPONSIBILITY FOR FUTURE MAINTENANCE OF THE STREETS.
3. ACCESS TO ALL LOTS IS TO BE FROM SUBDIVISION STREETS OR DRIVE ACCESS LOOPS.
4. MAINTENANCE OF THE STORM WATER MANAGEMENT AREAS WILL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER AND/OR HOMEOWNER'S ASSOCIATION.
5. THE PROPOSED ENTRANCES/EXITS ARE CONCEPTUAL ONLY AND ARE SUBJECT TO REVIEW AND APPROVAL BY THE DELAWARE DEPARTMENT OF TRANSPORTATION BEFORE A CONSTRUCTION PERMIT IS ISSUED.

SITE DATA

PROJECT TITLE/NAME: TWIN CEDARS

1. TAX PARCEL: 533-11.00-42.00
2. OWNER INFORMATION: TWIN CEDARS, LLC (ATTN: MR. JAMES T. GORDON)
   5421 YORK LANE
   BETHESDA, MD 20814
3. DEVELOPER: BAY DEVELOPERS, LLC
   200 WESTON DRIVE
   DOVER, DE 19904
4. ZONING:
   EXISTING: C-1, CR-1, AND GR
   PROPOSED: GR WITH RPC OVERLAY
5. DEVELOPMENT TYPE: RESIDENTIAL PLANNED COMMUNITY (RPC)
   SINGLE FAMILY DETACHED
   MULTI-FAMILY - APARTMENTS
   MULTI-FAMILY - TOWNHOMES
6. BULK AREA STANDARDS (GR-RPC)

SINGLE FAMILY:	GR ZONE:	PROPOSED BY RPC:
MIN. FRONT YARD	40'	25'
MIN. SIDE YARD	10'	10'
MIN. REAR YARD	10'	10'
MIN. LOT WIDTH	75'	60'
MIN. LOT AREA	10,000 SF	7,500 SF

TOWNHOMES:	GR ZONE:	PROPOSED BY RPC:
MIN. FRONT YARD	40'	25'
MIN. SIDE YARD	10'	5'
MIN. REAR YARD	10'	10'
MIN. LOT AREA	1,600 SF	2,310 SF
AVG. LOT AREA	3,630 SF	2,940 SF
MIN. BLDG. SEPARATION	30'	26'

APARTMENTS:	GR ZONE:	PROPOSED BY RPC:
MIN. FRONT YARD	40'	25'
MIN. SIDE YARD	10'	5'
MIN. REAR YARD	10'	10'
MIN. LOT AREA	3,630 SF	3,630 SF

7. LAND USE:
   EXISTING USE: AGRICULTURAL
   PROPOSED USE: RESIDENTIAL
8. PROPOSED DWELLING UNITS:

MULTI-FAMILY - APARTMENTS:	168
MULTI-FAMILY - TOWNHOMES:	44
SINGLE FAMILY:	42
TOTAL	254 D.U.

9. DEVELOPMENT DENSITY COMPUTATIONS:

NET SITE AREA:	
TOTAL SITE AREA:	64.32 AC. ±
PROPOSED ROAD ROW:	4.43 AC. ±
NET SITE AREA:	58.84 AC. ±

ALLOWABLE DWELLING UNITS:
NET SITE AREA * ALLOWABLE DENSITY = ALLOWABLE D.U.
GR, 58.84 AC. X 12.0 D.U. / AC. = 706 D.U.

PROPOSED DENSITY:
254 D.U. / 58.84 AC. ± = 4.31 D.U./AC. (NET)
254 D.U. / 64.32 AC. ± = 3.95 D.U./AC. (GROSS)

10. OPEN SPACE AREAS:

REQUIRED [SECTION 99.21(D)]:	
10% X 64.32 AC ± =	6.43 AC.±
PROPOSED*:	
PASSIVE: (INCL. NATURAL FOREST & BUFFER AREAS, STORMWATER MANAGEMENT AREAS, ETC.)	40.29 AC. ±
ACTIVE: (INCL. COMMUNITY POOL, RECREATION AREA, & WALKING TRAIL))	1.07 AC. ±
TOTAL PROPOSED (42.51 AC. / 64.32 AC.) =	41.36 AC. ± 64 %

*NOTE: OPEN SPACE CALCULATION INCLUDES 3.93 AC. ± LOCATED WITHIN APARTMENT LOT AREAS.

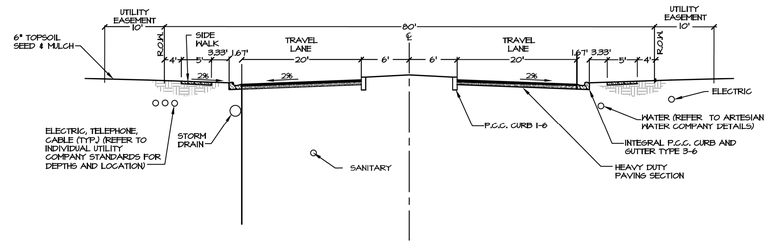
11. FOREST COVER:

EXIST. FOREST:	38.78 AC. ±
FOREST CLEARED:	10.32 AC. ±
FOREST REMAINING:	28.46 AC. ±
REFORESTATION:	0.00 AC. ±
PROPOSED TOTAL:	28.46 AC. ±

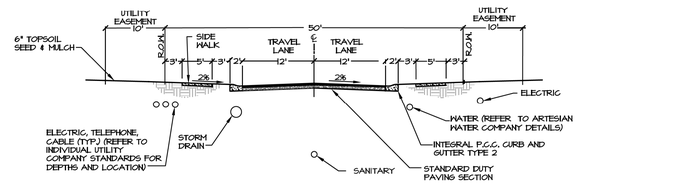
12. WATER SERVICE: PUBLIC (ARTESIAN WATER)
13. SANITARY SEWER: PUBLIC (SUSSEX COUNTY)
14. PARKING ANALYSIS:

PARKING REQUIRED:	168 MF - APT X 2 SP/DU =	336 SP
	44 MF - TH X 2 SP/DU =	88 SP
	42 SFD X 2 SP/DU =	84 SP
	TOTAL =	508 SP
PARKING PROVIDED:	168 MF - APT X 2 SP/DU =	357 SP
	44 MF - TH X 2 SP/DU =	88 SP
	42 SFD X 2 SP/DU =	84 SP
	CLUBHOUSE AREA =	13 SP
	TOWNHOUSE OVERFLOW =	21 SP
	TOTAL =	563 SP

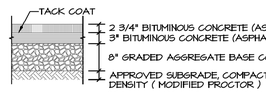
15. A WETLAND REPORT FOR THE SUBJECT PROJECT AREA HAS PREPARED BY GEO-TECHNOLOGY ASSOCIATES, INC. (GTA) IN MARCH 2021. BASED ON THIS REVIEW, IT IS GTA'S PROFESSIONAL OPINION THAT THERE ARE NO TIDAL WETLANDS, OR JURISDICTIONAL NON-TIDAL WETLANDS, INCLUDING "WATERS OF THE U.S." PRESENT WITHIN THE SUBJECT SITE. JURISDICTIONAL DETERMINATION APPLICATIONS HAVE BEEN FILED WITH DNREC AND ACOE.
16. ALL DROP MANHOLES TO BE 5' OR LARGER IN DIAMETER.
17. ALL FACILITIES TO MEET SUSSEX COUNTY ENGINEERING DEPARTMENT'S STANDARDS AND SPECIFICATIONS.
18. CLEANOUTS TO BE AT EDGE OF ROAD PAVEMENT OR EDGE OF RIGHT-OF-WAY; 6-INCH LATERAL FOR ALL SINGLE FAMILY HOUSES.
19. NO CHURCHES, SCHOOLS, OR COMMERCIAL USE AREAS PROPOSED ON THIS SITE.



TYPICAL SECTION - ENTRANCE ROAD (80' R.OW.)
NOT TO SCALE

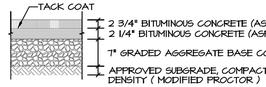


TYPICAL CLOSED SECTION ROAD (50' R.O.W.)
NOT TO SCALE



IN ACCORDANCE WITH DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS-SECTION 401

HEAVY DUTY



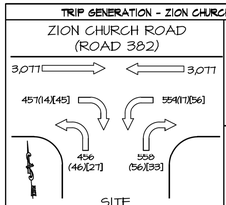
IN ACCORDANCE WITH DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS-SECTION 401

STANDARD DUTY

NOTE: STANDARD DUTY PAVING TO BE USED IN PARKING AREA FOR APARTMENTS

PAVING SECTIONS
NOT TO SCALE

TRIP GENERATION - ZION CHURCH ROAD (S 382) - FULL MOVEMENT



TRAFFIC GENERATION DIAGRAM
TRIPS PER DAY (VEHICLES IN A.M.) [P.M. PEAK HOUR]

ROAD TRAFFIC DATA:
FUNCTIONAL CLASSIFICATION = MAJOR COLLECTOR
POSTED SPEED LIMIT = 50 MPH
AADT =5305 (FROM 2018 DELDOT TRAFFIC SUMMARY)
10 YEAR PROJECTED AADT = 1.16 X 5305 TRIPS = 6154 TRIPS
TRAFFIC PATTERN GROUP = 8 (FROM 2018 DELDOT TRAFFIC SUMMARY)
K FACTOR = 11.7%
DESIGN HOURLY VOLUME = 6,154 x 11.7% = 720 VPH

SITE TRIPS GENERATED:
SOURCE: ITE TRIP GENERATION MANUAL 10TH EDITION.
42 SINGLE FAMILY DETACHED HOUSING (210) = 468 ADT
212 APARTMENTS & TOWNHOMES (220) = 1562 ADT
TOTAL SITE: 2030 ADT
ENTRANCE 1 OF 1 - FULL MOVEMENT
DESIGN VEHICLE: WB-50
DIRECTIONAL DISTRIBUTION:
55% TO AND FROM THE EAST - 1,117 TRIPS (73 AM PK) [241 PM PK]
45% TO AND FROM THE WEST - 913 TRIPS (60 AM PK) [72 PM PK]

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
18 BOULDEN CIRCLE, SUITE 36
NEW CASTLE, DELAWARE 19720
(302) 326-2200
FAX: (302) 326-2399
WWW.MRAGTA.COM

CHRISTOPHER J. FLATHERS LICENSE No. 14787 DELAWARE PROFESSIONAL ENGINEER 04/28/21
ENGINEER'S SEAL

GR-RPC
GENERAL NOTES & DETAILS
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC
04/27/21	UPDATED WETLANDS INFORMATION

JOB NO.: 20426
SCALE: AS NOTED
DATE: 10/21/2019
DRAWN BY: RDG
DESIGN BY: CJF
REVIEW BY: PLT
SHEET: 2 OF 8

BRIGHTON ROAD

WILLINGTON DRIVE EAST

WILLINGTON DRIVE NORTH

SUBDIVISION OF "HAMPDEN PARK"
BOOK 2878 PAGE 44
ZONING: GR

OPEN SPACE

N/F
LORRAINE M. LYNCH
533-11.00-37.00
ZONING: GR

N/F
WILLAM D. & KAREN L. SIMPSON
533-11.00-36.00
BOOK 2196 PAGE 254
ZONING: AR-1

20' WIDE VEGETATED BUFFER (TYP.)

VALLEY ROCK ROAD

20' WIDE VEGETATED BUFFER

BASTON BRANCH TAX DITCH PRONG 1

N/F
WAYNE L. HOPPER
533-11.00-199.00
BOOK 2323 PAGE 318
ZONING: GR

BLDG 1 (24 UNITS)

TRASH ENCLOSURE

N/F
LOUIS N. & CHERYL H. ESPOSITO
533-11.00-42.01
BOOK 4451 PAGE 5
ZONING: C-1

N/F
DIANE THOMPSON
533-11.00-42.02
BOOK 4451 PAGE 5
ZONING: C-1

ZION CHURCH ROAD - S.R. 20 (ROAD 382)

SWM AREA

BLACKSTONE BOULEVARD

RUSTIC LEDGE LANE

COMMUNITY ACTIVE RECREATION AREA**

BLDG 3 (24 UNITS)

BLDG 4 (24 UNITS)

BLDG 5 (24 UNITS)

BLDG 6 (24 UNITS)

ZONING: GR*
ZONING: CR-1

ZONING: C-1
ZONING: GR*

75' WIDE BUFFER (TYP.)

EX. POND

TRASH ENCLOSURE

15' WIDE DELDOT EASEMENT

PROP. INTERCONNECTION W/ TEMPORARY TURNAROUND

20' WIDE VEGETATED BUFFER

PROP. MAINTENANCE BUILDING

BASTON BRANCH TAX DITCH PRONG 1

N/F
CSM, LLC
533-11.00-43.01
BOOK 2771 PAGE 58
ZONING: GR

BASTON BRANCH TAX DITCH SUB 2 PRONG 1

N/F
LAWRENCE R. AND DEBORAH R. LONG, TRUSTEES
BOOK 4903 PAGE 31
533-11.00-44.00
ZONING: GR

N/F
LAWRENCE R. AND DEBORAH R. LONG, TRUSTEES
533-11.00-43.00
BOOK 4903 PAGE 31
ZONING: GR

NORTH
NAD83

LEGEND

- EXIST. PARCEL BOUNDARY
- EXIST. RIGHT-OF-WAY
- EXIST. LOT LINE
- ZONING: AR-1 — EXIST. ZONING
- EXIST. WOODS
- PROP. WOODS TO REMAIN
- PROP. CURB
- PROP. SIDEWALK
- PROP. LOT LINE
- PROP. RIGHT-OF-WAY
- PROP. ROAD CENTERLINE
- PROP. SWM AREA
- NW NW / NW NW — EXIST. JURISDICTIONAL NON-TIDAL WETLANDS
- US US — EXIST. "WATERS OF U.S."
- EXIST. TAX DITCH R/W (TO REMAIN)
- EXIST. TAX DITCH R/W (TO BE REVISED)

100 50 0 50 100 200
SCALE: 1" = 100'

* NOTE:
ALL EXISTING PORTIONS OF THE SITE CURRENTLY ZONED C-1 OR CR-1 AREAS ON THE SUBJECT PARCEL ARE TO BE REZONED GR BY THIS PLAN.

** NOTE:
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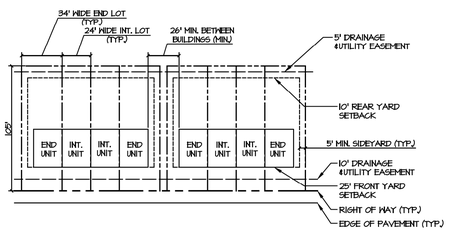
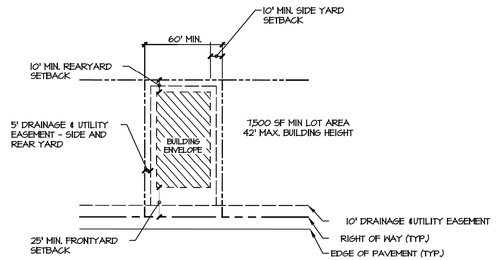


TYPICAL LAYOUT TOWNHOME
24' WIDE DWELLING UNITS

NOT TO SCALE



TYPICAL LAYOUT SINGLE FAMILY LOT
(VARIABLE WIDTHS)

NOT TO SCALE

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CHRISTOPHER J. FLATTERY LICENSE No. 14207 DELAWARE PROFESSIONAL ENGINEER 04/28/21
ENGINEER'S SEAL

PRELIMINARY PLAN
MASTER GR-R.P.C. PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC
04/27/21	UPDATED WETLANDS INFORMATION

JOB NO.: 20426
SCALE: 1"= 100'
DATE: 10/21/19
DRAWN BY: RDG
DESIGN BY: CJF
REVIEW BY: PLT
SHEET: 3 OF 8

PROPOSED OPEN SPACE SUMMARY

AREA	SWM FACILITY	ACTIVE OPEN SPACE	PASSIVE OPEN SPACE*
A	1.41 AC. ±	-	2.15 AC. ±
B	0.43 AC. ±	-	1.78 AC. ±
C	3.47 AC. ±	1.07 AC. ±	37.57 AC. ±
TOTAL	5.31 AC. ±	1.07 AC. ±	41.50 AC. ±

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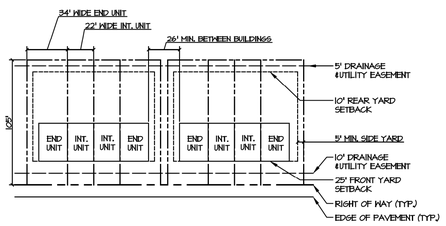

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24' WIDE DWELLING UNITS
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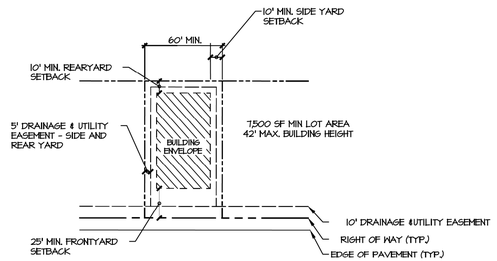

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ENGINEER'S SEAL

PRELIMINARY PLAN
OVERALL PRELIMINARY PLAN
FOR
TWIN CEDARS

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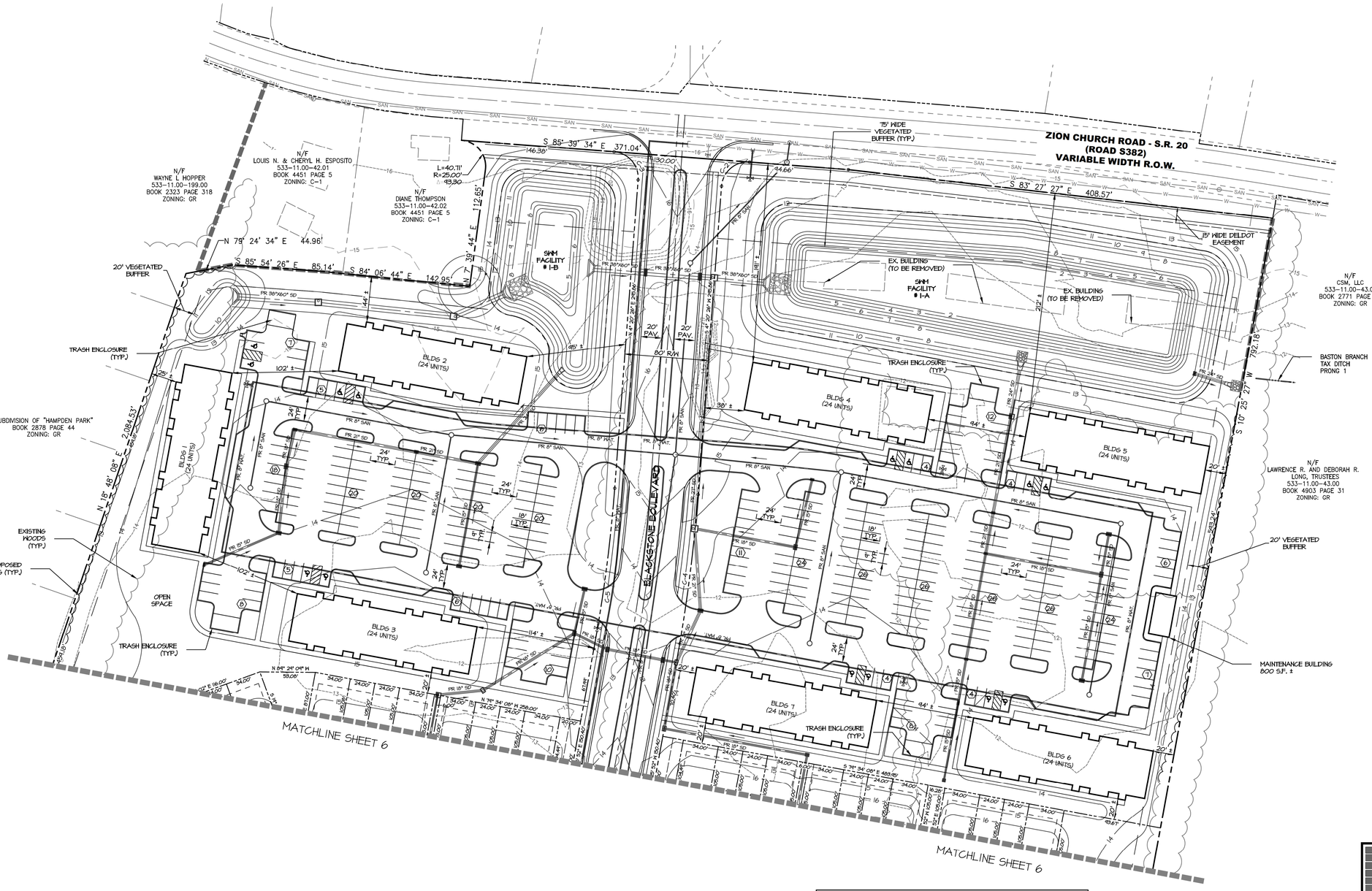

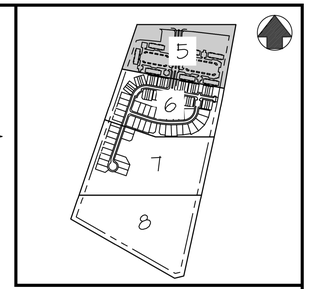

KEY MAP
SCALE: 1"=800'

LEGEND

- EXIST. PARCEL BOUNDARY
- EXIST. RIGHT-OF-WAY
- EXIST. LOT LINE
- ZONING: AR-1 — EXIST. ZONING
- EXIST. WOODS
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- W — EXIST. WATER LINE
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RIGHT-OF-WAY CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-2	25.00'	34.27'	S 44° 20' 26" W	35.36'
C-3	25.00'	34.27'	N 40° 34' 34" W	35.36'
C-4	1,540.00'	163.10'	S 07° 23' 09" W	163.63'
C-5	1,460.00'	155.20'	N 07° 23' 09" E	155.13'

50 25 0 25 50 100
SCALE: 1" = 50'

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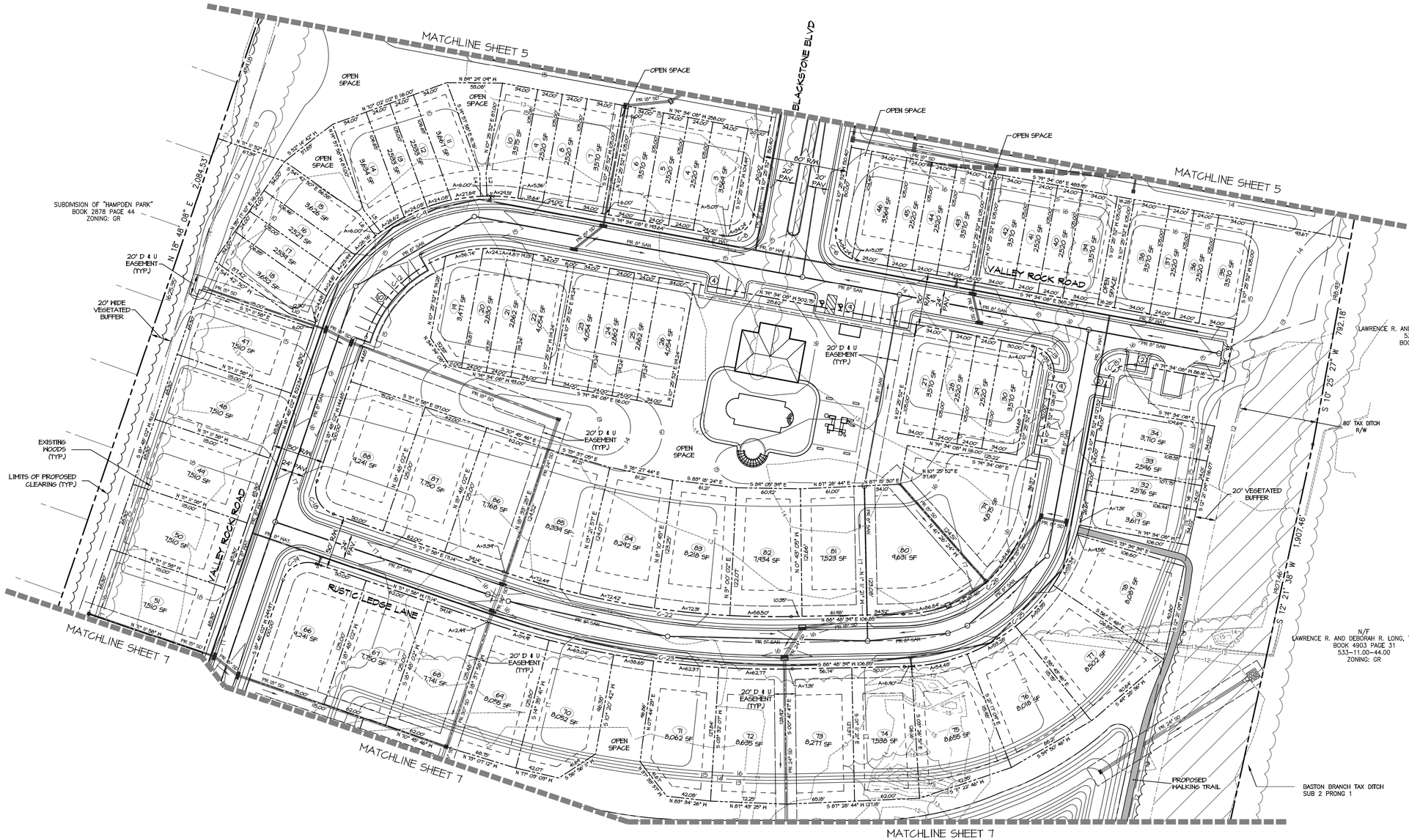

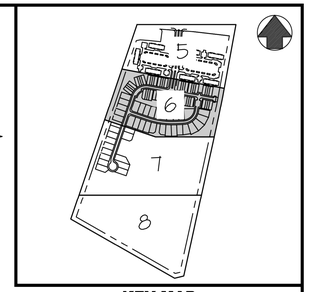

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PROPERTY LINE TABLE

LINE	BEARING	DISTANCE
L2	N 01° 58' 07" W	21.48'
L4	S 01° 58' 07" E	21.48'
L5	S 31° 32' 44" E	26.53'
L6	S 31° 32' 44" E	26.53'
L10	S 71° 11' 58" E	26.51'

RIGHT-OF-WAY CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-6	25.00'	34.27'	S 34° 34' 08" E	35.36'
C-8	25.00'	34.27'	N 55° 25' 52" E	35.36'
C-9	175.00'	244.33'	N 54° 36' 57" E	228.77'
C-12	125.00'	176.09'	S 54° 36' 57" W	163.41'
C-13	25.00'	34.27'	N 34° 34' 08" W	35.36'
C-15	25.00'	34.27'	S 55° 25' 52" W	35.36'
C-16	25.00'	34.27'	S 26° 11' 58" E	35.36'
C-19	25.00'	34.27'	S 63° 48' 02" W	35.36'
C-22	800.00'	279.11'	S 81° 11' 34" E	277.64'
C-23	850.00'	246.55'	N 81° 11' 34" W	245.05'
C-25	175.00'	238.25'	S 44° 48' 36" W	220.27'
C-26	125.00'	171.00'	N 44° 37' 16" E	157.47'

50 25 0 25 50 100
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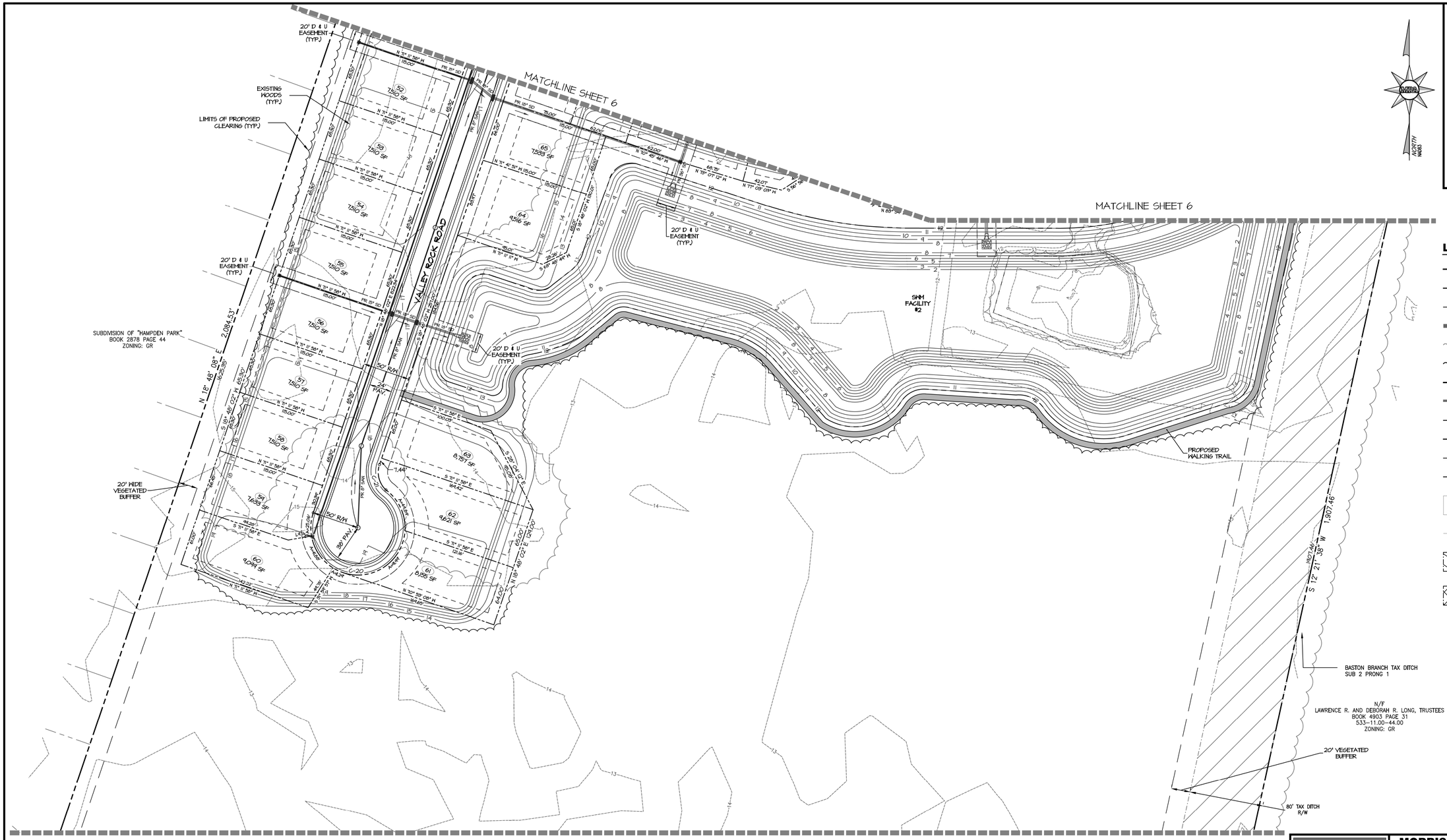

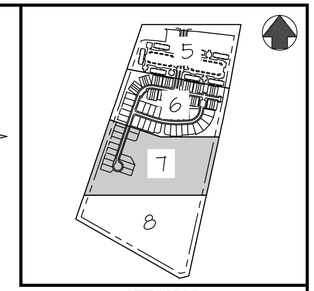

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CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-20	50.00'	220.11'	S 72° 35' 33" W	80.78'
C-21	25.00'	29.18'	S 14° 38' 12" E	27.55'

50 25 0 25 50 100
SCALE: 1" = 50'

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		SHEET: 7 OF 8

MATCHLINE SHEET 7

MATCHLINE SHEET 7

SUBDIVISION OF "HAMPDEN PARK"
BOOK 2878 PAGE 44
ZONING: GR

N 18° 48' 08" E 2,084.53'

20' VEGETATED BUFFER

N 60° 23' 55" W 1,273.21'

N/F
LORRAINE M. LYNCH
533-11.00-37.00
ZONING: GR

20' WIDE VEGETATED BUFFER

N/F
WILLAM D. & KAREN L. SIMPSON
533-11.00-36.00
BOOK 2196 PAGE 254
ZONING: AR-1

S 76° 26' 25" W 54.01'

ZONING: GR

ZONING: AR-1

N/F
LAWRENCE R. AND DEBORAH R. LONG, TRUSTEES
BOOK 4903 PAGE 31
533-11.00-44.00
ZONING: GR

BASTON BRANCH TAX DITCH
SUB 2 PRONG 1

S 12° 21' 38" W 1,907.46'

1907.46'

20' VEGETATED BUFFER

80' TAX DITCH R/W

20' VEGETATED BUFFER

NORTH
NAD83

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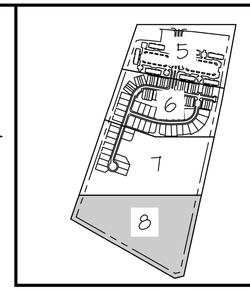
SCALE: 1" = 50'



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ENVIRONMENTAL ASSESSMENT AND PUBLIC FACILITY EVALUATION REPORT
FOR PROPOSED AMENDEMENT TO
BAY FOREST CLUB (CZ #1526, 1741, & 1795) – Phase 6

(PARCEL 17.01 / APPLICATION CZ #1921)

MORRIS & RITCHIE ASSOCIATES, INC.
ARCHITECTS, ENGINEERS, PLANNERS, SURVEYORS, & LANDSCAPE ARCHITECTS

8 West Market Street
Georgetown, Delaware 19947
(302) 855-5734 • (302) 855-0157 (FAX)
www.mragta.com

MRA 12347x20

March 2020

INTRODUCTION

On behalf of Bay Forest, LLC, we are pleased to provide the Environmental Assessment and Public Facility Evaluation Report pursuant to a proposed modification of the previously approved Bay Forest Club RPC for infill Section Z / Phase 6. Phase 6 encompasses all of Parcel 17.01 and overlaps portions of existing Parcels 134-8.00-1071.01 & 134-8.00-15.02. This parcel is located east of Whites Neck Road (SR 347), north of the intersection of Sanderling Drive and Widgeon Drive. The current access to Parcel 134-8.00-15.02 is via Sprogell Lane; a private dirt access drive that extends to a direct connection at Whites Neck Road. The portion of Sprogell Lane in the Phase 6 project area will be removed as part of this infill development. Refer to the proposed site plan and site data shown on the Amended Master Record MR-RPC Plan attached as Exhibit 1.

The infill site is located in the Environmentally Sensitive Development District Overlay Zone (ESDDOZ). Development of this parcel will provide for infill development that results in significant environmental benefits, and effective integration of the parcels into the network of existing public facilities and surrounding Bay Forest Club Community.

The project was previously reviewed through a Delaware Office of State Planning (DEOSP) PLUS review process. Responses to the PLUS comments with supporting documentation are included with this requested zoning change from commercial and AR to MR-RCP and revised layout shown in the amendment to the Bay Forest Club MR-RPC for parcels 15.02, 15.03, 17.0, 17.02 and 18.0.

CRITERIA EVALUATION

Each item in the County Code § 115-194.3 are listed in ***bold italicized text*** followed by a summary addressing each item as follows:

(a) Proposed drainage design and the effect on stormwater quality and quantity leaving the site, including methods for reducing the amount of phosphorous and nitrogen in the stormwater runoff and the control of any other pollutants such as petroleum hydrocarbons or metals.

The effect on overall stormwater quality and quantity will be greatly improved by the development of this property as part of the surrounding Residential Planned Community when compared to the current use for raising livestock and a single-family residence.

In the current condition, the site is characterized by a single-family residence with forested land utilized for livestock management purposes. Access to the existing site is via Sprogell Lane, a private dirt / gravel road. An existing stormwater management facility is located north of the site in existing Bay Forest Club Section X / Phase 5.1. The existing facility combines an extended detention wet pond and constructed wetland and will be expanded by removing the existing driveway. This facility was constructed prior to the February 2019 Delaware Sediment and Stormwater Regulations. It also part of a regional stormwater management system for the Bay Forest Club Subdivision and ultimately discharges into the tidally influenced Collins Creek.

Redevelopment of this parcel and integration into the Bay Forest Club RPC will substantially improve water quality by eliminating nutrients from surface runoff from the existing small scale livestock operation and elimination of the existing dirt access drive that directly contributes untreated sediment-laden runoff on an ongoing basis to the receiving water courses.

The proposed stormwater quality facilities provide treatment for petroleum hydrocarbons, nutrients and other pollutants. Nutrient management for the surrounding existing Bay Forest Club is managed by the existing homeowner's association. The homeowner's association management

will be expanded to include Phase 6 associated with this Application, in accordance with State regulations.

Immediately connecting the proposed development to the County wastewater treatment facilities will also substantially reduce the discharge of nutrients and other pollutants to the shallow groundwater aquifer.

The use of green-technology low-impact development (LID) storm water management facilities and constructed wetlands has been implemented widely throughout the Bay Forest Club RPC project. This project will see the expansion and use of a previously built facility, which is a combination wet pond and constructed wetland. Runoff from this infill phase will be further treated through conveyance in a stormwater "treatment chain" that passed through 3 other existing SWM facilities before discharging into Collins Creek.

Additionally, pre-treatment measures such as filter strips and sheet flow through landscape areas are proposed to be implemented where feasible, as approved by the Sussex Conservation District. The result will be a reduction in nitrogen and phosphorous significantly greater than the minimum 40 percent reductions for the Inland Bays Watershed. It is important to note that the Applicant also voluntarily complied with the nutrient reductions for the existing Bay Forest Club project that these current phases will be part of, even though the previously approved phases were "grandfathered" into regulations existing prior to the February 2019 Delaware Sediment and Stormwater Regulations.

(b) Proposed method of providing potable and, where appropriate, irrigation water and the effect on public or private water systems and groundwater, including an estimate of average and peak demands.

Phase 6 of Bay Forest Club (BFC) will be served by a potable water system supplied by Tidewater Utilities Water Company (TUI), a franchised water purveyor in the State of Delaware. All water service infrastructure design will be constructed in accordance with the Delaware Division of Public Health; Office of Drinking Water standards and specifications for public water providers. Private irrigation wells, approved by DNREC, may be used for landscape irrigation for the Community open space areas, where irrigation systems are provided.

Provisions for future water service were contemplated by TUI in the design of the water tower immediately adjacent to the former Jim's Hideaway Parcel. Provisions were previously made in the prior phases of Bay Forest Club to add a second water supply well on the BFC properties for use by TUI.

(c) Proposed means of wastewater treatment and disposal with an analysis of the effect on the quality of groundwater and surface waters, including alternative locations for on-site septic systems.

A Facilities Plan and Environmental Assessment of the Millville and Holts Landing Planning Area was prepared for Sussex County, the Final Draft dated January 2003. The Applicant / Developer of Bay Forest Club previously provided additional funding to the County to expand the study to upgrade the HLSSD from a "proposed sanitary sewer district" to a district eligible for immediate service.

The Applicant also completed, and County Engineering approved, a *Sewer Concept Plan* for the original Bay Forest Club RPC area, including provisions for providing sewer service and capacity to the current Phase 6 area. The sewage pump station constructed by the Applicant that services

the project was designed, permitted and constructed, with sufficient capacity to serve the project with the current proposed modifications to the existing RPC. The proposed infill project will eliminate the existing septic system.

(d) Analysis of the increase in traffic and the effect on the surrounding roadway system.

The Applicant has undertaken significant coordination with DelDOT representatives and complied with applicable DelDOT requirements, entering into an agreement regarding construction of the existing project entrances and off-site improvements.

The RPC modifications as proposed provide for enhanced internal road circulation / interconnection and eliminate the existing unimproved entrance to the existing Sprogell Parcel by redirecting the traffic to the existing northerly Bay Forest Club RPC Entrance at Sanderling Drive. This modification alone provides a significant improvement in public safety.

The Applicant updated the signal agreements for both the Original Bay Forest Club RPC and Infill Parcels, executing an agreement with DelDOT for the off-site road improvements. DelDOT issued a LONO for the proposed development of the parcels indicated as part of this Application based on this coordination. A copy of the LONO was forwarded to Sussex County Planning and Zoning on October 4, 2013. A copy is attached to this response as Exhibit 2. DelDOT also issued a service level evaluation response (refer to Exhibit 3) indicating that DelDOT considers the "development's traffic impact to be negligible" and "do not recommend that the applicant be required to perform a TIS". The Applicant will comply with DelDOT design standards and requirements for the final design and permitting of the on-site and off-site improvements.

(e) The presence of any endangered or threatened species listed on federal or state registers and proposed habitat protection areas.

Environmental Resources, Inc. (ERI) previously requested and obtained a clearance letter from the US Fish and Wildlife Service for the area encompassing the existing Bay Forest Club RPC and surrounding parcels addressed in this RPC modification application. No federally listed plants, animals or natural communities were noted, as shown in Exhibit 4. None are anticipated on the Phase 6 parcel. The Applicant will comply with all applicable State and Federal requirements.

No State listed resources were identified by DNREC during the PLUS review process. It is our opinion that the highly disturbed / developed condition of the existing conditions and surrounding development makes it unlikely that State or Federally listed resources will be impacted.

(f) The preservation and protection from loss of any tidal or non-tidal wetlands on the site.

A jurisdictional determination was completed by Environmental Resources, Inc. for previous phases of the Bay Forest Club RPC. The previously approved jurisdictional determination for the Bay Forest Club parcels was updated to include the Sprogell Parcel. A copy of the approved jurisdictional determination is enclosed as Exhibits 4, 4A, & 4B.

The design, as proposed, protects existing wetland resources by expansion of existing stormwater management facilities already discharging into Collins Creek. Construction is not expected to disturb any wetlands or wetland buffers.

(g) Provisions for open space as defined in § 115-4.

Provisions for community open space areas are a critical component of the design. The design for the subject parcels provides for over 40 percent of open space, exceeding the minimum Code requirements. Open space areas shown on the enclosed Master Record MR-RPC Plan enhance buffering of the more environmentally sensitive areas, provide important pedestrian linkages to the path network. Substantial enhancements have been proposed to the pedestrian connectivity in the open space network as shown in the amended plan.

(h) A description of provisions for public and private infrastructure.

The proposed parcels of Phase 6 will be connected to the existing Sussex County Wastewater treatment collection and treatment infrastructure. The water and sanitary sewer systems for existing Bay Forest Club Phase 3 and 4 were configured in the original design and constructed to service the Phase 6 area. The new on-site facilities will be designed and constructed according to County design and construction standards.

The proposed parcels will be served by a potable water system supplied by the Tidewater Utilities Water Company (TUI), a franchised water purveyor in the State of Delaware. Private irrigation wells, approved by DNREC, may be used for landscape irrigation for the Community open space areas where irrigation systems are provided.

MRA met with the Sussex County Utility Planning Department regarding the central sewer service for the proposed 23-unit development. The Phase 6 area was included in the overall Bay Forest Club sewer concept plan previously approved by Sussex County. According to the Utility Planning Department, sewer service is available and has already been extended to the subject parcel. It was determined that a Sewer Concept evaluation is not required and a Use of Existing Infrastructure agreement will be required for project approval per the attached memo (Exhibit 5) from John Ashman.

The road system within the community will be private, designed and constructed according to County Standards, and maintained by the Homeowners Association.

(i) Economic, recreational or other benefits.

Future residents of Phase 6 will become a part of the Bay Forest Club Homeowners Association and have access to the community amenities that include outdoor active and passive as well as indoor active and passive recreational opportunities. Designed as an environmentally sensitive community, some recreational activities focus on engaging the residents in exploration and enjoyment of the natural setting of Collins Creek. The existing community centers provide passive and active recreational areas. Residents will have access to canoe and kayak launching facilities for a quiet, intimate experience of tidal marsh exploration.

In addition, Phase 6 includes a centrally located and generous "village green" open space area and pedestrian paths connecting Phase 6 to the surrounding community and providing enhanced linkages between Phases 4 and 5 to the existing Community Garden amenity. The pedestrian path system also enhances the pedestrian connection between Phase 3 and the existing Community Marina Amenity Area.

Substantial environmental benefits result from the connection of the Phase 6 parcels to the existing public water and sewer infrastructure.

(j) The presence of any historic or cultural resources that are listed on the National Register of Historic Places.

There are no known historic or cultural resources, such as an archeological site or National Register listed property, on this parcel.

(k) An affirmation that the proposed application and proposed mitigation measures are in conformance with the current Sussex County Comprehensive Plan.

The Application as proposed for the Phase 6 Parcels endeavors to comply in every way with the spirit and intent of the Sussex County Comprehensive Plan.

(l) Actions to be taken by the applicant to mitigate the detrimental impacts identified relevant to Subsection B(2)(a) through (k) above and the manner by which they are consistent with the Comprehensive Plan.

A concerted effort has previously been made to retain and / or enhance the existing riparian buffer along Collins Creek throughout Phases 1-6 of Bay Forest Club to minimize fragmentation of existing potential marsh nesting bird habitat as shown on Exhibit 1. Additional, further wetland mitigation and enhancement was provided at both the Collins Creek Vehicular / Pedestrian Timber Bridge and at the onsite Marina Facility. Direct access to the waterfront area is limited to the single community marina facilities. No further impacts are anticipated as the development of Phase 6 will comply with all local and state regulations.

EXECUTIVE SUMMARY
FOR
APPLICATION FOR RE-ZONING AND MODIFICATION TO EXISTING BAY FOREST CLUB (CZ #1526, 1741, & 1795) FOR INFILL PHASE 6

(PARCEL 17.01 / APPLICATION CZ #1921)

March 15, 2021

MORRIS & RITCHIE ASSOCIATES, INC.
ARCHITECTS, ENGINEERS, PLANNERS, SURVEYORS, & LANDSCAPE ARCHITECTS

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MRA 12347X20

INTRODUCTION

On behalf of Bay Forest, LLC, we are pleased to provide the Executive Summary pursuant to a proposed modification of the previously approved Bay Forest Club RPC for infill Section Z / Phase 6. Phase 6 encompasses all of Parcel 17.01 and overlaps portions of existing Parcels 134-8.00-1071.01 & 134-8.00-15.02. This parcel is located east of Whites Neck Road (SR 347), north of the intersection of Sanderling Drive and Widgeon Drive. The current access to Parcel 134-8.00-17.01 is via Sprogell Lane; a private dirt / gravel access drive that extends to a direct connection at Whites Neck Road. The portion of Sprogell Lane and existing driveway in the Phase 6 project area will be removed as part of this infill development. Refer to the proposed site plan and site data shown on the "Amended Master Record MR-RPC Plan" attached as Exhibit 1.

The infill site is located in the area designated at the time of the application as the Environmentally Sensitive Development District Overlay Zone (ESDDOZ). The infill area surrounded by and partially overlapping existing Bay Forest Club MR-RPC. Parcel 17.01 will be fully integrated as part of the surrounding Bay Forest Club MR-RPC. The proposed unit / lot mix will consist of 15 detached 30' wide villa units and 8 attached 30' wide villa units (23 total units).

Development of the infill parcels will provide significant environmental benefits, efficient land use and full integration of the parcels into the network of existing public facilities and surrounding community. The existing land use and surrounding Bay Forest Community are shown on Exhibit 2 – "Existing Conditions".

The future development and integration of the Sprogell Parcel are shown on the "Conceptual Site Plan of Infill Parcel and Surrounding Bay Forest Club Community" attached as Exhibit 3.

The project was previously reviewed through a Delaware Office of State Planning (DEOSP) PLUS review process. Responses to the PLUS comments with supporting documentation are included with this requested zoning change from AR-1 to MR-RCP and revised layout shown in the amendment to the Bay Forest Club MR-RPC for parcels 134-8.00-17.01 & 134-8.00-15.02. The applicant also provided a detailed summary addressing all elements of the County ESDDOZ criteria in the submittal.

EXISTING CONDITIONS

Phase 6 encompasses all of Parcel 134-8.00-17.01 and overlaps portions of existing Parcels 134-8.00-1071.01 and 134-8.00-15.02. In the current condition, the site is characterized by a single-family residence with forested land utilized for livestock management purposes. The Section Z / Phase 6 area includes the entire 5.0 ac +/- Sprogell parcel and overlaps approximately 1.4 acres of the surrounding Bay Forest Club Community.

Current access to Parcel 134-8.00-17.01 is via Sprogell Lane; a private dirt / gravel road with no acceleration / deceleration lanes, sidewalks or a pedestrian connection to the surrounding area as shown on Exhibit 2. An existing stormwater management facility is located north of the site in existing Bay Forest Club Section X / Phase 5.1. The existing facility combines an extended detention wet pond and constructed wetland and will be expanded by removing the existing driveway. This facility was constructed prior to the February 2019 Delaware Sediment and Stormwater Regulations. It also part of a regional stormwater management system for the Bay Forest Club Subdivision and ultimately discharges into the tidally influenced Collins Creek.

A jurisdictional determination was completed by Environmental Resources, Inc. for the subject property and no regulated wetlands were observed. No wetland impacts are anticipated at this time. There are no flood plains in the Section Z / Phase 6 area.

PROPOSED CONDITIONS

The proposed land plan shown on Exhibit 4 fully integrates the infill area into the surrounding Bay Forest Club RPC. The proposed unit / lot mix will consist of 15 detached 30' wide villa units and 8 attached 30' wide villa units (23 total units).

The attractive streetscape along Sanderling Drive will be extended to Widgeon Road by siting the 30' wide detached villa condo units with front porches along the main entrance road with all access and rear loaded garages off extensions to the extended street network. There will be no direct access along Sanderling Road.

Landscaping along the Sanderling Road frontage will be similar to the adjacent units in Section O. The community "village green" in Phase 6 will be approximately twice the average width of the similar "village green" in adjacent Section O.

The original Bay Forest Club sewer concept plan allocated 15 EDU's to Parcel 134-8.00-17.01. Approximately 23 EDU's will be used for these parcels. The existing Bay Forest Club sewage pump station constructed by the Applicant that services the infill project area was designed, permitted and constructed, with sufficient capacity to serve the Sprogell infill modifications to the existing RPC.

Redevelopment of the Sprogell infill parcels and integration into the Bay Forest Club RPC will substantially improve water quality in Collins Creek, as documented in the ESDDOZ summary accompanying the original application.

The road system within the community will be private, designed and constructed according to County Standards, and maintained by the Homeowners Association. Residents of the infill parcels will become part of the Bay Forest Club Homeowners Association and have full access to the community recreation amenities that include outdoor active and passive as well as indoor active and passive recreational opportunities.

The Applicant updated the DelDOT signal agreements for both Bay Forest Club RPC and Infill Parcels, executing an agreement with DelDOT for the off-site road improvements. DelDOT issued a LONO for the proposed development of the parcels indicated as part of this Application.

RPC CONDITIONS

The number of units identified in Condition No. 1 of CZ # 1921 should be modified as follows to incorporate the Sprogell infill parcel:

151	85-Foot Single Family Lots
14	75-Foot Single Family Lots
216	70-Foot Single Family Lots
7	65-Foot Single Family Lots
83	28-Foot by 42-Foot Cottages
109	34-Foot Villas
356	30-Foot Villas / Townhouse
936	Total Residential Units

CONCLUSION

The Application for rezoning from AR-1 to MR - RPC and adding the Phase 6 parcels to the Bay Forest RPC endeavors to comply in every way with the spirit and intent of the Sussex County Comprehensive Plan.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS, AND LANDSCAPE ARCHITECTS

TWIN CEDARS

A Residential Planned Community

Baltimore Hundred
Sussex County, Delaware

Developed By:

Bay Developers, LLC

Prepared By:
Morris & Ritchie Associates, Inc.
18 Boulden Circle, Suite 36
New Castle, DE 19720
Phone: (302) 326-2200
Attn: Christopher J. Flathers, P.E.

April 2021

20426

T W I N C E D A R S

RESIDENTIAL PLANNED COMMUNITY INFORMATION BOOKLET
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List of Figures

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MR. DAVID C. HUTT, ESQ.

L A N D U S E D A T A

Site Data:

Location:	Southeasterly side of Zion Church Road (Route 20)
	Approx. 1,200' east of intersection with Deer Run Road (Rd 388)
	Frankford, DE
Owner:	Twin Cedars, LLC
Tax Map Parcel Number:	533-11.00-42.00
Gross Acreage:	64.32 ± acres
Current Zoning:	C-1, CR-1, & GR (Coastal Area Overlay)
Proposed Zoning:	GR - RPC
Floodplain:	Zone X – Outside of the 0.2% Annual Chance Floodplain

Land Use Breakdown

Total Lot Areas:	
Apartments:	11.62 ± Acres
Single Family:	7.82 ± Acres
Townhomes:	3.01 ± Acres
Right-of-Way:	
Public R.O.W. (DelDOT Dedication)	0.00 Acres
Private R.O.W.	4.43 ± Acres
Open Space	
Active:	1.07 ± Acres
Passive:	41.50 ± Acres
Incl. in Apartment Area	3.93 ± Acres
Incl. in Stormwater Facilities	5.31 ± Acres

Lot Compilation

	GR Zoning	**Proposed RPC**
Single Family		
Min. Lot Area:	10,000 sf	7,500 sf
Lot Width:	75 ft.	60 ft.
Lot Depth:	100 ft.	100 ft.
Front Yard Setback:	40 ft.	25 ft.
Side Yard Setback:	10 ft.	10 ft.
Rear Yard Setback	10 ft.	20 ft.

	GR Zoning	Proposed RPC
Multifamily - Townhomes		
Area:		
Minimum:	1,600 sf	2,310 sf
Average:	3,630 sf	2,940 sf
Lot Width:		
Interior Units:	16 ft.	22 ft.
End Units:	16 ft.	34 ft.
Lot Depth:	N/A	100 ft.
Front Yard Setback:	N/A	25 ft.
Rear Yard Setback:	10 ft.	10 ft.
Front / Rear Yard Aggregate:	40 ft.	35 ft.
Side Yard Setback:	20 ft.	5 ft.
Max. Building Length:	170 ft.	92 ft.
Max. D.U. / Bldg.:	8	4
Min. Bldg. Separation:	30’	26’

	GR Zoning	Proposed RPC
Multifamily Apartments		
Min. Lot Area:	3,630 sf	3,630 sf
Front Yard Setback:	40 ft.	25 ft.
Side Yard Setback:	10 ft.	10 ft.
Rear Yard Setback	10 ft.	10 ft.
Project Net Density		
GR Zoning	12.00 d.u./ac.	4.31 d.u./ac
Number of dwelling units:	771	254

I N T R O D U C T I O N

This report has been prepared at the request of Mr. Henry Mast of Bay Developers, the applicant and equitable owner of the Twin Cedars property.

The following report, including all exhibits and appendices, shall serve as supporting documentation associated with the proposed Residential Planned Community (RPC) application submitted to the Office of Planning and Zoning for the subject property on November 18, 2019.

This report will address elements of the plan, the existing conditions, the overall design concept, environmental protection provisions, open space reservations, housing types, phasing and the professional management structure for the Home Owner's Association.

An overview has been provided for the key infrastructure elements like sanitary sewer, water service, stormwater management, gas, electric, cable television, and telephone service.

Traffic and transportation impacts, as well as social and economic issues, will be discussed. This report will discuss recreation amenities, as well as, how State and County comments have been incorporated into a balanced comprehensive concept.

E X E C U T I V E S U M M A R Y

Twin Cedars is proposed as a Residential Planned Community (RPC) located on the southerly side of Zion Church Road (Route 20), approximately 1,200 feet east of the intersection with Deer Run Road (Road 388) in an unincorporated portion of Sussex County, Delaware. The 64.32-acre site is located entirely within the Coastal Area, formerly referred to as the Environmentally Sensitive Development District Overlay Zone, as shown on the Sussex County Comprehensive Plan dated March 2019. Design and development concepts for Twin Cedars focused on creating a pedestrian friendly community of single-family, townhome, and apartment dwellings clustered around a centrally located community recreation area. The project site includes more than 42 acres of open space, with each of the residential lots connecting directly to open space. It is anticipated that the infrastructure for Twin Cedars will be constructed over a 2-year period, with residential construction taking approximately 4 years to complete.

The community recreation area is anticipated to include a community clubhouse building and outdoor pool and patio area. Sidewalks will be provided throughout the community along both sides of the vehicular thoroughfares to connect the residences to the community clubhouse area.

The majority of the development area was previously utilized for residential purposes (former apartment complex) and/or used for agricultural purposes. Due to high groundwater conditions anticipated on site, extended detention stormwater practices including wet ponds and/or created wetlands will be implemented to provide runoff management. Utilization of these facilities will provide a reduction in both runoff and nutrients (i.e. nitrogen, phosphorus) from the developed site.

The Twin Cedars site is currently located within Sussex County's Johnson Corner Sanitary Sewer District and will utilize extensions to the existing County infrastructure to provide public sewer to the site. The on-site gravity system is anticipated to connect directly to existing mains located along the Zion Church Road without the need for construction of an additional sanitary sewer pump station. The site is also located within an existing Certificate of Public Convenience and Necessity (CPCN) service area designated to Tidewater Utilities Inc. (TUI). Existing TUI distribution mains area located along the Zion Church Road and are anticipated to have adequate capacity to service the Twin Cedars site.

Forested and/or landscaped buffer areas will be provided around the perimeter of the community in accordance with Section 99-5 of the Sussex County Code. The internal subdivision street system will be designed and constructed in accordance with Sussex County standards and will be privately owned and maintained upon completion. Consideration for pedestrian safety and convenience through traffic calming design techniques, sidewalks; unified street signage and lighting standards will be incorporated into the final design of the project.

Twin Cedars is anticipated to provide a vibrant community, with social and recreational benefits to the residents, economic benefits to the County and surrounding areas, while minimizing environmental impacts to the existing on-site resources and the neighboring properties.

Existing Conditions

Location

The Twin Cedars site is located in southeastern Sussex County, approximately 1,200 feet south of the intersection of Zion Church Road (Route 20) and Deer Run Road (Road 388). The project site is comprised of one existing parcel, referenced on District 533, Map 11, as Parcel 42.00. As shown on the current Sussex County Comprehensive plan, the entire project is located within the Coastal Area growth zone. Portions of the subject lands along Zion Church Road are currently zoned General Commercial (C-1) and Commercial Residential (CR-1) while the remaining portion of the site is zoned General Residential (GR).

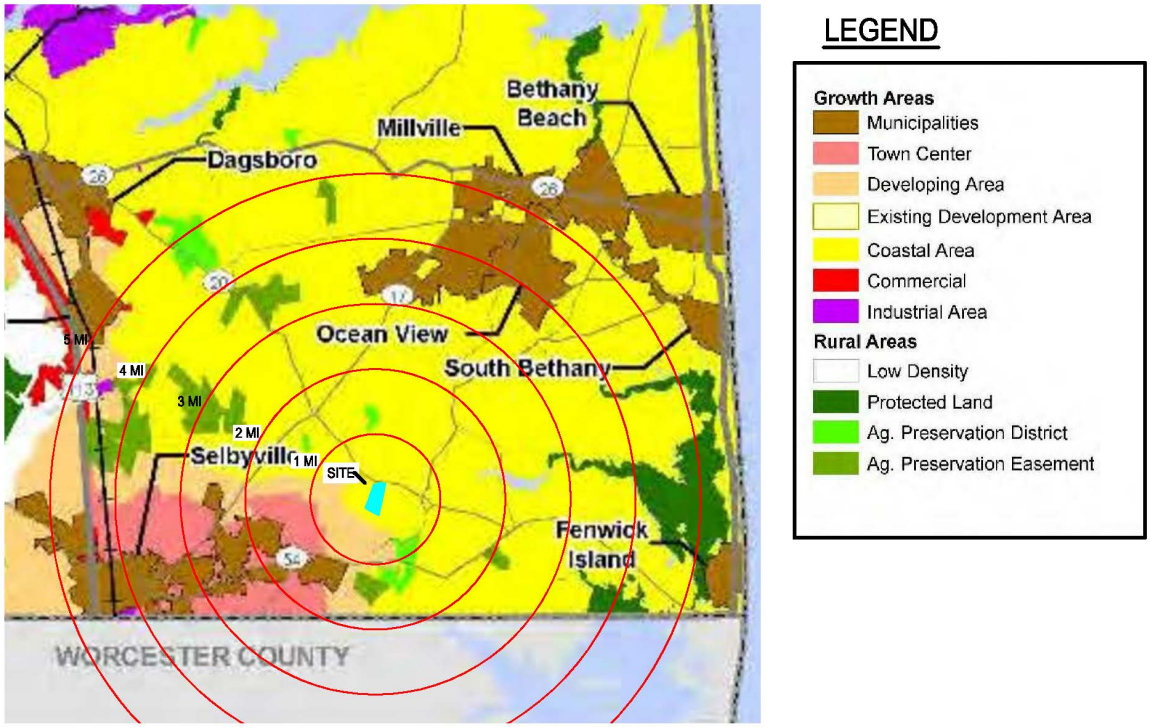

Figure 1 - Future Land Use Map

Existing Land Use

The 64.32-acre parcel is currently owned by Twin Cedars, LLC. Although a portion of the site was previously utilized for apartments, the structures were previously demolished. A portion of the rear parcel area is currently utilized for agricultural purposes and a small support structure still remains within the parcel areas. There are however, no historic structures located within the project area. The subject site is bordered to the west by the Hampden Park residential subdivision, to the southeast by the “Lost Lands RV Park, and to the southwest and east by undeveloped parcels currently utilized for agricultural purposes.

The southerly portion of the site contains a large wooded area; limited clearing and disturbance is anticipated to this area of the site as a result of the proposed design. A wetlands evaluation was completed by Geo-Technology Associates, Inc. (GTA) in March 2021. Based upon this review and as shown in the applications submitted to DNREC and the Army Corps of Engineers (ACOE), no jurisdictional wetlands or Waters of the US were identified within the limits of the subject project area in the professional opinion of GTA. No disturbance to jurisdictional wetland areas are anticipated as a result of the proposed development. Review of the FEMA floodplain maps reveal the subject parcel to be located within Zone X, outside of the 0.2% annual chance floodplain.

The project area is gently sloping from west to east and from the frontage on Zion Church Road into the site area. Drainage is directed to existing on-site drainage ditches and tax diches. A portion of the Batson Branch, Prong 1 tax ditch traverses the front portion of the site, and the upper end of Batson Branch, Sub 2, Prong 1 runs along the easterly property boundary. These features are anticipated to continue to convey the runoff from the developed property off-site. Any modifications to the tax ditches or associated rights-of-way will be performed with approval of the Tax Ditch managers and DNREC approval. No portions of the site are located within an excellent groundwater recharge area.

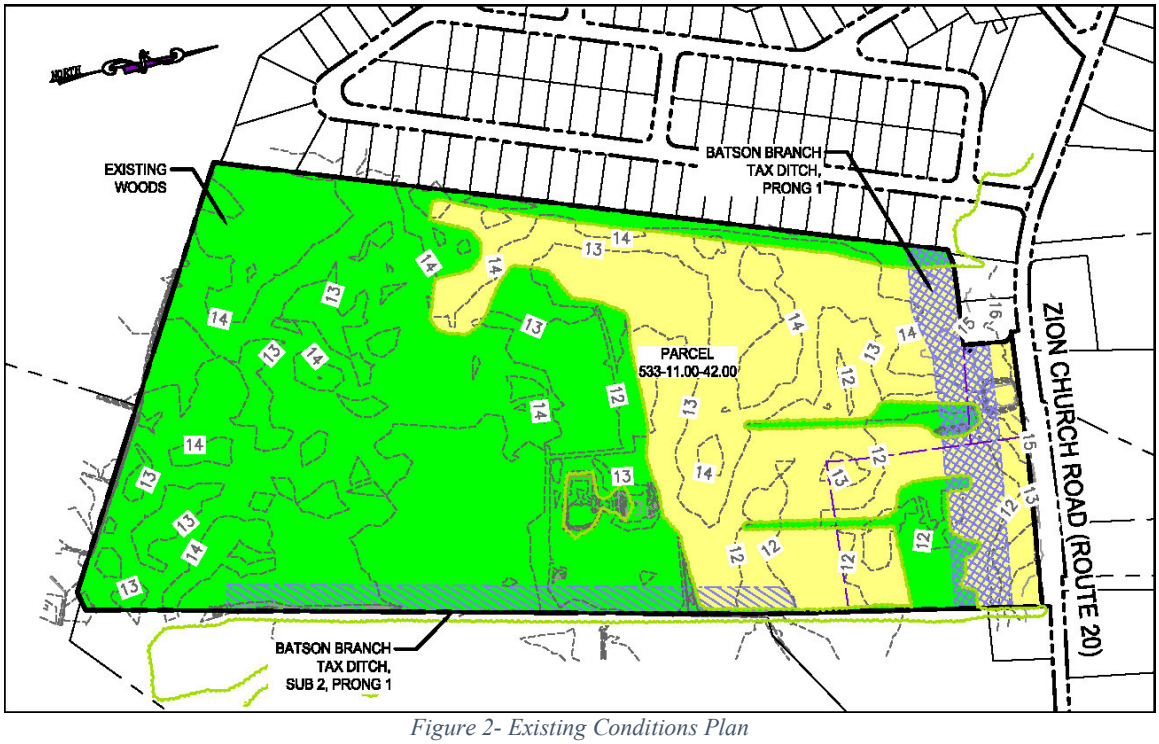

Figure 2- Existing Conditions Plan

According to the United States Department of Agriculture (USDA) Soil Survey for Sussex County, Delaware (September 14, 2018), the site is primarily underlain by the Hurlock loamy sand and Mullica-Berryland. Both of these series typically consist of poorly drained soils with loamy sand and sandy substrata.

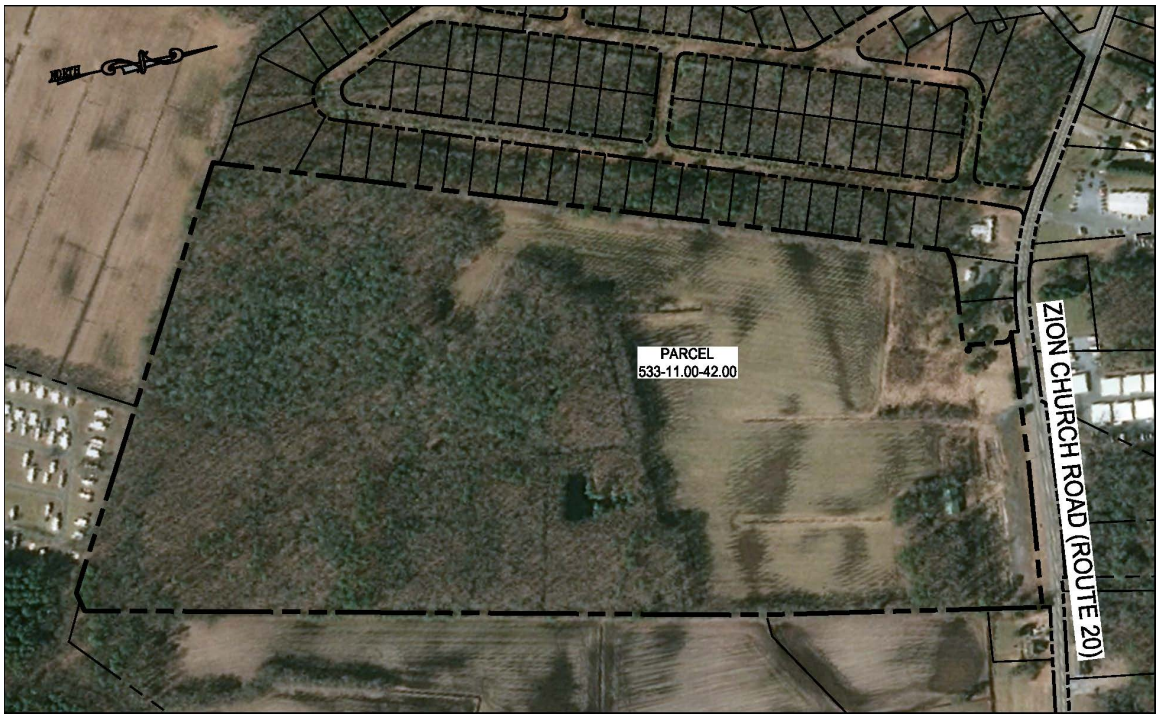

Figure 3 - Aerial Orthophoto

Figures 3 and 4, provide insight into the project and the surrounding area. As shown in the aerial image of the site, the Hampden Park subdivision can be seen immediately to the west of the project site and the RV-park is apparent along the southeasterly corner of the property boundary. A wider, regional examination of the area shows the Twin Cedars site in proximity to several other residential developments. Along the Route 20 corridor are the subdivisions of Deer Run Acres, Hampden Park, Fox Haven, Sweet Bay, Ashton Oaks, Batons Creek Estates, Swann Estates, and the Hamlet at Dirickson Pond. To the southwest, along the Route 54 are Lighthouse Lakes, Saltwater Landing, and Atlantic Lakes on the approach towards the Town of Selbyville.

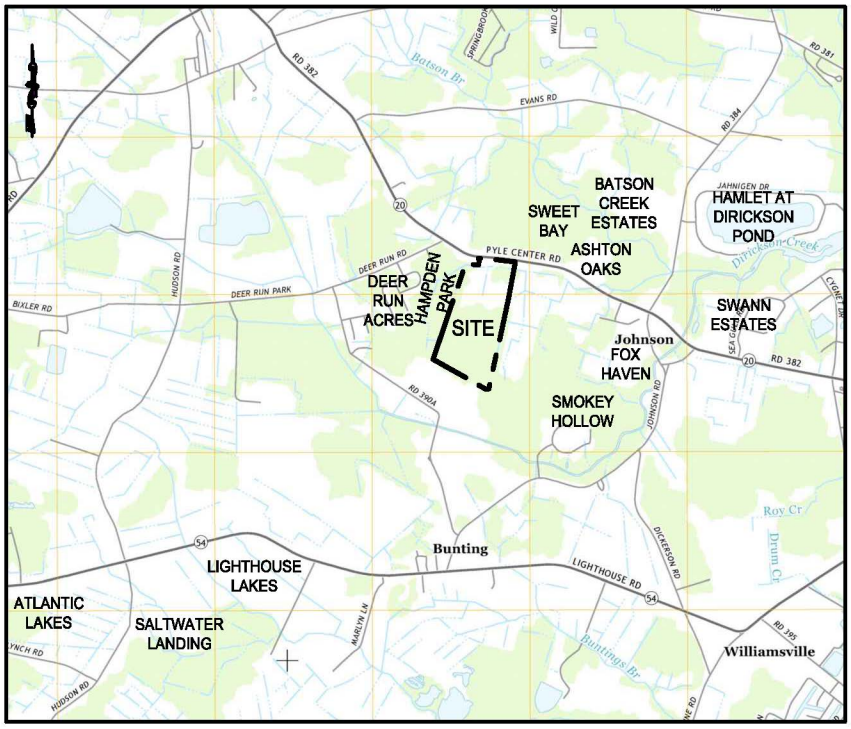

Figure 4- Adjacent Developments

In general, Twin Cedars is comparable to the surrounding uses as a mixed use residential project and has a gross density commensurate with a site within the Coastal Area growth zone. For this reason, this land should be utilized to the fullest extent, while not exceeding allowable density of the underlying C-1 and GR zonings for sites serviced by public sewer.

Residential Planned Community Concept

The primary purpose of the Residential Planned Community (RPC) development concept is to "encourage large-scale development as a means of creating a superior living environment through unified developments, and to provide for the application of design ingenuity while protecting existing and future developments and achieving the goals of the Comprehensive Plan.

The design vision and development concept for Twin Cedars was intended to create a sense of community with a focus on the centrally located amenities, while maintaining a connection to the open space. The design process used to achieve this vision is listed below and was the basis for the layout and various elements used in the plan.

- **Create** a "sense of place" around an open space concept on a site with limited natural features.
- **Define** a perimeter buffer.
- **Connect** lots to open space area and central amenity.
- **Centralize** development around open space areas and central amenity feature

The Twin Cedars site is being developed by Bay Developers, LLC as a proposed Residential Planned Community with an underlying GR zoning district. The plan proposes to rezone the existing CR-1 and C-1 portions of the site to GR to eliminate the split zoning of the subject parcel. Located entirely within the Coastal Area growth zone, and with public water and sewer readily available at the site, the implementation of the RPC development option will allow for smaller lot sizes and clustering of the development area for an efficient land plan to maximize preservation of existing natural areas and passive open space.

By implementing the mixed-use approach and smaller lot sizes afforded by the creation of the RPC, a development like Twin Cedars is able to provide an enhanced sense of community within the subdivision by reducing distance between neighbors and providing meaningful active open space and gathering areas. Roads and utilities can be designed in a more efficient manner that lower infrastructure construction requirements for both initial installation and long-term maintenance.

The Site Data summary and illustrative site plan, figure 5, depicts the overall design concept and the major features of the RPC. It should be noted, that utilization of the smaller lot sizes, and clustering effect, has resulted in an ability to retain a large area of natural wooded area on the rear portion of the site. Perimeter buffer areas, and interior open space pockets have been provided so that more than 90% of the single-family and townhome lots have a direct connection to open space.

Figure 5 - Illustrative Site Plan

Site Data:

Total Lot Area:		64.32 Acres
Current Zoning District		C-1, CR-1, & GR (Coastal Area Overlay)
Proposed Zoning District		GR - RPC
GR District minimum Lot Area		
		Single Family - 10,000 SF Multifamily Townhouse – 1,600 SF Multifamily Apartment – 3,630 SF
RPC District Minimum Lot Area		
		Single Family - 7,500 SF Multifamily Townhouse – 2,310 SF Multifamily Apartment – 3,630 SF
Allowable Density GR Zoning: (64.32 ac. – 4.43 Ac) x (12.00 d.u../ac.)		718 Dwelling Units
Proposed Number of Units		254 Dwelling Units
Area of Proposed Streets		4.43 Acres
Public R.O.W. (DelDOT Dedication)		0.0 Acres
Private R.O.W.		4.43 Acres
Proposed Gross Density		4.31 D.U. / Acre
Open Space Required (10%)		6.43 Acres
Open Space Proposed (65%)		42.12 Acres
Active Open Space / Clubhouse Area		1.07 Acres
Passive Open Space		41.05 Acres
Incl. Stormwater Facilities		5.31 Acres

Off Street Parking

	Required	Proposed
Single-Family Detached (2 Spaces / Unit)	84 spaces	84 spaces
Multifamily Attached – Townhomes (2 Spaces / Unit)	88 spaces	88 spaces
Multifamily Apartments (2 Spaces / Unit)	336 spaces	337 spaces
Community Center / Overflow	N/A	33 spaces

Infrastructure	
Sewer	Sussex County
Water	Tidewater Utilities

Clustering to Create a Sense of Place

The design concept for Twin Cedars was to look initially at a way of utilizing the RPC ordinance and clustering concept to provide a meaningful use of open space, provide community buffering, and create a network of roads and pedestrian pathways to link the residential areas and community amenities together. The focus was on creating a sense of community where residents and visitors could interact as they drive, walk, sit and relax. This goal will be achieved by creating a centralized amenity where the residents can gather.

The primary structuring element of this design is the road network and associated pedestrian sidewalks. The amenity area has been centrally located, with all of the internal streets linking back to this central area.

The site, in its current condition, has considerable environmental areas at the rear of the property as noted above. A majority of the existing natural areas will be preserved in an undisturbed state; while others will be enhanced and expanded to provide additional backdrop for the community. Providing a centralized amenity provides a welcoming element to the community while also providing a point of destination for the residents. The amenity area combines with the axial open space element of the community to provide a visual and physical connection along the longitudinal axis of the site as shown by the Design Concept sketch below.

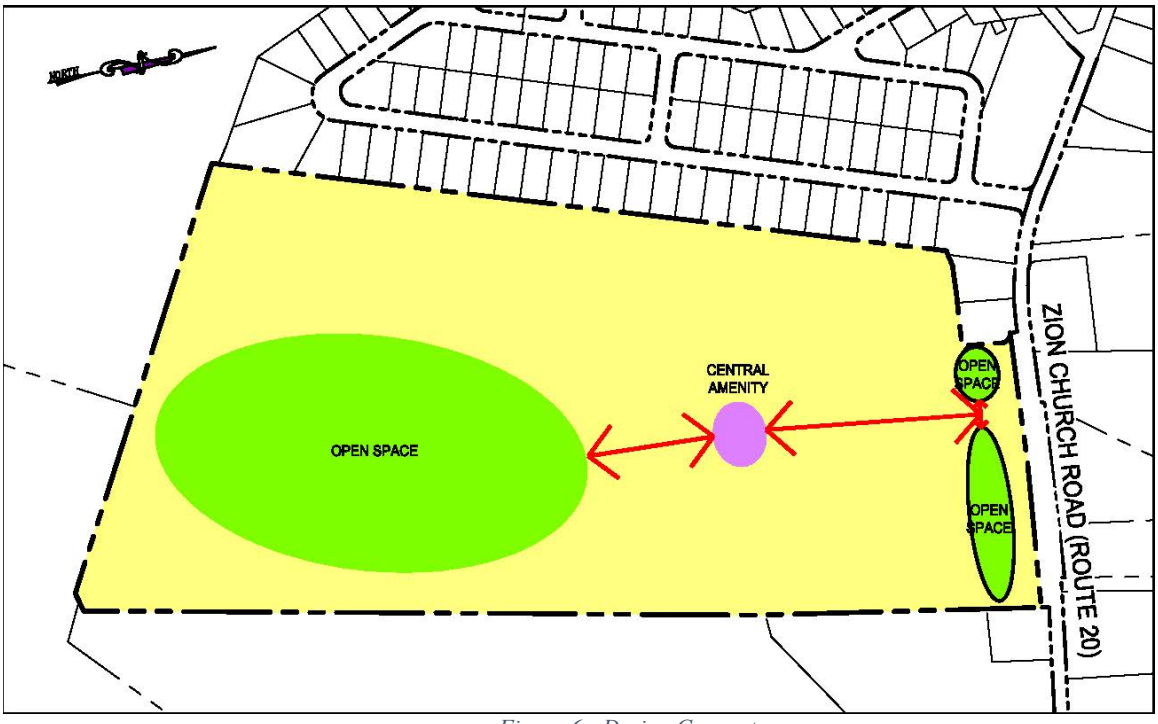

Figure 6 - Design Concept

Perimeter Buffer

The design concept for Twin Cedars Glen begins to take form by defining a perimeter buffer around the project area, with a single point of access from Zion Church Road. The expanded front buffer area provided for the apartment area will incorporate

landscape screening as well as provide an area for stormwater management for the developed site. Placing these facilities within a buffer area will further allow for the efficient use of the developed site.

All residential lots and apartment areas will have access from the interior subdivision streets; no proposed lots will have direct access to the adjacent state road (Zion Church Road). A perimeter buffer has been provided that will vary in width from 20' to more than 1260' around the site. These buffer areas will be comprised of a mixture of forested buffers, which will retain the existing natural vegetation, and vegetated buffers that will be planted with a mixture of deciduous and evergreen planting materials in accordance with the County Code. The perimeter vegetated buffers will include undulating landscape berms where feasible to provide enhanced screening between the project site and the adjacent areas. Proposed planting materials will include native and improved plant varieties to provide for visual interest and minimize landscaping maintenance requirements.

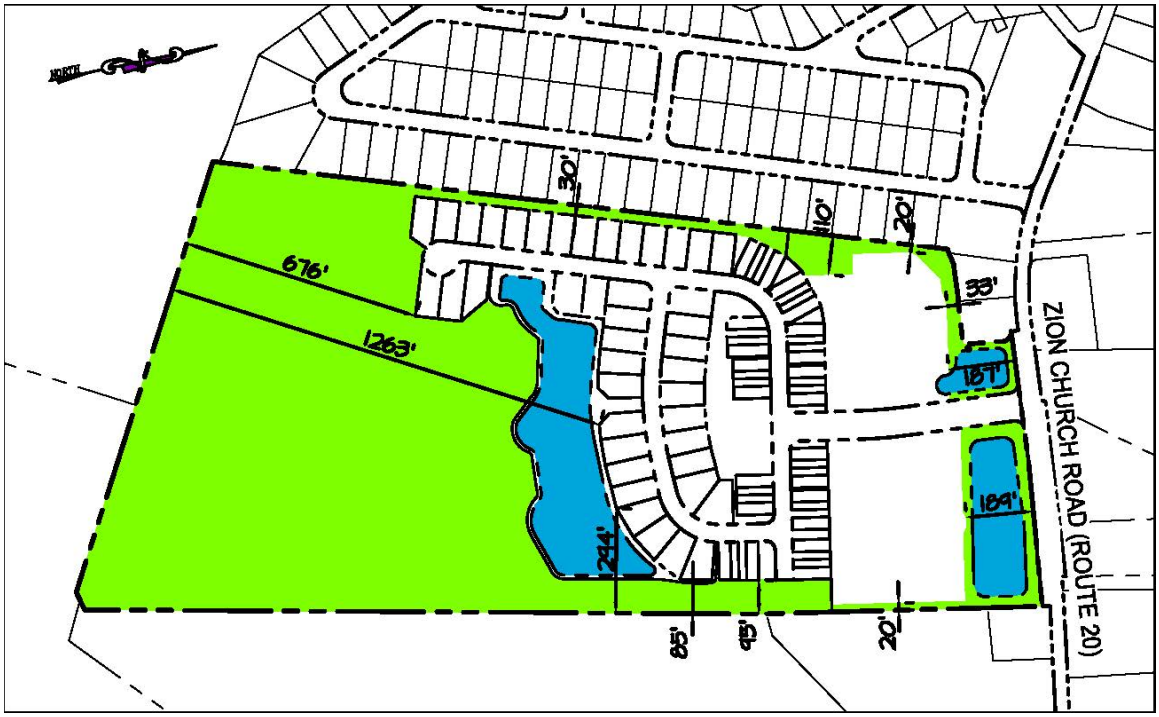

Figure 7 - Perimeter Buffer

In addition to providing enhanced screening, the landscaping will help to direct residential interaction toward the internal portions of the sites and the centrally located amenities. The landscape buffers and berms, as shown in the figure below, will reduce the visual impact of the change in use from agricultural to residential use, promoting the concept of open space preservation.

Figure 8 - Landscape Berms

Open Space & Unifying Element

The key elements for the site design are the direct connections of the lots to the surrounding open space areas and the direct pedestrian linkage to the centrally located amenities. The axial formation of the site reinforces these connections. The primary central amenity and anchor for the development is the community center that is anticipated to include a multipurpose building with outdoor pool, patio areas, playground, and centralized mail kiosk.

Figure 9 - Unifying Elements

Central Amenity Feature

The core open space and recreation system for Twin Cedars is designed as an integral part of the road system and lot configuration. Located at the terminus of the main entrance road, this amenity is a focal point of the community. Careful attention was given to balance the active open space areas with the passive areas provided for perimeter buffering, lot configuration, and preservation of natural areas.

Figure 10 - Community Clubhouse Concept

The central amenity feature for Twin Cedars is the 1.5 acre community center complex. The community center is anticipated to include a community building, outdoor pool and patio area, as well as a playground. The building will likely include gathering spaces, game or fitness rooms, restroom / locker facilities, and a kitchen. This will allow the facility to accommodate a wide range of activities, from fitness and aerobics, card games, art classes, and gathering with neighbors. Administrative rooms and a large meeting space may be provided to accommodate meetings of the homeowner's association and other community events.

More than 96% of the dwelling units are located within a 700' radius of community clubhouse. Thirteen off street parking spaces are to be provided in parking bays immediately adjacent to the community center facilities. It is anticipated that most residents will walk to this central location reducing vehicular trips and the need for additional off street parking. Bicycle racks will also be provided for residents utilizing an alternative method of transportation.

The community center will be linked to all other portions of the community through the interior subdivision streets. Sidewalks will be provided on both sides of all streets to and within the apartment parking areas to accommodate and encourage pedestrian movement throughout the community.

Construction Phasing

The 254 new dwelling units are anticipated to be constructed over a multi-year period. Given the mixture of multiple dwelling types, it is anticipated that the full buildout of the community may be completed within three years.

Figure 11 - Conceptual Construction Phasing

For purposes of construction, the development will likely be broken down into four phases. The initial phase will include the site entrance, the construction of entrance road, the apartment area located on the easterly portion of the site, and associated stormwater management areas. Phase 2 will include approximately 41 single family and townhome dwelling units, the community amenities, and the associated road and stormwater management areas. Phase 3 will include the remaining 45 single family and townhome dwelling units and remaining private road areas. The final area of construction will include the remaining apartment area located on the westerly portion of the site. Final phasing limits and limits of construction are subject to final engineering, cost effective construction sequencing, and market demand. Amenities will be constructed as each related phase is completed.

Homeowner's Association Organization and Management Structure

Governing Documents

Twin Cedars will be formally created and governed by a series of governing documents. There will be Articles of Incorporation to establish the master community as a corporate entity. There will be a Declaration of Covenants, Conditions and Restrictions which outline the restrictive covenants governing the community, and Bylaws which

address the community operation, and the Architectural Guidelines which address architectural control. The Twin Cedars Homeowner's Association (TCHOA) will operate and maintain the common facilities in the subdivision, including open spaces, stormwater management facilities, private roadways, and recreation facilities. The ownership entity of the apartment area will be responsible for the parking lots, building, and areas located within the two apartment lot areas.

Articles of Incorporation

The Articles of Incorporation will establish the master community as a corporate entity. The association that will oversee the management, operation and maintenance of the community will be a non-stock corporation.

Declaration

The Declaration will outline the restrictive covenants governing the community and shall be recorded among the Land Records as permanent covenants which run with the land. The Declaration creates the Residential Planned Community. It will outline in detail the role and responsibility of the Declarant. It will establish the obligation of the owners of the various lots and units to pay assessments for the maintenance, repair and replacement of the common area, amenities, and facilities and will provide the authority of record liens, after providing reasonable notice, for the non-payment of such assessments. The Declaration will also establish use restrictions for the residential units, establish use restrictions regarding the common areas and amenities, and generally outline the architectural control requirements and the enforcement authorities of the Community regarding the covenants.

Bylaws

The Bylaws will outline the governance of the Community. The Community will be governed by an Executive Board, which will be controlled by the Declarant during construction, until turnover to the Community. At such time, the Executive Board will be elected by the residents and owners within the community. The Bylaws will address the powers and duties of the Executive Board and will further address the day-to-day management, operation, and maintenance of the Community and the mechanisms by which the same are accomplished. The Bylaws will require the Community to retain a professional property management company to ensure that the Community and its common areas, amenities and facilities are properly managed and maintained.

Architectural Guidelines

Architectural Guidelines will also be part of the governing documents of the Community. These guidelines will set specific architectural styles, colors, and materials for the construction of the residential units as well as the common elements of construction. The guidelines will specifically address house placement requirement as well as the placement of any accessory structures including, but not limited to garages, sheds, and outdoor shower areas. These guidelines will establish setback requirements for construction. The Architectural Guidelines will create a review committee to review and determine compliance, or lack thereof of new construction, as well as modification of existing construction. It is the intent that construction, including new construction and

construction of modifications, will not be authorized unless and until the review committee has issued a permit for construction within Twin Cedars. This permit procedure is intended to ensure compliance with the governing documents, and in particular the Architectural Guidelines. The Declarant intends to maintain control of the review committee until new construction is completed within the Community. Upon completion of new construction, control shall be relinquished to the Executive Board's appointees or elected representatives for review of proposed modifications.

Development Infrastructure

Sanitary Sewer Service

The Twin Cedars site is located within the existing boundary of the Sussex County Johnson Corner Sanitary Sewer District (JCSSD). Sanitary sewer service will be provided by the Sussex County Department of Public Works.

A public sewer system will be proposed to service the Twin Cedars community. This system will be comprised of an internal gravity sewer collection system with a direct connection to the County interceptor located along Zion Church Road.

A Sanitary Sewer Concept Evaluation (SSCE) was performed by the Sussex County Engineering Department on September 23, 2019. The conclusions of this report confirmed that the project site is located within a Tier 1 Sewer District Area. As noted by the SSCE, the proposed sewer system will be connected to the existing County facilities in the vicinity of JC-110 or JC-111. A Use of Existing Infrastructure Agreement will be required for the project and executed prior to recordation of the project.

Domestic Water Service

The Twin Cedars subdivision will have a potable water system supplied by Artesian Water Company, Inc. (AWC), a franchised water purveyor in the State of Delaware. All water service infrastructure design will be in accordance with the water provider's standards and adhere to the requirements of Department of Natural Resources and Environmental Control for public water supply. Easements will be provided for the benefit of AWC throughout the project area for the operation and maintenance of the water system.

The average daily domestic water demand for Twin Cedars is estimated to be 46,000 gallons per day for the proposed 42 single-family, 44 townhomes, 168 apartments, and community center amenities. The maximum day demand is estimated to be 96,000 gallons per day. Water supply will be provided from the existing AWC supply sources. The on-site water distribution system will connect to the existing AWC water distribution main located along the property frontage on Zion Church Road.

Fire Protection

The water system will be designed in accordance with the Delaware State Fire Prevention Regulations. Fire flow will meet, or exceed, the minimum flow required for fire protection of single-family detached residential homes, townhomes, and apartments. Fire

hydrants will be provided throughout the community along the road rights-of-way, with hydrant spacing of 800 feet or less on center in accordance with the State Fire Code.

Sediment and Stormwater Control

The overall Twin Cedars site is located on approximately 64 acres, located within the watershed of the Inland Bays. The purpose of this stormwater management narrative is to describe how the qualitative and quantitative stormwater management requirements will be met at this site.

The Twin Cedars site has been designed to utilize “low impact development” techniques, including clustering and use both structural and non-structural SWM practices. By reducing the footprint of the development area, the area disturbed by construction of the proposed subdivision will be approximately 35 acres of the development site. These measures will help to increase open space, reduce impervious area, and reduce runoff from the developed site.

Temporary construction stormwater / erosion and sediment controls will be implemented to mitigate discharge of sediment laden waters offsite during the construction phase of the project. Permanent post-construction stormwater management will be utilized to ensure that peak runoff rates of the developed conditions do not exceed the pre-developed levels. Stormwater infiltration and slow-release practices will be designed in accordance with current DNREC regulations to address the increase in runoff volume associated with the Resource Protection Event Volume (RPv). Erosion and sediment control / stormwater management plans will be submitted to Sussex Conservation District (SCD) for review and approval.

A pre-submittal meeting will be held with SCD staff to discuss general drainage issues within the watershed and overall stormwater approach for the developed site. Due to high groundwater conditions on the site, it is anticipated that extended detention wet ponds facilities will be provided as the primary SWM practice. Additional infiltration based facilities may be implemented where feasible.

Other Utilities

Twin Cedars will be served by the following utility companies:

Natural Gas	Chesapeake Utilities
Electric	Delmarva Power
Telephone	Verizon
Cable / Internet /	Comcast

Traffic & Transportation

Traffic Impact Study

The proposed Twin Cedars community will generate an estimated 2,030 daily vehicle trips on the surrounding roadways as a result of the proposed 42 single-family and 212 multi-family (townhome and apartment) dwelling units. As part of the RPC application, a Service Level Evaluation was performed by DelDOT. Per the results of the DelDOT analysis, the developer was recommended to conduct a Traffic Impact Study

(TIS). A TIS was prepared by The Traffic Group (TTG) and submitted to DelDOT for review. DelDOT subsequently issued a letter of approval for the TIS on July 13, 2020.

Roadway Improvements

Based upon findings of the TIS, it was recommended that the developer will construct one site entrance to access the project from Zion Church Road; this entrance will be designed and constructed in accordance with current DelDOT standards. Additionally, the developer is anticipated to will participate in a signal agreement for the future construction of a traffic signal at the intersection of Zion Church Road (Route 20) and Bayard Road / Johnson Road, through an equitable share contribution. Requirements for all off-site transportation improvements will be noted on the Record Plans for the project prior to recordation.

Subdivision Streets

All streets within the Twin Cedars development will be privately owned and maintained. The private streets will be designed and constructed in accordance with the requirements of the Sussex County Code. A single point of access will be provided from Zion Church Road, and a future interconnection point has been provided to the adjacent undeveloped parcel located to the southeast of the project site.

A closed section roadway will be utilized throughout the development to ensure pedestrian and vehicular safety and provide an enjoyable driving experience. Street lighting and street trees will be provided in accordance with the Sussex County Code to reinforce the streetscape and pedestrian pathways. All internal streets will be owned and maintained by the developer during construction and conveyed to the Twin Cedars Homeowner's Association upon completion of the project.

Multimodal Transportation

Twin Cedars was designed to promote non-vehicular trips within the residential community. By placing the community amenity space in a centralized location, the residents of the community are able to easily access the site. These facilities will only be provided for the benefit of the residents of the community and will not be utilized by the outside public.

Each of the internal subdivision streets will have sidewalks on both sides to encourage pedestrian movement throughout the subdivision. A shared use path will be incorporated into the project frontage on Zion Church Road to provide linkage to the surrounding area.

Emergency Evacuation

In the event of emergency evacuation the residents will have been informed through Community documents of the procedures for preparing for evacuation. Part of that documentation shall include the Sussex County Storm Readiness Plan and Delaware Emergency Management Association (DEMA) Disaster Preparedness Plan. The anticipated evacuation routes, shown below, are based on the DelDOT established evacuation routes. Signage will be posted at the site entrance in accordance with DelDOT requirements for evacuation routes.

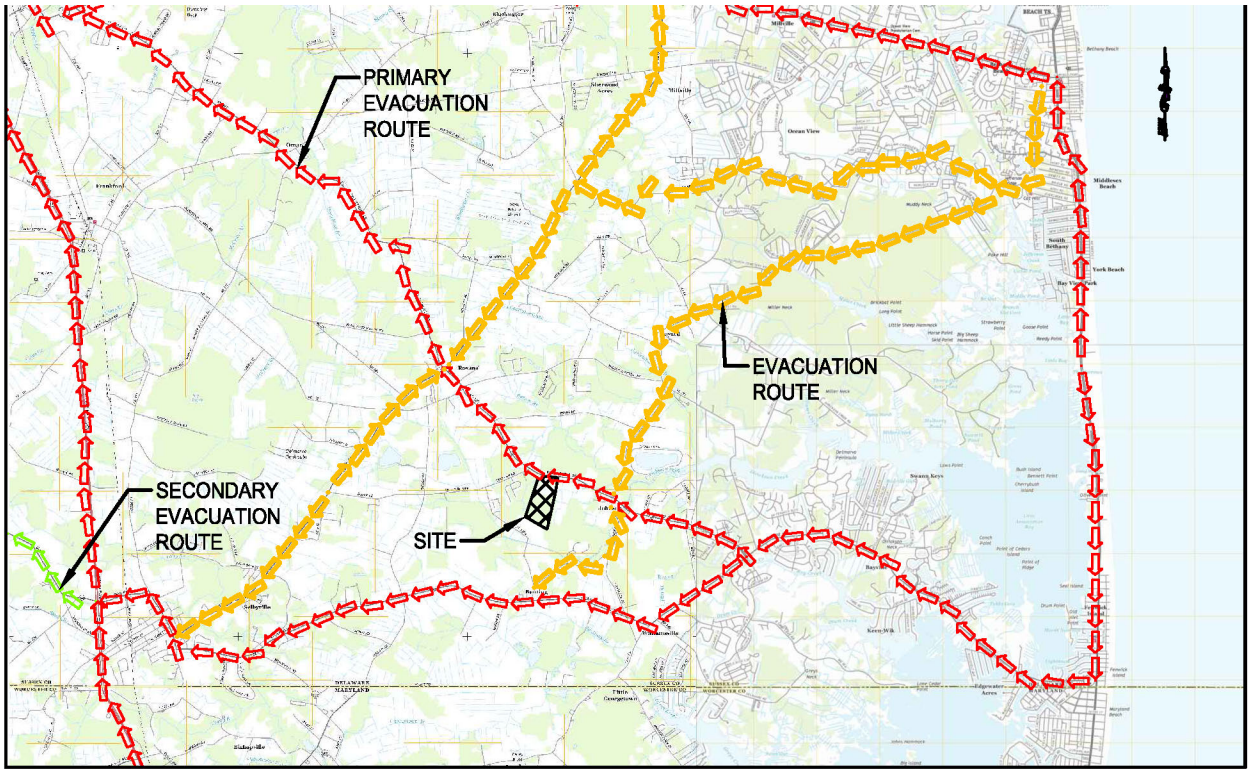

Figure 12 - Evacuation Routes

Social Influences

The Twin Cedars community will have an effect on local services including Fire Company, Police Department and School system.

Fire and Rescue

The Roxana Volunteer Fire Company (RVFC) 90, Station 1, has the primary responsibility for providing fire and emergency medical services within the proposed Twin Cedars area. Other nearby fire and rescue companies include the RVFC Station 2, the Frankford Volunteer Fire Company at Station 76, and the Millsboro Volunteer Fire Company at Station 83.

These companies provide:

- Firefighting
- Hazardous Material Response
- ALS Emergency Medical Service
- Vehicle Rescue (Extrication)
- Search & Rescue

The Sussex County Para-Medics provide additional service in this area for advanced life support. The Twin Cedars subdivision would be covered by Station 105 in

the Frankford area. These facilities are open and operating twenty-four hours a day, seven days a week, and are support and back-up to the Fire Company in the event of emergencies.

Police and Security

The Delaware State Police Troop 4 out of Georgetown has the primary jurisdiction for servicing the proposed Twin Cedars community. The Troop is responsible for enforcement of traffic laws, parking regulations, and state laws.

Schools

The Twin Cedars site is located within the Indian River School District (IRSD). Based on similar projects within the area, an estimate of one student per 6 dwelling units may be anticipated as a result of this project. The proposed 254 units would therefore result in an increase of approximately 43 students being introduced to the IRSD. It is anticipated that the children of Twin Cedars would attend Showell Elementary School, Selbyville Middle School, and Indian River High School based on current distribution patterns within the district.

During the approval process the Developer will coordinate with the school district to confirm assigned schools, and determine appropriate bus stop locations.

A majority of the annual property taxes received from each lot, as well as a significant state contribution from income tax receipts will go to support the school system. The annual taxes generated from this development should support and surpass the few resident children who will utilize the educations resources of the area.

Economic Impacts

Anticipated Revenue Enhancements to Sussex County

One time fees:		
1. Transfer Taxes (1.5% Sussex County & 2.5% State)		
a. Sale of property to developer (estimated)	$	120,000
b. Sale of lots to builders (estimated)		
i. Single-family	$	126,000
ii. Townhomes	$	99,000
iii. Apartments	$	252,000
c. Sale of finished homes (estimated)		
i. Single-family	$	472,500
ii. Townhomes	$	369,600
Total transfer tax revenue	$	1,106,460
2. Sewer Impact Fees		
254 units @ $6,360 per unit	$	1,615,440
3. Building Permit Fees (estimated)		
a. Single Family – 42 units @ $750 per unit	$	31,500
b. Townhomes – 44 units @$750 per unit	$	33,000
c. Apartments – 7 buildings @ $7,500 building	$	52,500
Total Building Permit Fee Revenue	$	117,000
Total one-time fee & taxes	$	2,838,900
Annual Property taxes (estimated)		
1. Single Family - 42 @ $1,500 per unit	$	63,000
2. Townhomes – 44 @ $1,125 per unit	$	49,500
3. Apartments – 7 @ $18,000 per building	$	1,260,000
Total Annual Property Tax Revenue	$	1,372,500

A P P E N D I C E S

Appendix 1 – 99-9C Compliance

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Sussex County Code Chapter 99-9C Compliance

for

Twin Cedars

Baltimore Hundred
Sussex County, Delaware

Prepared By:
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April 2021

SUSSEX COUNTY CODE
CHAPTER 99-9C COMPLIANCE

It is the intent of this submittal to demonstrate how the proposed Twin Cedars project meets, or exceeds, the regulatory requirements and follows the County growth objectives with regard to the Sussex County Code and Ordinances.

Located within the C-1, CR-1, and GR Zoning Districts, the proposed Residential Planned Community of Twin Cedars will include mixture of single family detached and multifamily apartments and townhomes. Based upon an overall site area of 64+/- acres, the resulting gross density of the proposed project will be 4.31 dwelling units per acre. The project proposes to rezone the C-1 and CR-1 portions of the site to GR to eliminate the existing split zoning of the subject parcel. The Residential Planned Community ordinance will be applied to the overall GR zoned site area in an effort to efficiently utilize the available land areas, and promote a greater amount of preserved and usable open space areas within the project site.

All infrastructure for the development (both on-site and off-site), will be designed and constructed at the developer's expense. The infrastructure will include roads, sidewalks, lighting within the project, off-site road improvements along road frontage, stormwater management, on-site sewer collection and transmission, on-site water distribution, and on-site community recreation facilities.

Water and sewer will both be centralized public systems. Water service for the community will be provided by Artesian Water Company, Inc. (AWC). All water distribution will be designed to requirements of the State Fire Marshal's Office and DNREC and constructed in accordance with AWC standards. Sanitary sewer service for the community will be provided by Sussex County. All sanitary sewer systems will be designed in accordance with State and County requirements and constructed in accordance with Sussex County standards.

The Twin Cedars community is proposed to be developed as combination of market rate single-family and multifamily dwelling units. The multifamily apartments will be market rate rental units owned and operated under one ownership.

The information below is provided to address the requirements of Chapter 99-9C of the Sussex County Code:

1. *Integration of the proposed subdivision into the existing terrain and surrounding landscape.*

   The proposed development area is planned primarily within the previously cleared limits of the parcel previously utilized for agricultural and residential areas. The proposed development is anticipated to result in minimal clearing of existing wooded areas on the site. Landscape buffers have been proposed around the entire perimeter of the site to provide buffering to the adjacent residential land uses. Proposed site grading is anticipated to maintain overall drainage patterns of the existing condition.

2. *Minimal use of wetlands and floodplains.*

   A Wetlands Report was prepared by Geo-Technology Associates, Inc. (GTA) for the project site in March 2021. Based upon this investigation, it was determined that no jurisdictional wetlands or "Waters of the U.S" were identified within the limits of the subject project area in the professional opinion of GTA. Additionally, no tidal-wetlands are located within the project area. Requests for Jurisdictional Determination have been submitted to DNREC and ACOE for confirmation of these findings. Based upon the GTA delineation, no impact to regulated wetlands are anticipated as a result of this project.

   Review of the FEMA floodplain maps indicate that the entirety of the parcel is located within the limits of Zone X, identified as "areas determined to be outside the 0.2% annual chance floodplain." Therefore, no impacts to the floodplain are anticipated as a result of the proposed Twin Cedars project.

3. *Preservation of natural and historical features.*

   The project area has been concentrated within the areas previously developed and/or utilized for agricultural purposes so that minimal tree clearing will occur on the project site. The presence of rare and endangered plants, animals, and natural communities will be investigated during the course of design to better assist the preservation process in accordance with regulatory requirements.

   As noted in the comments from the State Historic Preservation Office (SHPO) received during the PLUS review, "there are no known archaeological sites or known National register listed or eligible properties on the parcel." Therefore, no impacts to historical features are anticipated as a result of the proposed Twin Cedars project.

4. *Preservation of open space and scenic views.*

   The implementation of RPC design option in the creation of the proposed Twin Cedars layout is anticipated to result in more than 42 acres (66% of project area) to be utilized for passive and active open space purposes. Throughout much of the community, open space areas have been provided adjacent to almost all of the proposed residential lots, in addition to the perimeter buffers required by the Sussex County Zoning Code. The open space areas will be enhanced with new landscape plantings and perimeter landscape berms will be implemented where practical. A centralized community amenity area will be provided for the enjoyment and active recreation of the community residents.

   Much of land located to the southwest of the development area on-site is currently wooded. Almost the entirely of this area will remain in an undisturbed state and provide scenic natural views for much of the community.

5. *Minimization of tree, vegetation and soil removal and grade changes.*

   As noted above, much of the existing development site has been previously cleared and has been previously developed as apartments and/or utilized for agricultural purposes. Of the existing 38 +/- acres of wooded areas on site, 28 +/- acres are anticipated to remain undisturbed. It is anticipated that the new plantings proposed for the buffer areas and throughout the community open space areas will offset a portion of the trees loss due to clearing as a result of the proposed development.

   The design will follow the natural grade of the existing site to the greatest extent possible while maintaining proper drainage and stormwater flow within the project. Only those areas that are proposed for development are planned to be disturbed. Erosion and Sediment control BMPs will be employed in accordance with Sussex Conservation District (SCD) and Delaware Department of Natural Resources and Environmental Control (DNREC) guidelines in order to minimize erosion and loss of soil throughout the construction process.

6. *Screening of objectionable features from neighboring properties and roadways.*

   A 20'-wide landscaped buffer strip will be provided around the perimeter of the site adjacent to the neighboring residential parcels in accordance with Section 99-6 of the County Subdivision Code. Additionally, a 75' buffer area has been provided between the apartment area and the Zion Church Road frontage in accordance with the County Zoning Code. As noted above, these areas will be enhance with landscape berms where feasible. A site landscape plan will be incorporated into the design documents with consideration given to the utilization of native Delaware plants and trees where practicable.

   No on-site sewer or water facilities are anticipated to be require for this project. In the event these facilities are required (i.e. sanitary sewer pumping station), they will be screened with landscaping so that they are congruent with the surrounding areas.

7. *Provision for water supply.*

   Artesian Water Company, Inc. (a certified PUC utility company) will provide central water service for the project. Plans will be submitted concurrently to both Sussex County and the State Department of Health and Human Services in order to obtain an Approval to Construct and an Approval to Operate with regard to all of the proposed water facilities. Artesian Water Company, Inc. has issued a "Willing & Able" letter indicating ability to provide service to the subject project in accordance with State standards.

   As part of the water supply design, Fire Marshal requirements will be adhered to with regard to the water distribution system.

Based on preliminary discussions with Artesian Water, a large water main is located directly in front of the subject parcels along Zion Church Road that is anticipated to have available capacity to service the proposed Twin Cedars project. It is anticipated a direct connection will be made to this main.

8. *Provision for sewage disposal.*

   Sussex County will provide central sewer service for the project. Plans will be submitted concurrently to both Sussex County Engineering and DNREC for ultimate approval of the plans and construction, in addition to the operation of the proposed wastewater collection, transmission, treatment, and disposal facilities.

   The Twin Cedars site is currently located within a Sussex County Johnson Corner Sanitary Sewer District. A Sewer Service Concept Evaluation (SSCE) was issued by Sussex County Engineering Department on September 23, 2019. It is anticipated that on site gravity sewer system will connect directly to the existing County facilities located along Zion Church Road at County Manhole JC-110 or JC-111 in accordance with the recommendations of the SCCE. No on-site sanitary sewer pump stations are anticipated to be required at this time.

9. *Prevention of pollution of surface and groundwater.*

   Stormwater faculties will be designed according to DNREC and SCD standards and regulations; as such, they will be designed to reduce impacts to surrounding natural water resources. Designs are anticipated to include the use of natural looking and functioning features like bio-swales, bio-retention, infiltration facilities, created wetlands, and/or extended detention wet pond facilities to allow the stormwater to receive pollutant removal prior to infiltration and/or discharge from the developed site.

10. *Minimization of erosion and sedimentation, minimization of changes in groundwater levels, minimization of increased rates of runoff, minimization of potential for flooding and design of drainage so that the groundwater is maximized.*

    Erosion and sediment control plans will be developed in accordance with regulatory requirements. Careful planning and construction phasing will allow the contractor to minimize the area of disturbance at any given time in order to limit the potential for sediment issues on-site.

    On-site stormwater facilities will be designed to filter and infiltrate or slowly release stormwater runoff to mimic existing conditions in order to not exacerbate downstream flooding issues. Infiltration and/or slow release facilities will be employed in accordance with DNREC guidelines will help mimic recharge/discharge from the developed site for the Resource Protection Event

Volume (RPv). On site management for the Conveyance (Cv) and Flood (Fv) events will be provided in to meet State and SCD requirements.

11. *Provision for safe vehicular and pedestrian movement within the site and to adjacent roadways.*

    Construction plans for the proposed site entrance and any off-site road improvements will be designed in accordance with DelDOT regulatory requirements. Easement areas have been provided along the Zion Church Road frontage for the installation of a shared use path in accordance with DelDOT's typical requirements. Final plans will be submitted to DelDOT for review and approval prior to construction.

    Construction plans for the interior private roads will be developed in accordance with the requirements of the Sussex County Code and Sussex County Engineering. In addition to the sidewalks to be provided on both sides of all internal streets. Street lighting will also be provided along all private roads to promote safety within the development.

    Additionally, all private roads and community parking lot areas will be designed in accordance with Fire Marshal requirements to ensure adequate lane widths, emergency access, and any additional safety features for fire / rescue vehicular movement.

12. *Effect on area property values.*

    The Twin Cedars project proposes a community comprised of market-rate single-family detached and multifamily townhomes; additionally, a portion of the project will be comprised of market rate rental multifamily apartment units. This development configuration is consistent with the development options permitted within the underlying GR zoning and the Sussex County Codes.

    The single-family component of the project is anticipated to be consistent with the recently constructed nearby communities of Batson Creek Estates and Fox Haven. The townhome and apartment components will provide a similar design aesthetic at an alternate price point that will not negatively impact neighboring property values. Perimeter buffering areas will be utilized to reduce direct visual impact on neighboring parcels.

    The project is proposed to modify the configuration / alignment of the Batson Branch, Prong 1 Tax Ditch. These modifications will improved drainage for the upstream properties, and provide SWM in a currently unregulated area. As a result, these improvements should have a positive impact on both the upstream, and downstream properties.

13. *Preservation and conservation of farmland.*

The subject parcel is located entirely within the Coastal Area designated growth zone as shown in the Sussex County Zoning Map and Comprehensive Development Plan. Utilization of a Residential Planned Community configuration at the Twin Cedars site will allow for the efficient utilization of land within the targeted growth areas, and reduce the development of agricultural areas outside of the growth areas.

14. *Effect on schools, public buildings and community facilities.*

The Twin Cedars site is located within the Indian River School District (IRSD). Based on similar projects within the area, an estimate of one student per 6 dwelling units may be anticipated as a result of this project. The proposed 254 units would therefore result in an increase of approximately 43 students being introduced to the IRSD. It is anticipated that the children of Twin Cedars would attend Showell Elementary School, Selbyville Middle School, and Indian River High School based on current distribution patterns within the district. Coordination with the school district will occur throughout the plan approval process to determine necessary school bus stop location(s) to serve the residents of Twin Cedars.

It is anticipated that additional local property taxes and the state contribution from income tax receipts will continue to support the school system to offset the impacts created by the additional student demand associated with this project.

15. *Effect on area roadways and public transportation.*

Based on the proposed combination of single-family and multi-family homes, an estimated 2,030 average daily trips will be added to the existing road network surrounding the Twin Cedars site. To evaluate the impacts of these additional vehicle trips, a Traffic Impact Study (TIS) was prepared by The Traffic Group and approved by DelDOT in July 2020. Based upon recommendations of the TIS review, it is anticipated that the developer will construct one site entrance to the project from Zion Church Road in accordance with current DelDOT standards. Additionally, it is anticipated that the developer will participate in a signal agreement for the future construction of a traffic signal at the intersection of Zion Church Road (Route 20) and Bayard Road / Johnson Road, through an equitable share contribution.

Through the DelDOT review and approval process related to the Site Entrance Plans and the Record Plats, the needs for contributions to existing projects and/or construction of off-site road improvements to the existing infrastructure (roadways, intersections, etc.) and public transportation (i.e. bus stops) will be finalized.

16. *Compatibility with other area land uses.*

The Twin Cedars residential project has been designed as a Residential Planned Community under the provisions allocated by the Sussex County Zoning Code. The proposed single-family lots should blend in well with the surrounding land uses surrounding the project site as the area is generally dominated by residential uses. The surrounding properties comprised of a mixture of GR, C-1, C-2, CR-1, AR-1, AR-2, and MR Zoning classifications. The cluster configuration and proposed lot sizes within the single-family portion of the site are similar in nature to the recently constructed Batson Creek Estates and Fax Haven communities. The overall project density proposed under the RPC will result in similar overall project density.

17. *Effect on area waterways.*

Erosion and sediment control measures will be implemented during construction in accordance with DNREC requirements to minimize impact to surrounding waterways during the construction process. It is anticipated that permanent stormwater management facilities utilizing created wetland and extended detention will be implemented where infiltration based practices are determined to not be practicable. These facilities will be provide slow release of the runoff to mimic pre-development hydrology in accordance with the State and Local requirements. Runoff from agricultural uses is often heavily loaded with sediment, nitrogen, and phosphorus. By developing the subject parcel, there is a potential improvement in water quality by converting the existing agricultural land with no stormwater practices into a residential community with stormwater facilities designed in accordance with current DNREC regulatory requirements.

Appendix 2 – Environmental Assessment and Public Utility Evaluation

115-194.3 Compliance

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Environmental Assessment & Public Facilities Evaluation

Sussex County Code Chapter 115-194.3 Compliance

for

Twin Cedars

Baltimore Hundred
Sussex County, Delaware

Prepared By:
Morris & Ritchie Associates, Inc.
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New Castle, DE 19720
Phone: (302) 326-2200
Attn: Christopher J. Flathers, P.E.

April 2021

ENVIRONMENTAL ASSESSMENT & PUBLIC FACILITIES EVALUATION

It is the intent of this submittal to demonstrate how the proposed Twin Cedars project meets, or exceeds, the regulatory requirements and follows the County growth objectives with regard to the Sussex County Code and Ordinances.

Located within the C-1, CR-1, and GR Zoning Districts, the proposed Residential Planned Community of Twin Cedars will include mixture of single family detached and multifamily apartments and townhomes. Based upon an overall site area of 64+/- acres, the resulting gross density of the proposed project will be 4.31 dwelling units per acre. The project proposes to rezone the C-1 and CR-1 portions of the site to GR to eliminate the existing split zoning of the subject parcel. The Residential Planned Community ordinance will be applied to the overall GR zoned site area in an effort to efficiently utilize the available land areas, and promote a greater amount of preserved and usable open space areas within the project site.

All infrastructure for the development (both on-site and off-site), will be designed and constructed at the developer's expense. The infrastructure will include roads, sidewalks, lighting within the project, off-site road improvements along road frontage, stormwater management, on-site sewer collection and transmission, on-site water distribution, and on-site community recreation facilities.

Water and sewer will both be centralized public systems. Water service for the community will be provided by Artesian Water Company, Inc. (AWC). All water distribution will be designed to requirements of the State Fire Marshal's Office and DNREC and constructed in accordance with AWC standards. Sanitary sewer service for the community will be provided by Sussex County. All sanitary sewer systems will be designed in accordance with State and County requirements and constructed in accordance with Sussex County standards.

The Twin Cedars community is proposed to be developed as combination of market rate single-family and townhome dwelling units. The multifamily apartments will be market rate rental units owned and operated under one ownership entity.

The information below is provided to address the requirements of Chapter 115-194.3.B(2) of the Sussex County Code:

a) *Proposed drainage design and the effect on stormwater quality and quantity leaving the site, including methods for reducing the amount of phosphorous and nitrogen in the stormwater runoff and the control of any other pollutants such as petroleum hydrocarbons or metals.*

   The grading of the developed site will attempt to maintain the drainage patterns of the pre-developed condition. Runoff from the developed site will be conveyed to on-site stormwater management (SWM) facilities through a combination of surficial sheet flow, open channel, and closed pipes.

The permanent on-site SWM faculties will be designed in accordance with Delaware Department of Natural Resources and Environmental Control (DNREC) and Sussex Conservation District (SCD) standards to minimize potential impacts to the receiving watershed. Designs are anticipated to include the use of infiltration based SWM practices including bio-swales, bio-retention, infiltration basins where practicable, in addition to created wetlands and/or extended detention wet pond facilities. These facilities will achieve pollutant loading to the receiving watershed through a combination of sedimentation, nutrient uptake, and runoff reduction. All SWM facilities will be designed in accordance with DNREC standards to achieve pollutant reduction requirements.

Erosion and sediment control measures will be implemented during the construction phase in accordance with DNREC requirements to minimize impact of sediment laden runoff discharging to the watershed. Runoff from agricultural uses is often heavily loaded with sediment, nitrogen, and phosphorus. By developing the subject parcel, there is a potential improvement in water quality by converting the existing agricultural land with no stormwater practices into a residential community with stormwater facilities designed in accordance with current DNREC regulatory requirements.

b) *Proposed method of providing potable and, where appropriate, irrigation water and the effect on public or private water systems and groundwater, including an estimate of average and peak demands.*

The Twin Cedars project is located within the CPCN service area assigned to Artesian Water Company, Inc. (AWC). The project will utilize public water supply to provide potable water and fire protection throughout the community. It is anticipated that the on-site distribution system will connect to the existing AWC water main located along the property frontage on Zion Church Road. No large scale irrigation is anticipated as a result of this project. AWC has issued a “Willing & Able” letter indicating ability to serve the proposed project in accordance with State standards.

Plans will be developed in accordance with AWC and Sussex County standards. These plans will be submitted concurrently to both Sussex County and the State Department of Health and Human Services in order to obtain an Approval to Construct and an Approval to Operate with regard to all of the proposed water facilities.

The 42 single-family, 44 townhomes, 168 apartments, and community center proposed by this project are anticipated to result in an average daily water demand of 64,000gallons, with a corresponding peak demand of 96,000 gallons per day. With no on-site wells proposed by this project, there is no anticipated direct impact to the groundwater at the site location due to the proposed water use.

c) *Proposed means of wastewater treatment and disposal with an analysis of the effect on the quality of groundwater and surface waters, including alternative locations for on-site septic systems.*

The Twin Cedars project is currently located within Sussex County's Johnson Corner Sanitary Sewer District (SSD). A Sewer Service Concept Evaluation (SSCE) was prepared by the Sussex County Utility Planning Division in September 2019; it is anticipated that the proposed on-site gravity sewer system will connect directly to the existing County gravity sewer system located along the property frontage on Zion Church Road in accordance with the SCCE recommendations. No sanitary sewer pump station is anticipated to be required to serve the Twin Cedars project. No on-site septic systems are proposed by the project; there are no anticipated impacts to the quality of groundwater or surface waters at the Twin Cedars site as a result of the proposed sanitary sewer systems to serve this community.

Plans will be developed in accordance with Sussex County standards and submitted concurrently to both Sussex County Engineering and the Delaware Department of Natural Resources for ultimate approval of the plans and construction.

d) *Analysis of the increase in traffic and the effect on the surrounding roadway system.*

As part of the application process for this project, a Service Level Evaluation was performed by DelDOT in November 2019. In accordance with the recommendations of this evaluation, a Traffic Impact Study (TIS) was prepared by The Traffic Group and submitted to DelDOT for review. DelDOT issued a letter of approval for the TIS on July 13, 2020.

Based on the proposed combination of single-family and multi-family homes, an estimated 2,030 average daily trips will be added to the existing road network surrounding the Twin Cedars site. In order to address the impacts of these additional trips on the surrounding road network, it is anticipated that the developer will make the following improvements in accordance with the TIS approval:

- Construct a full-movement access for the site onto Zion Church Road (Route 20)
- Complete roadway improvements to Zion Church Road to bring the roadway up to current DelDOT standards for the length of the project frontage.
- Contribute equitable share for installation of traffic signal at Route 20 and Bayard Road / Johnson Road.
- Construct bike lanes as part of Route 20 / site entrance improvements.
- Provide shared use path along site frontage.

e) *The presence of any endangered or threatened species listed on federal or state registers and proposed habitat protection areas.*

No endangered or threatened species are known to exist on site. No protected critical habitat areas are known to exist on the site for federally threatened or

endangered species based upon review of the US Fish & Wildlife Services Critical Habitat mapping tool.

(https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77)

During the PLUS review process, DNREC did not identify the site as containing any potential habitats for State protected species. The development area has been primarily limited to the previously cleared portions of the site; as shown by the Preliminary Plan, tree clearing will be limited, preserving approximately 70% of the existing wooded areas on-site.

f) *The preservation and protection from loss of any tidal or non-tidal wetlands on the site.*

A Wetlands Report was prepared by Geo-Technology Associates, Inc. (GTA) for the project site in March 2021. Based upon this investigation, it was determined that no jurisdictional wetlands or "Waters of the U.S" were identified within the limits of the subject project area in the professional opinion of GTA. Additionally, no tidal-wetlands are located within the project area. Requests for Jurisdictional Determination have been submitted to DNREC and ACOE for confirmation of these findings. Based upon the GTA delineation, no impact to regulated wetlands are anticipated as a result of this project.

Disturbances to portions of the Batson Branch, Prong 1 Tax Ditch that crosses the front portion of the site are anticipated as the alignment of this feature is modified by the proposed site development. These impacts will be performed under DNREC requirements and coordinated through the Tax Ditch managers.

g) *Provisions for open space as defined in § 115-4.*

The implementation of the RPC design option in the creation of the proposed Twin Cedars layout is anticipated to result in more than 42 acres (66% of total site area) to be utilized for passive and active open space purposes. Throughout much of the community, open space areas have been provided adjacent to all of the proposed residential lots. In addition, buffer areas will be provided around the perimeter of the parcel boundary in accordance with requirements of the Sussex County Zoning Code. The open space areas will be enhanced with new landscape plantings and perimeter landscape berms will be implemented where practical. A centralized community amenity area will be provided for the enjoyment and active recreation all of the community residents.

h) *A description of provisions for public and private infrastructure.*

Public infrastructure will be utilized to provide sanitary sewer and water service for the proposed community, as noted above. The site entrance at Zion Church Road and associated improvements along the project frontage will be constructed in accordance with current DelDOT standards; the associated right-of-way frontage will be dedicated to public use for future maintenance by DelDOT. The internal community streets and associated storm drainage will be private infrastructure

designed in accordance with current Sussex County standards, and will be owned and maintained by the Twin Cedars Homeowners Association (TCHOA).

Public water will be provided by AWC; all water mains will be designed and constructed in accordance with AWC and Sussex County standards as applicable. AWC will operate and maintain the water facilities throughout the community.

Public sanitary sewer will be provided by Sussex County; all sewers will be designed and constructed in accordance with Sussex County standards. Sussex County will operate and maintain the sewer facilities throughout the community.

The on-site stormwater management facilities will be designed and constructed in accordance with DRNEC and SCD standards as applicable. The TCHOA will be responsible for the long term maintenance and operation of all on-site SWM facilities.

i) Economic, recreational or other benefits.

The architecture, housing styles, and proposed construction practices that are anticipated to be used for the single-family component of the proposed Twin Cedars community will likely mirror those practices employed at the nearby communities like Batson Creek Estates and Fox Haven. It is anticipated that similar architectural style would be extended to the multifamily townhome units as well. Perimeter buffer areas will be employed to minimize impact to surrounding parcels.

The Twin Cedars community will incorporate a central amenity feature that will provide an active recreation component for use by the community residents.

The subject parcel is located entirely within the Coastal Area growth zone (formerly ESDDOZ) as shown in the Sussex County Zoning Map and Comprehensive Development Plan. Utilization of a cluster type development developed as an RPC under the County Zoning Code will allow for the efficient utilization of land within the targeted growth areas, and reduce the development of agricultural areas outside of the growth area.

As noted in the PLUS comments provided by the State Housing Authority, the unit mixture proposed by the Twin Cedars project will “facilitate a more affordable housing product in the southern Coastal Area.”

j) The presence of any historic or cultural resources that are listed on the National Register of Historic Places.

The Twin Cedars site contains no known historic or cultural resources that are listed on the National Register of Historic Places. In addition, no evidence of burial sites have been observed within the project area.

k) An affirmation that the proposed application and proposed mitigation measures are in conformance with the current Sussex County Comprehensive Plan.

The entirety of the Twin Cedars site is located within the Coastal Area (formerly known as the Environmentally Sensitive Development District Overlay Zone) as

shown on the current Sussex County Comprehensive Plan. The site has ready access to public utilities as noted above. Utilizing the RPC design approach afforded by the County Code will allow for efficient use of the project site.

l) Actions to be taken by the applicant to mitigate the detrimental impacts identified relevant to Subsection B(2)(a) through (k) above and the manner by which they are consistent with the Comprehensive Plan.

The Twin Cedars project, from site selection to site layout, has resulted in a proposed project that will have minimal detrimental impact on the natural resources of the County, and the area surrounding the project site. The Twin Cedars site design aligns with the goals of the Sussex County Comprehensive Plan:

The Twin Cedars site is located within the Coastal Area growth zone; this is consistent with the County's strategy to "prioritize new development in designated Growth Areas to better preserve other areas".

The Twin Cedars project is located within Johnson Corner Sanitary Sewer District (SSD) and within the Artesian Water Company, Inc. CPCN area. With direct access to existing public sewer and water mains located along the Zion Church Road frontage, the site is anticipated to have adequate access to public utilities. This is consistent with the County's objective for "planning that considers the efficient location of public services and infrastructure."

The project has been reviewed by DelDOT for impacts to the surrounding Road network. Based on the proposed combination of single-family and multi-family homes, an estimated 2,030 average daily trips will be added to the existing road network surrounding the Twin Cedars site. To evaluate the impacts of these additional vehicle trips, a Traffic Impact Study (TIS) was prepared by The Traffic Group and approved by DelDOT in July 2020. Based upon recommendations of the TIS review, it is anticipated that the developer will construct one site entrance to the project from Zion Church Road in accordance with current DelDOT standards. Additionally, it is anticipated that the developer will participate in a signal agreement for the future construction of a traffic signal at the intersection of Zion Church Road (Route 20) and Bayard Road / Johnson Road, through an equitable share contribution. Through these proposed improvements, and commitments to financial contributions to the offsite intersection upgrades, the developer has demonstrated efforts to mitigate the traffic impacts as a result of the propose Twin Cedars project. This approach is consistent with the County's strategy for the coordination with "DelDOT on road improvements and other transportation projects."

The Twin Cedars site does not contain any regulated wetland areas, as noted above. On-site stormwater management facilities will be provided to mitigate the runoff from the developed site on the adjacent properties and downstream areas. The entirety of the site is located outside of a delineated FEMA floodplain; therefore, no direct impact to the floodplain is anticipated as a result of the proposed development on site.

A portion of the project site area was previously occupied by a small apartment complex known as Twin Cedars. Re-use of the site for residential use will be a continuation of this prior residential use. The project area is bordered to the northwest by the previously approved Hampden Park subdivision; with several other residential subdivisions, including Deer Run Acres and Fox Haven, in close proximity. The Twin Cedars residential project has been designed as a Residential Planned Community under the provisions allocated by the Sussex County Zoning Code. The proposed single-family lots should blend in well with the surrounding land uses surrounding the project site as the area is generally dominated by residential uses. The surrounding properties are comprised of a mixture of GR, C-1, C-2, CR-1, AR-1, AR-2, and MR Zoning classifications. The cluster configuration and proposed lot sizes within the single family portion of the site are similar in nature to the recently constructed Batson Creek Estates and Fax Haven communities.

The Twin Cedars project is proposing the implementation of a 20'-wide forested / vegetated buffer surrounding the outer boundary of the project area bordering the neighboring residential properties in accordance with the County Code requirements. Where feasible, these buffer areas will be enhanced with berms in order to "minimize the adverse impacts of development on existing development."

The implementation of RPC development option under the County Code ordinance will allow for the efficient use of the Twin Cedars site, while also providing for increased open space areas within the community. The project area is currently zoned for residential use and has been identified by the County for development under the Coastal Area designation. The efficient utilization of this site will allow for the concentration of development within one of the growth areas, and allow for the preservation of the rural areas of the County to support the "importance of the agricultural land base of the County".

Although the Twin Cedars site does not front directly upon the inlays, the project is located within the Dirickson-Little / Inland Bays watershed. Throughout the construction phase of the project, temporary erosion control measures will be utilized to minimize the discharge of sediment laden water off-site. In the final configuration of the site structural and no-structural SWM BMPs will be utilized to reduce the direct discharge of polluted runoff to the watershed. The Twin Cedars project will utilize the connection to the County public sewer system, eliminating the potential need for on-site septic systems. These practices will support the County's goal to "recognize the importance of the Inland Bays."

Appendix 3 – Project Site Exhibits

Tax Parcel

Zoning

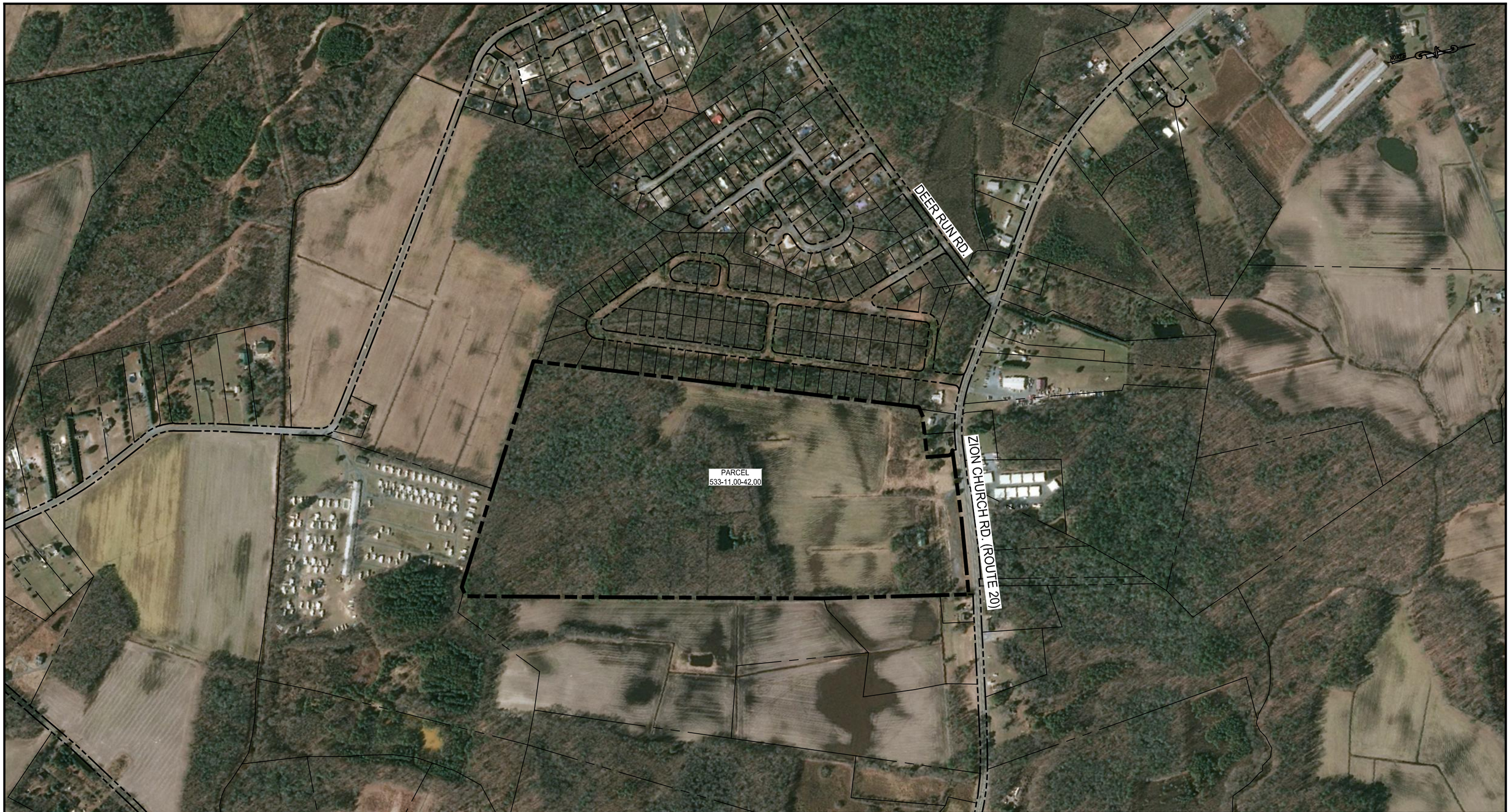
Future Land Use

FEMA Floodplain

State Spending Strategies

Source Water Protection Areas

USDA Soil Mapping



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MRAGTA.COM

PARCEL EXHIBIT
FOR
TWIN CEDARS

SUSSEX COUNTY, DE

SCALE:	DATE:	DRAWN BY:	DESIGN BY:	REVIEW BY:	JOB NO. :
1"=500'	5/21/20	CJF	CJF	PLT	20426

ZONING LEGEND

- AG. PRESERVATION
- B-1
- CR-1
- C-1
- GR
- MR
- GR-RPC (PROPOSED)

NORTH

BEAR HOLE RD.

DEER RUN RD.

ZION CHURCH RD. (ROUTE 20)

JOHNSON RD.

PARCEL
533-11.00-42.00

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EXISTING ZONING EXHIBIT
FOR
TWIN CEDARS
SUSSEX COUNTY, DE

SCALE: 1"=500'	DATE: 4/15/21	DRAWN BY: CJF	DESIGN BY: CJF	REVIEW BY: PLT	JOB NO. : 20426

FUTURE LAND USE LEGEND

Growth Areas
- Municipalities
- Town Center
- Developing Area
- Existing Development Area
- Coastal Area
- Commercial
- Industrial Area

Rural Areas
- Low Density
- Protected Land
- Ag. Preservation District
- Ag. Preservation Easement

rd

20

17

Ocean View

South Bethany

113

Selbyville

SITE

54

Fenwick Island

NORTH

WORCESTER COUNTY

MRA

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FUTURE LAND USE EXHIBIT
FOR
TWIN CEDARS
SUSSEX COUNTY, DE

SCALE: 1"=5,000'	DATE: 5/21/20	DRAWN BY: CJF	DESIGN BY: CJF	REVIEW BY: PLT	JOB NO. : 20426

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

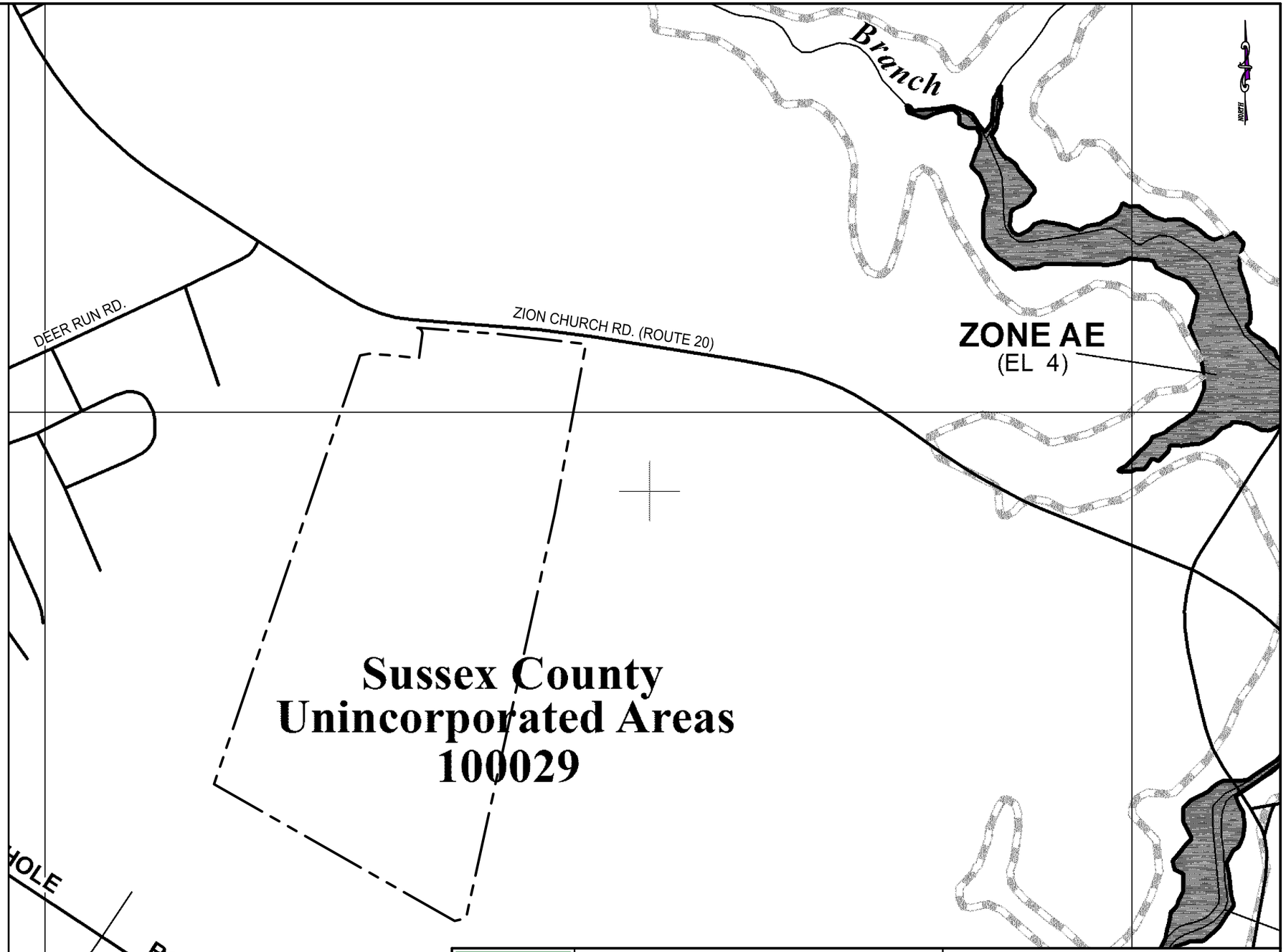
ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
	Limit of Moderate Wave Action
	Advisory line estimating flooding extents if dunes are breached during a 0.2% annual chance flood event
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*



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FEMA FLOODPLAIN EXHIBIT
FOR
TWIN CEDARS
SUSSEX COUNTY, DE

SCALE: 1"=500'	DATE: 5/21/20	DRAWN BY: CJF	DESIGN BY: CJF	REVIEW BY: PLT	JOB NO. : 20426

2020 STRATEGIES FOR STATE POLICIES & SPENDING

- LEVEL 1 - HIGHEST PRIORITY
- LEVEL 2
- LEVEL 3
- LEVEL 4 - LOWEST PRIORITY
- OUT OF PLAY

NORTH

DEER RUN RD.

ZION CHURCH RD. (ROUTE 20)

PARCEL
533-11.00-42.00

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STATE STRATEGIES EXHIBIT
FOR
TWIN CEDARS

SUSSEX COUNTY, DE

SCALE:	DATE:	DRAWN BY:	DESIGN BY:	REVIEW BY:	JOB NO. :
1"=500'	04/15/21	CJF	CJF	PLT	20426

DNREC SOURCE WATER PROTECTION AREAS

- WELLHEAD PROTECTION AREA
- EXCELLENT RECHARGE AREA

NORTH

DEER RUN RD.

ZION CHURCH RD. (ROUTE 20)

PARCEL
533-11.00-42.00

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SOURCE WATER PROTECTION AREA EXHIBIT
FOR
TWIN CEDARS
SUSSEX COUNTY, DE

SCALE:	DATE:	DRAWN BY:	DESIGN BY:	REVIEW BY:	JOB NO. :
1"=500'	5/21/20	CJF	CJF	PLT	20426

SOIL LEGEND

MAP UNIT	DESCRIPTION	HSG
AsA	ASKECKSY LOAMY SAND, 0 TO 2 PERCENT SLOPES	A/D
BhA	BERRYLAND MUCKY LOAMYSAND, 0 TO 2 PERCENT SLOPES	A/D
HmA	HAMMONTON LOAMY SAND, 0 TO 2 PERCENT SLOPES	B
HuA	HURLOCK LOAMY SAND, 0 TO 2 PERCENT SLOPES	A/D
KsA	KLEJ LOAMY SAND, 0 TO 2 PERCENT SLOPES	A/D
LO	LONGMARSH AND INDIANTOWN SOILS, FREQUENTLY FLOODED	B/D
MmA	MULLICA MUCKY SANDY LOAM, 0 TO 2 PERCENT SLOPES	A/D

NORTH

DEER RUN RD.

ZION CHURCH RD. (ROUTE 20)

PARCEL
533-11.00-42.00

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SOILS EXHIBIT
FOR
TWIN CEDARS

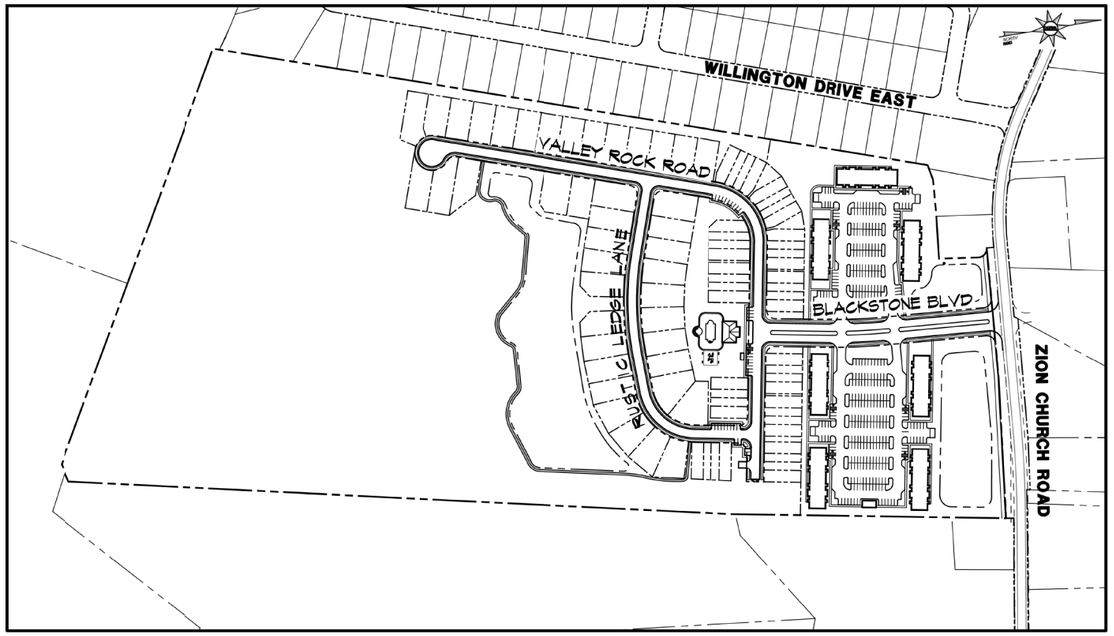
SUSSEX COUNTY, DE

SCALE: 1"=500'	DATE: 5/21/20	DRAWN BY: CJF	DESIGN BY: CJF	REVIEW BY: PLT	JOB NO. : 20426

Appendix 4 – Preliminary Plan

TWIN CEDARS

SUSSEX COUNTY, DELAWARE
PRELIMINARY PLANS
SUSSEX COUNTY PLANNING # XXXX
GR - RPC

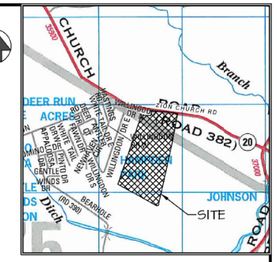


SITE OVERVIEW
SCALE: 1" = 200'

200 100 0 100 200 400
SCALE: 1" = 200'

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED R/W LINE
- PROPOSED LOT LINE
- PROPOSED BUILDING SETBACK LINE
- 44 EXISTING CONTOURS
- 44 PROPOSED CONTOURS
- (7) PROPOSED LOT NUMBER
- EXISTING WOODLANDS LINE
- WOODLAND PRESERVATION LINE



LOCATION MAP
SCALE: 1" = 2000'

PROJECT TEAM

DEVELOPER:	BAY DEVELOPERS, LLC 220 WESTON DRIVE DOVER, DE 19904 ATTN: MR. HENRY MAST
LAND PLANNERS, CIVIL ENGINEERS:	MORRIS & RITCHIE ASSOCIATES, INC. 18 BOULDEN CIRCLE, SUITE 36 NEW CASTLE, DE 19720 ATTN: MR. PHILLIP L. TOLLIVER, P.E.
SURVEYOR:	MORRIS & RITCHIE ASSOCIATES, INC. 8 WEST MARKET STREET GEORGETOWN, DE 19947 ATTN: MR. GARY POWERS
ENVIRONMENTAL CONSULTANT:	GEO-TECHNOLOGY ASSOCIATES, INC. 3445 BOX HILL CORPORATE CENTER DRIVE, SUITE A ABINGDON, MD 21009 ATTN: MR. ANDY STANSFIELD
GEOTECHNICAL ENGINEER:	GEO-TECHNOLOGY ASSOCIATES, INC. 21183 STERLING AVENUE, SUITE 7 GEORGETOWN, DE 19947 ATTN: MR. GREG SAUTER
TRAFFIC CONSULTANT:	THE TRAFFIC GROUP 9900 FRANKLIN SQUARE DR. - SUITE H BALTIMORE, MD 21236 ATTN: MR. JOE CALOGGERO, P.E.
ATTORNEY:	MORRIS JAMES WILSON HALBROOK & BAYARD LLP 107 N. MARKET STREET P.O. BOX 690 GEORGETOWN, DE 19947 ATTN: MR. DAVID C. HUTT

INDEX OF DRAWINGS

DEVELOPER'S CERTIFICATION

I, UNDERSIGNED, AS DEVELOPER OF THE PROPERTY SHOWN, HEREBY APPROVE THESE PLANS FOR DEVELOPMENT AS SHOWN OR OTHERWISE NOTED.

BAY DEVELOPERS, LLC — DATE
220 WESTON DRIVE
DOVER, DE 19904

OWNER'S CERTIFICATION

I, UNDERSIGNED, AS OWNER OF THE PROPERTY SHOWN, HEREBY APPROVE THESE PLANS FOR DEVELOPMENT AS SHOWN OR OTHERWISE NOTED.

BAY DEVELOPERS, LLC — DATE
220 WESTON DRIVE
DOVER, DE 19904

WETLANDS STATEMENT

GEO-TECHNOLOGY ASSOCIATES, INC. (GTA) HAS CONDUCTED A FIELD REVIEW WITHIN THE BOUNDARIES OF THIS PLAT TO EVALUATE THE PRESENCE OR ABSENCE OF POTENTIAL STATE AND FEDERAL JURISDICTIONAL WETLANDS FOR THE PURPOSES OF DELAWARE WETLAND AND SUBAQUEOUS LAND REGULATIONS AND SECTION 404 OF THE CLEAN WATER ACT. GTA'S REVIEW WAS CONDUCTED IN GENERAL ACCORDANCE WITH THE TECHNIQUES AND CRITERIA PROVIDED IN THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL: ATLANTIC AND GULF COSTAL PLAIN REGION (VERSION 2.0), DATED NOVEMBER 2010. THE LIMITS OF THE WETLANDS WERE EVALUATED IN THE FIELD BY GTA PERSONNEL USING BEST PROFESSIONAL JUDGEMENT. NO WETLANDS OR WATERWAYS WERE OBSERVED WITHIN THE BOUNDARIES OF THIS PLAT. NO STATE OR FEDERAL JURISDICTIONAL APPROVAL WAS OBTAINED FOR THIS PROPERTY.

ANDY STANSFIELD — DATE
GEO-TECHNOLOGY ASSOCIATES, INC.

ENGINEER'S CERTIFICATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE AND THAT THE PLAN SHOWN AND DESCRIBED HEREON, IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY ACCEPTED STANDARDS AND PRACTICES AND BY THE SUSSEX COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS TO THE EXTENT THAT IT DESCRIBES THE PROPOSED MANNER AND LAYOUT OF THE SUBDIVISION.

PHILLIP L. TOLLIVER, P.E. — DATE
DE LICENSE NO. #12484

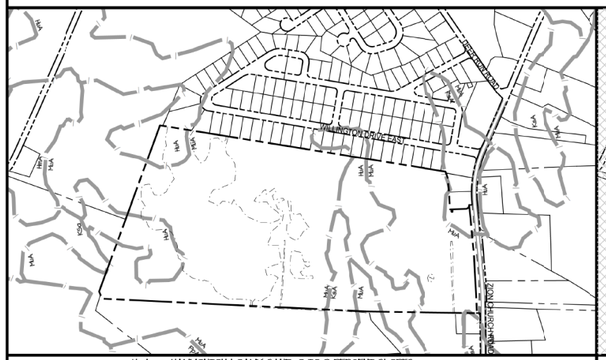
PLAN APPROVALS

SUSSEX COUNTY ENGINEERING DEPARTMENT
2 THE CIRCLE
GEORGETOWN, DE 19947

APPROVED — DATE

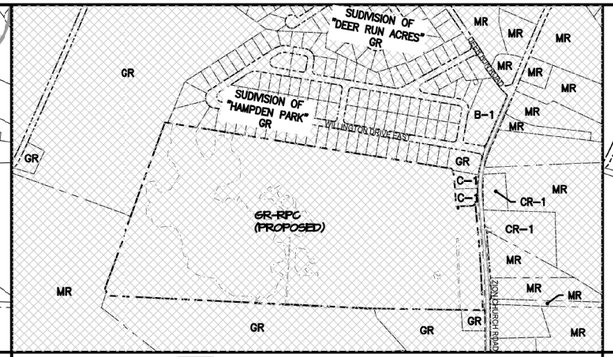
APPROVED BY: _____ DATE
CHAIRMAN OR SECRETARY
SUSSEX COUNTY PLANNING AND ZONING COMMISSION

APPROVED BY: _____ DATE
PRESIDENT
SUSSEX COUNTY PLANNING



SOILS MAP
SCALE: 1" = 500'

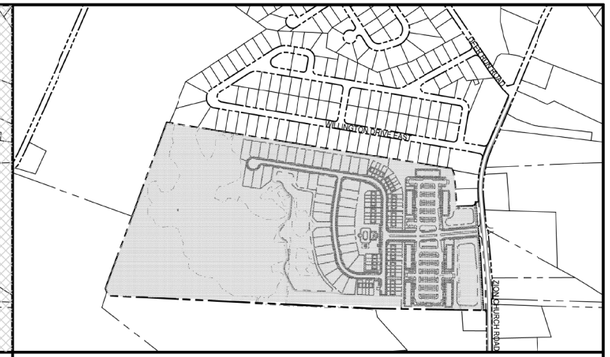
- HmA - HAMMONTON LOAMY SAND, 0 TO 2 PERCENT SLOPES
- HuA - HURLOCK LOAMY SAND, 0 TO 2 PERCENT SLOPES
- KeA - KLEJ LOAMY SAND, 0 TO 2 PERCENT SLOPES
- MuA - MULLICA-BERRYLAND COMPLEX, 0 TO 2 PERCENT SLOPES
- PpA - PEPPERBOX LOAMY SAND, 0 TO 2 PERCENT SLOPES



ZONING MAP
SCALE: 1" = 500'

COASTAL AREA (FORMERLY ESDDOZ)

CR-1 - COMMERCIAL RESIDENTIAL
C-1 - GENERAL COMMERCIAL
GR - GENERAL RESIDENTIAL
MR - MEDIUM RESIDENTIAL
B-1 - NEIGHBORHOOD BUSINESS



PHASING MAP
SCALE: 1" = 500'

THE PROJECT WILL BE APPROVED AS A SINGLE PHASE PROJECT WITH THREE (3) OPERATIONAL BREAKS FOR PURPOSES OF BONDING, BENEFICIAL OCCUPANCY, INSPECTION, RELEASE OF USE AND OCCUPANCY PERMITS.

MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
18 BOULDEN CIRCLE, SUITE 36
NEW CASTLE, DELAWARE 19720
(302) 326-2200
FAX: (302) 326-2399
WWW.MRAGTA.COM

CHRISTOPHER J. FLANNERY — LICENSE No. 14787 — DELAWARE PROFESSIONAL ENGINEER — 04/28/21
ENGINEER'S SEAL

TITLE SHEET
PRELIMINARY PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS	
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC	JOB NO.: 20426
04/27/21	UPDATED WETLANDS INFORMATION	SCALE: AS NOTED
		DATE: 10/21/2019
		DRAWN BY: RDG
		DESIGN BY: CJF
		REVIEW BY: PLT
		SHEET: 1 OF 8

CONSTRUCTION NOTES

1. CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT (1-800-282-8555) AT LEAST (3) WORKING DAYS PRIOR TO EXCAVATION, TO HAVE EXISTING UNDERGROUND UTILITIES LOCATED AND MARKED.
2. ALL MATERIALS & WORKMANSHIP SHALL MEET THE STATE OF DELAWARE STANDARDS & SPECIFICATIONS.
3. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND PROJECT SPECIFICATIONS.
4. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING TWO WEEKS PRIOR TO THE START OF CONSTRUCTION AND SHALL APPRISE AND COORDINATE DURING ALL PHASES OF CONSTRUCTION:

A.	BAY DEVELOPERS, LLC	302-736-0424
B.	SUSSEX COUNTY ENGINEERING DEPARTMENT	302-855-7718
C.	ARTESIAN WATER COMPANY	302-453-6711
D.	SUSSEX CONSERVATION DISTRICT	302-856-2105
E.	DELMARVA POWER	609-758-4700
F.	VERIZON	302-422-1464
G.	DELAWARE ELECTRIC COOP CO.	302-344-5941
H.	DNREC	302-856-5488

5. CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL RIGHT-OF-WAY LINES AND PROPERTY LINES TO HIS OWN SATISFACTION. ALL PROPOSED UTILITIES ARE TO BE CONSTRUCTED WITHIN THE ROADWAY OR EASEMENT RIGHT-OF-WAY. DISTURBED AREAS BEYOND THE EASEMENT LINES SHALL BE RESTORED IMMEDIATELY TO THEIR ORIGINAL CONDITION.
6. INFORMATION SHOWN HEREON IS BASED UPON GIS DATA OBTAINED THROUGH THE STATE OF DELAWARE GIS WEBSITE (FIRSTMAP.DELAWARE.GOV\DATA\ARCGIS.COM) AND DOES NOT REPRESENT FIELD RUN TOPOGRAPHIC OR BOUNDARY SURVEY. SITE LAYOUT IS SUBJECT TO REVISION PENDING FIELD SURVEY.
7. EXISTING UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE BASED UPON THE BEST AVAILABLE INFORMATION AND ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. NO GUARANTEE IS MADE OR IMPLIED REGARDING THE ACCURACY OR COMPLETENESS THEREOF. CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF DEPTH, SIZE AND MATERIAL OF ALL UNDERGROUND UTILITIES TO HIS OWN SATISFACTION BEFORE BEGINNING ANY EXCAVATION OR UTILITY INSTALLATION. THE OWNER AND ENGINEER DISCLAIM ANY RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. IN THE CONTRACTOR RELIES ON SAID INFORMATION, HE DOES SO AT HIS OWN RISK. THE GIVING OF THE INFORMATION ON THE PLANS WILL NOT RELIEVE THE CONTRACTOR OF HIS OBLIGATIONS TO SUPPORT AND PROTECT ALL SHOWN OR NOT SHOWN EXISTING UTILITIES AND APPURTENANCES. SHOULD ANY EXISTING UTILITIES BE DAMAGED BY THE CONTRACTOR, THE CONTRACTOR SHALL REPAIR THE DAMAGE CAUSED TO THE UTILITY OWNER'S SATISFACTION, AT THE CONTRACTOR'S EXPENSE.
8. DRAWINGS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE PERFORMED IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, AS AMENDED AND ALL RULES AND REGULATIONS THERETO APPURTENANT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF TRAFFIC IN ALL WORK AREAS.
10. ROUGH GRADING SHALL BE COMPLETE PRIOR TO THE CONSTRUCTION OF WATER & SEWER SYSTEMS.
11. USE ONLY SUITABLE AND APPROVED GRANULAR MATERIAL IN ACCORDANCE WITH SECTION 209 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS AND REFERENCED BY SUSSEX COUNTY ORDINANCE 38 SECTION 5-25 EXCAVATION AND BACKFILL FOR PIPE TRENCHES SUBSECTION B MATERIALS
12. CONTRACTOR SHALL ADJUST TO FINISH GRADE AS NECESSARY ANY VALVE BOXES, MANHOLES, CATCH BASINS ETC., PRIOR TO PLACING PAVING.
13. CONTRACTOR SHALL PROVIDE STAKEOUT NECESSARY FOR THE INSTALLATION OF UTILITIES, STORMDRAINS, PAVING AND ALL OTHER SITE WORK INCLUDED IN THESE PLANS. ALL STAKEOUT WORK IS TO BE PERFORMED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF DELAWARE.
14. CONTRACTOR TO MAINTAIN MINIMUM OF 3.0 FEET OF COVER OVER ALL NEW WATER LINES AS MEASURED FROM TOP OF PIPE TO FINISHED GRADE, UNLESS OTHERWISE NOTED.
15. SEWER LINES SHALL HAVE MINIMUM VERTICAL CLEARANCE OF 18 INCHES FROM WATER MAINS AT CROSSINGS. MAINTAIN A 10 FOOT MINIMUM PLAN SEPARATION BETWEEN SEWER AND WATER MAINS. SEWER LINES SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 12 INCHES FROM OTHER UTILITIES. IF THESE CLEARANCES CANNOT BE MAINTAINED, THEN PROVISIONS FOR PROPERLY ENCASING THE PIPE IN CONCRETE MUST BE PROVIDED.
16. LATERALS SHALL BE 6 INCHES IN DIAMETER, WITH VERTICAL CLEANOUTS OF 6 INCHES IN DIAMETER, AND TO HAVE A MINIMUM OF 3' OF COVER FROM SUSSEX COUNTY CLEANOUT TO MAIN LINE.
17. ALL GRAVITY SEWER PIPES SHALL BE PVC SDR 35. FOR PIPE SLOPES SEE FINAL CONSTRUCTION DRAWINGS FOR SANITARY SEWER PROFILES.
18. MATERIAL OF CONSTRUCTION FOR SEWER FORCE MAINS SHALL BE AS NOTED ON THE FINAL CONSTRUCTION DRAWINGS. FORCE MAIN SHALL BE INSTALLED AS PROFILED TO PREVENT FORMATION OF UNANTICIPATED HIGH POINTS IN THE INSTALLATION.
19. ALL SEWER LINES MUST BE SUCCESSFULLY TESTED ACCORDING TO SUSSEX COUNTY ORDINANCE 38, SECTION 5.04, E, 1-4, ON PAGE 515 THROUGH 518, ACCEPTANCE TESTING, PRIOR TO FINAL ACCEPTANCE.
20. ALL SANITARY SEWER SYSTEM CONSTRUCTION PERFORMED SHALL BE IN ACCORDANCE WITH SUSSEX COUNTY ORDINANCE 38, THESE PLANS AND ALL APPLICABLE CONSTRUCTION PERMITS.
21. ALL DROP MANHOLES TO BE 5'-0" IN DIAMETER.
22. FITTINGS SHOWN ON THE PLANS ILLUSTRATE ANTICIPATED ANGLE OF DEFLECTION. THIS INFORMATION IS SHOWN FOR GENERAL INFORMATION AND IS NOT GUARANTEED. ACTUAL ANGLE MAY VARY DUE TO FIELD CONDITIONS. USE OF ADDITIONAL FITTINGS SHALL BE AUTHORIZED BY THE ENGINEER.
23. THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR ANY DEVIATION FROM THESE PLANS UNLESS WRITTEN APPROVAL HAS BEEN PROVIDED BY THE ENGINEER.
24. ALL DISTURBED AREAS IN THE STATED RIGHT OF WAY, BUT NOT IN THE PAVEMENT SECTION MUST BE TOPSOILED (6" MINIMUM), FERTILIZED, MULCHED, AND SEEDED.
25. ALL PAVEMENT MARKINGS AND SIGNAGE SHALL BE PLACED IN ACCORDANCE WITH THE M.U.T.C.D. MANUAL, MOST CURRENT EDITION.
26. ALL PROPOSED STORM DRAIN DESIGNATED AS "RCCP" IS TO BE REINFORCED CONCRETE CIRCULAR PIPE, MEETING AASHTO M-170 SPECIFICATIONS. SEE FINAL CONSTRUCTION PLAN & PROFILES FOR SPECIFIC PIPE CLASS.
27. ALL LENGTHS OF SANITARY SEWER PIPE ARE MEASURED HORIZONTALLY FROM CENTER LINES OF INLETS, MANHOLES OR FITTINGS. ALL LENGTHS OF STORM DRAIN PIPE ARE MEASURED HORIZONTALLY FROM EDGE OF STRUCTURE TO EDGE OF STRUCTURE. ACTUAL TRUE LENGTHS OF PIPES ARE TO BE DETERMINED IN THE FIELD.
28. WHERE SPECIFIED, HDPE STORM DRAIN PIPE SHALL BE ADS N-12 (SMOOTH INTERIOR) PIPE WITH ADS PRO-LINK NT (BELL&BELL COUPLER) FOR WATER TIGHT CONNECTIONS. REFER TO PLAN AND PROFILES FOR MATERIALS USED.
29. ALL EMBEDMENT MATERIALS USED FOR BEDDING, HAUNCHING, AND INITIAL BACKFILL FOR HDPE PIPE SHALL CONFIRM TO AASHTO SECTION 30 AND ASTM D-2321 AS PER MANUFACTURER INSTALLATION REQUIREMENTS. CONTRACTOR SHALL ENSURE THAT PROPER LINE AND GRADE IS ESTABLISHED WITHIN TRENCH BEDDING PRIOR TO PLACEMENT OF PIPE AND THAT PROPER MATERIALS ARE USED AND COMPACTION IS ACHIEVED DURING HAUNCHING AND INITIAL BACKFILL. A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO VERIFY SUITABILITY OF MATERIALS USED AND PROPER COMPACTION. ANY DEVIATION IN LINE AND GRADE OR OBVIOUS JOINT SEPARATION SHALL BE CORRECTED PRIOR TO ESTABLISHMENT OF FINAL SUBGRADE AND PAVEMENT SURFACE. THE CONTRACTOR SHALL TAKE EVERY CARE TO ENSURE CORRECT PIPE INSTALLATION.
30. UNLESS OTHERWISE SPECIFIED ALL ROADWAY INLETS SHALL HAVE A TYPE I INLET GRATE AND TYPE S TOP UNIT PER DELDOT STANDARDS, CURRENT REVISION.
31. IT IS THE CONTRACTORS RESPONSIBILITY TO INSURE THAT PAVING IS INSTALLED TO THE ELEVATIONS SHOWN AND THAT NO PONDING OF WATER EXISTS AFTER PAVING IS COMPLETE.

SUSSEX COUNTY CONSTRUCTION NOTES:

1. ROADWAY STAKEOUTS:
   - A. RIGHT-OF-WAY STAKES SHALL BE OFFSET A MINIMUM OF FIVE (5) FEET OUTSIDE THE RIGHT-OF-WAY.
   - B. STATION NUMBERS TO BE INDICATED ON EACH SIDE OF THE STAKE.
   - C. THE CENTERLINE ROADWAY CUT AND CUT-LINE SHALL BE LOCATED ON THE SIDE OF THE STAKE WHICH FACES THE CENTERLINE, ALSO A "CL" DESIGNATION SHALL BE INCLUDED.
   - D. THE SWALE CUT AND CUT-LINE SHALL BE INDICATED ON THE OUTSIDE OF THE STAKE, WHILE ALSO CONTAINING A "SW" DESIGNATION.
2. THE CONTRACTOR SHALL PROVIDE TWO (2) WORKING DAYS NOTICE TO THE COUNTY INSPECTOR PRIOR TO PAVING. AT THIS TIME, THE INSPECTOR MAY REQUIRE THE CONTRACTOR COMPLETE RELATED OR UNRELATED WORK ITEMS BEFORE PAVING MAY BEGIN.
3. SURFACE TREATMENT SHALL NOT BE APPLIED: (SURFACE TREATMENT NOT USED)
   - A. AFTER NOVEMBER 1 OR PRIOR TO APRIL 1; OR
   - B. WHEN THE TEMPERATURE IS BELOW 50° F; OR
   - C. ON ANY WET OR FROZEN SURFACE.
4. HOT MIX SHALL NOT BE APPLIED:
   - A. WHEN THE TEMPERATURE IS BELOW 40° F; OR
   - B. ON ANY WET OR FROZEN SURFACE.
5. FOR ALL WOODED AREAS, A SUFFICIENT AREA BEYOND THE RIGHT-OF-WAY SHALL BE CLEARED AND GRUBBED TO ALLOW PROPER GRADING OF THE ROADWAY SWALE BACKSLOPES.
6. ALL DISTURBED AREAS MUST BE STABILIZED WITH 4 INCHES OF TOPSOIL, SEED, AND MULCH.

DELDOT RECORD PLAN NOTES:

1. NO LANDSCAPING SHALL BE ALLOWED WITHIN DELDOT MAINTAINED R/W UNLESS THE PLANS ARE COMPLIANT WITH SECTION 3.7 OF THE DEVELOPMENT COORDINATION MANUAL (DCM).
2. ALL ENTRANCES SHALL CONFORM TO THE DELAWARE DEPARTMENT OF TRANSPORTATION'S (DELDOT'S) CURRENT DEVELOPMENT COORDINATION MANUAL (DCM) AND SHALL BE SUBJECT TO ITS APPROVAL.
3. SHRUBBERY, PLANTINGS, SIGNS AND/OR OTHER VISUAL BARRIERS THAT COULD OBSTRUCT THE SIGHT DISTANCE OF A DRIVER PREPARING TO ENTER THE ROADWAY ARE PROHIBITED WITHIN THE DEFINED DEPARTURE SIGHT TRIANGLE AREA ESTABLISHED ON THIS PLAN. IF THE ESTABLISHED DEPARTURE SIGHT TRIANGLE AREA IS OUTSIDE THE RIGHT-OF-WAY OR PROJECTS ONTO AN ADJACENT PROPERTY OWNER'S LAND, A SIGHT EASEMENT SHOULD BE ESTABLISHED AND RECORDED WITH ALL AFFECTED PROPERTY OWNERS TO MAINTAIN THE REQUIRED SIGHT DISTANCE.
4. UPON COMPLETION OF THE CONSTRUCTION OF THE SIDEWALK OR SHARED-USE PATH ACROSS THIS PROJECT'S FRONTAGE AND PHYSICAL CONNECTION TO ADJACENT EXISTING FACILITIES, THE DEVELOPER, THE PROPERTY OWNERS OR BOTH ASSOCIATED WITH THIS PROJECT, SHALL BE RESPONSIBLE TO REMOVE ANY EXISTING ROAD TIE-IN CONNECTIONS LOCATED ALONG ADJACENT PROPERTIES, AND RESTORE THE AREA TO GRASS. SUCH ACTIONS SHALL BE COMPLETED AT DELDOT'S DISCRETION, AND IN CONFORMANCE WITH DELDOT'S SHARED-USE PATH AND/OR SIDEWALK TERMINATION POLICY.
5. SUBDIVISION STREETS CONSTRUCTED WITHIN THE LIMITS OF THE RIGHT-OF-WAY ARE PRIVATE AS SHOWN ON THIS PLAN AND ARE TO BE MAINTAINED BY THE DEVELOPER, HOMEOWNERS ASSOCIATION OR BOTH. THE STATE OF DELAWARE ASSUMES NO MAINTENANCE RESPONSIBILITIES FOR THE FUTURE MAINTENANCE OF THESE STREETS.
6. THE SIDEWALK AND SHARED-USE PATH SHALL BE THE RESPONSIBILITY OF THE DEVELOPER, THE PROPERTY OWNERS OR BOTH WITHIN THIS SUBDIVISION. THE STATE OF DELAWARE ASSUMES NO RESPONSIBILITY FOR THE FUTURE MAINTENANCE OF THE SIDEWALK AND/OR SHARED-USE PATH.
7. A.L. LOTS SHALL HAVE ACCESS ONLY FROM THE INTERNAL SUBDIVISION STREETS.
8. DRIVEWAYS WILL NOT BE PERMITTED TO BE PLACED AT CATCH BASIN LOCATIONS.
9. THE DEVELOPER SHALL BE REQUIRED TO FURNISH AND PLACE RIGHT-OF-WAY MONUMENTS IN ACCORDANCE WITH DELDOT'S DEVELOPMENT COORDINATION MANUAL.
10. THE DEVELOPER SHALL BE REQUIRED TO FURNISH AND PLACE RIGHT-OF-WAY MARKERS TO PROVIDE A PERMANENT REFERENCE FOR RE-ESTABLISHING THE RIGHT-OF-WAY AND PROPERTY CORNERS ON LOCAL AND HIGHER ORDER FRONTAGE ROADS. RIGHT-OF-WAY MARKERS SHALL BE SET AND/OR PLACED ALONG THE FRONTAGE ROAD RIGHT-OF-WAY AT PROPERTY CORNERS AND AT EACH CHANGE IN RIGHT-OF-WAY ALIGNMENT IN ACCORDANCE WITH SECTION 3.2.4.2 OF THE DEVELOPMENT COORDINATION MANUAL.

PROJECT PHASING

PHASE I - 4 YEARS

TOTAL PROJECT BUILDOUT - 4 YEARS
ESTIMATED PROJECT COMPLETION DATE - DECEMBER 2024

THE PROJECT IS BE APPROVED AS A SINGLE PHASE PROJECT, WITH THREE (3) OPERATIONAL BREAKS FOR PURPOSES OF BONDING, BENEFICIAL OCCUPANCY INSPECTION, RELEASE OF USE AND OCCUPANCY PERMITS.

GENERAL NOTES:

1. SUBDIVISION STREETS ARE TO REMAIN PRIVATE AND ARE TO BE CONSTRUCTED IN ACCORDANCE WITH SUSSEX COUNTY REGULATIONS.
2. MAINTENANCE OF THE STREET WITHIN THIS SUBDIVISION WILL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER AND/OR HOME OWNER'S ASSOCIATION. THE STATE AND SUSSEX COUNTY ASSUMES NO RESPONSIBILITY FOR FUTURE MAINTENANCE OF THE STREETS.
3. ACCESS TO ALL LOTS IS TO BE FROM SUBDIVISION STREETS OR DRIVE ACCESS LOOPS.
4. MAINTENANCE OF THE STORM WATER MANAGEMENT AREAS WILL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER AND/OR HOMEOWNER'S ASSOCIATION.
5. THE PROPOSED ENTRANCES/EXITS ARE CONCEPTUAL ONLY AND ARE SUBJECT TO REVIEW AND APPROVAL BY THE DELAWARE DEPARTMENT OF TRANSPORTATION BEFORE A CONSTRUCTION PERMIT IS ISSUED.

SITE DATA

PROJECT TITLE/NAME: TWIN CEDARS

1. TAX PARCEL: 533-11.00-42.00
2. OWNER INFORMATION: TWIN CEDARS, LLC (ATTN: MR. JAMES T. GORDON)
   5427 YORK LANE
   BETHESDA, MD 20814
3. DEVELOPER: BAY DEVELOPERS, LLC
   200 WESTON DRIVE
   DOVER, DE 19904
4. ZONING:
   EXISTING: C-1, CR-1, AND GR
   PROPOSED: GR WITH RPC OVERLAY
5. DEVELOPMENT TYPE: RESIDENTIAL PLANNED COMMUNITY (RPC)
   SINGLE FAMILY DETACHED
   MULTI-FAMILY - APARTMENTS
   MULTI-FAMILY - TOWNHOMES
6. BULK AREA STANDARDS (GR-RPC)

SINGLE FAMILY:	GR ZONE:	PROPOSED BY RPC:
MIN. FRONT YARD	40'	25'
MIN. SIDE YARD	10'	10'
MIN. REAR YARD	10'	10'
MIN. LOT WIDTH	75'	60'
MIN. LOT AREA	10,000 SF	7,500 SF

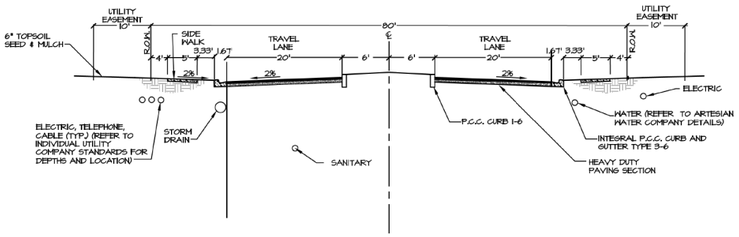
TOWNHOMES:	GR ZONE:	PROPOSED BY RPC:
MIN. FRONT YARD	40'	25'
MIN. SIDE YARD	10'	5'
MIN. REAR YARD	10'	10'
MIN. LOT AREA	1,600 SF	2,310 SF
AVG. LOT AREA	3,630 SF	2,940 SF
MIN. BLDG. SEPARATION	30'	26'

APARTMENTS:	GR ZONE:	PROPOSED BY RPC:
MIN. FRONT YARD	40'	25'
MIN. SIDE YARD	10'	5'
MIN. REAR YARD	10'	10'
MIN. LOT AREA	3,630 SF	3,630 SF

7. LAND USE:
   EXISTING USE: AGRICULTURAL
   PROPOSED USE: RESIDENTIAL
8. PROPOSED DWELLING UNITS:
   MULTI-FAMILY - APARTMENTS 168
   MULTI-FAMILY - TOWNHOMES 44
   SINGLE FAMILY 42
   TOTAL 254 D.U.
9. DEVELOPMENT DENSITY COMPUTATIONS:
   NET SITE AREA:
   TOTAL SITE AREA: 64.32 AC. ±
   PROPOSED ROAD ROW: 4.43 AC. ±
   NET SITE AREA: 58.84 AC. ±
   ALLOWABLE DWELLING UNITS:
   NET SITE AREA * ALLOWABLE DENSITY = ALLOWABLE D.U.
   GR 58.84 AC. X 12.0 D.U. / AC. = 706 D.U.
   PROPOSED DENSITY:
   254 D.U. / 58.84 AC. ± = 4.31 D.U./AC. (NET)
   254 D.U. / 64.32 AC. ± = 3.95 D.U./AC. (GROSS)
10. OPEN SPACE AREAS:
    REQUIRED (SECTION 99.21(D)):
    10% X 64.32 AC ± = 6.43 AC.±
    PROPOSED*:
    PASSIVE: 40.29 AC. ±
    (INCL. NATURAL FOREST & BUFFER AREAS, STORMWATER MANAGEMENT AREAS, ETC.)
    ACTIVE: 1.07 AC. ±
    (INCL. COMMUNITY POOL, RECREATION AREA, & WALKING TRAIL))
    TOTAL PROPOSED 41.36 AC. ±
    (42.57 AC. / 64.32 AC.) = 64 %
    *NOTE: OPEN SPACE CALCULATION INCLUDES 3.93 AC. ± LOCATED WITHIN APARTMENT LOT AREAS.
11. FOREST COVER:

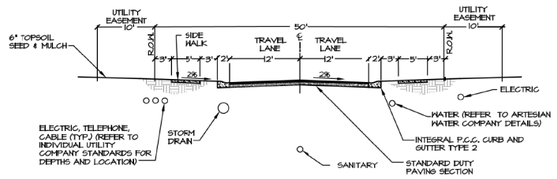
EXIST. FOREST:	58.78 AC. ±
FOREST CLEARED:	10.32 AC. ±
FOREST REMAINING:	28.46 AC. ±
REFORESTATION:	0.00 AC. ±
PROPOSED TOTAL:	28.46 AC. ±

12. WATER SERVICE: PUBLIC (ARTESIAN WATER)
13. SANITARY SEWER: PUBLIC (SUSSEX COUNTY)
14. PARKING ANALYSIS:
    PARKING REQUIRED:
    168 MF - APT X 2 SP/DU = 336 SP
    44 MF - TH X 2 SP/DU = 88 SP
    42 SFD X 2 SP/DU = 84 SP
    TOTAL = 508 SP
    PARKING PROVIDED:
    168 MF - APT X 2 SP/DU = 357 SP
    44 MF - TH X 2 SP/DU = 88 SP
    42 SFD X 2 SP/DU = 84 SP
    CLUBHOUSE AREA = 13 SP
    TOWNHOUSE OVERFLOW = 21 SP
    TOTAL = 563 SP
15. A WETLAND REPORT FOR THE SUBJECT PROJECT AREA WAS PREPARED BY GEO-TECHNOLOGY ASSOCIATES, INC. (GTA) IN MARCH 2021. BASED ON THIS REVIEW, IT IS GTA'S PROFESSIONAL OPINION THAT THERE ARE NO TIDAL WETLANDS OR JURISDICTIONAL NON-TIDAL WETLANDS, INCLUDING "WATERS OF THE U.S.", PRESENT WITHIN THE SUBJECT SITE. JURISDICTIONAL DETERMINATION APPLICATIONS HAVE BEEN FILED WITH DNREC AND ACOE.
16. ALL DROP MANHOLES TO BE 5' OR LARGER IN DIAMETER.
17. ALL FACILITIES TO MEET SUSSEX COUNTY ENGINEERING DEPARTMENT'S STANDARDS AND SPECIFICATIONS.
18. CLEANOUTS TO BE AT EDGE OF ROAD PAVEMENT OR EDGE OF RIGHT-OF-WAY; 6-INCH LATERAL FOR ALL SINGLE FAMILY HOUSES.
19. NO CHURCHES, SCHOOLS, OR COMMERCIAL USE AREAS PROPOSED ON THIS SITE.



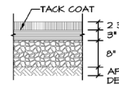
TYPICAL SECTION - ENTRANCE ROAD (80' R.OW.)

NOT TO SCALE



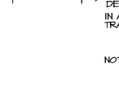
TYPICAL CLOSED SECTION ROAD (50' R.O.W.)

NOT TO SCALE



IN ACCORDANCE WITH DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS-SECTION 401

HEAVY DUTY



IN ACCORDANCE WITH DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS-SECTION 401

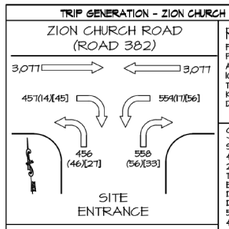
STANDARD DUTY

NOTE: STANDARD DUTY PAVING TO BE USED IN PARKING AREA FOR APARTMENTS

PAVING SECTIONS

NOT TO SCALE

TRIP GENERATION - ZION CHURCH ROAD (S 382) - FULL MOVEMENT



TRAFFIC GENERATION DIAGRAM
TRIPS PER DAY (VEHICLES IN A.M.) [P.M. PEAK HOUR]

ROAD TRAFFIC DATA:
FUNCTIONAL CLASSIFICATION - MAJOR COLLECTOR
POSTED SPEED LIMIT - 50 MPH
AADT =5305 (FROM 2018 DELDOT TRAFFIC SUMMARY)
10 YEAR PROJECTED AADT = 1.18 X 5305 TRIPS = 6,254 TRIPS
TRAFFIC PATTERN GROUP - 8 (FROM 2018 DELDOT TRAFFIC SUMMARY)
K FACTOR = 11.7%
DESIGN HOURLY VOLUME = 6,254 x 11.7% = 720 VPH

SITE TRIPS GENERATED:
SOURCE: ITE TRIP GENERATION MANUAL 10TH EDITION
42 SINGLE FAMILY DETACHED HOUSING (210) = 466 ADT
212 APARTMENTS & TOWNHOMES (220) = 1562 ADT
TOTAL SITE: 2,028 ADT
ENTRANCE I OF I - FULL MOVEMENT
DESIGN VEHICLE: MD-SU
DIRECTIONAL DISTRIBUTION:
55% TO AND FROM THE EAST - 1,117 TRIPS (73 AM PH) [91 PM PH]
45% TO AND FROM THE WEST - 913 TRIPS (60 AM PH) [72 PM PH]

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FAX: (302) 326-2399
WWW.MRAGTA.COM

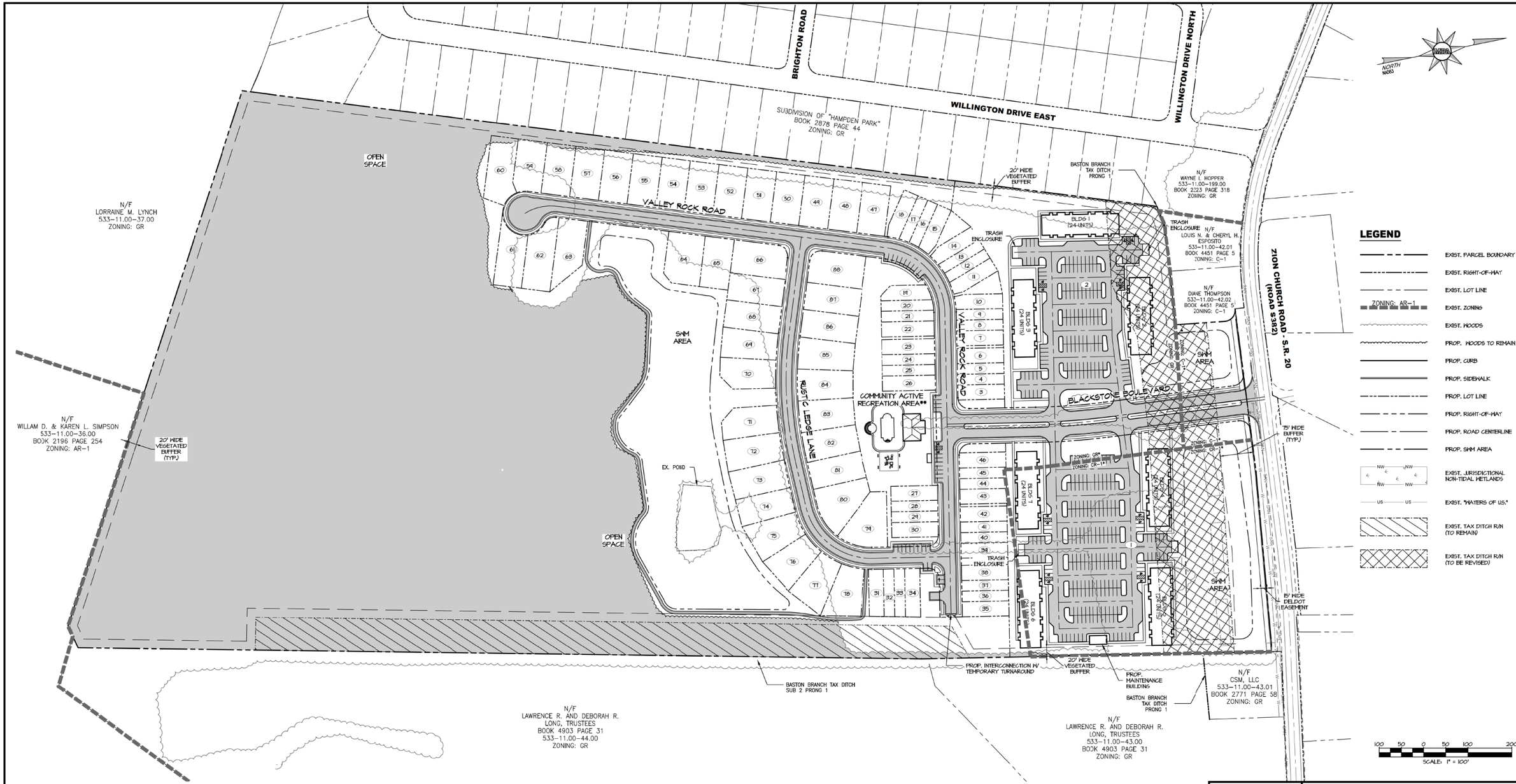
CHRISTOPHER J. FLATHER LICENSE No. 14769 DELAWARE PROFESSIONAL ENGINEER 04/28/21
ENGINEER'S SEAL

GR-RPC
GENERAL NOTES & DETAILS
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS	JOB NO.: 20426
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC	SCALE: AS NOTED
04/27/21	UPDATED WETLANDS INFORMATION	DATE: 10/21/2019
		DRAWN BY: RDG
		DESIGN BY: CJF
		REVIEW BY: PLT
		SHEET: 2 OF 8

G:\20426 - Twin Cedars\PLANNING\PRELIMINARY\PLOT\20426_PRELIM TITLE SHEET.dwg, 4/28/2021 10:48:22 AM, Copyright 2021 Morris & Ritchie Associates, Inc.

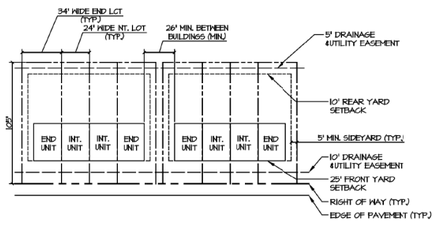


LEGEND

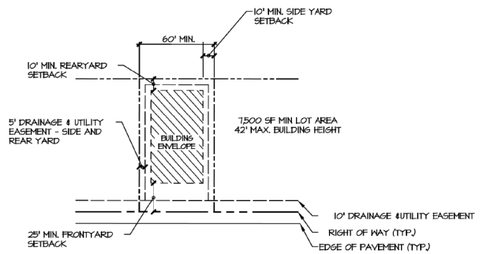
- EXIST. PARCEL BOUNDARY
- EXIST. RIGHT-OF-WAY
- EXIST. LOT LINE
- ZONING: AR-1 — EXIST. ZONING
- EXIST. WOODS
- PROP. WOODS TO REMAIN
- PROP. CURB
- PROP. SIDEWALK
- PROP. LOT LINE
- PROP. RIGHT-OF-WAY
- PROP. ROAD CENTERLINE
- PROP. SWM AREA
- NW NW / NW NW — EXIST. JURISDICTIONAL NON-TIDAL WETLANDS
- US US — EXIST. "WATERS OF US."
- EXIST. TAX DITCH R/W (TO REMAIN)
- EXIST. TAX DITCH R/W (TO BE REVISED)

* NOTE:
ALL EXISTING PORTIONS OF THE SITE CURRENTLY ZONED C-1 OR CR-1 AREAS ON THE SUBJECT PARCEL ARE TO BE REZONED GR BY THIS PLAN.

** NOTE:
THE EXACT SIZE AND CONFIGURATION OF COMMUNITY ACTIVE RECREATION AREA, INCLUDING THE POOL HOUSE, POOL, AND DECKING, SHALL BE DETERMINED DURING THE FINAL ENGINEERING PROCESS AND SHALL BE SHOWN ON A SEPARATE SITE PLAN PREPARED FOR THE SAME.



TYPICAL LAYOUT TOWNHOME
24' WIDE DWELLING UNITS
NOT TO SCALE



TYPICAL LAYOUT SINGLE FAMILY LOT
(VARIABLE WIDTHS)
NOT TO SCALE

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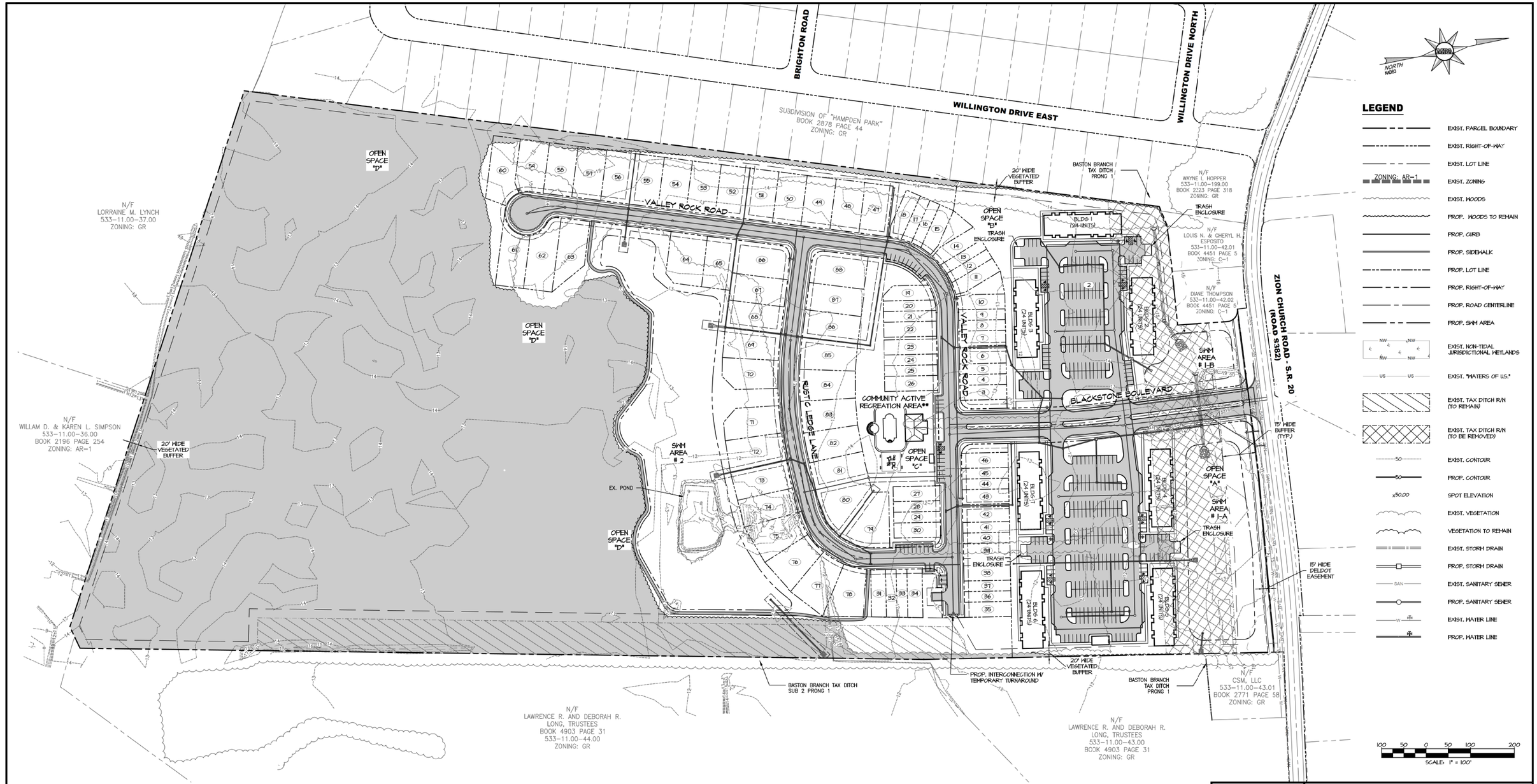
CHRISTOPHER J. FLATTERY LICENSE No. 14707 DELAWARE PROFESSIONAL ENGINEER 10/28/21
ENGINEER'S SEAL

PRELIMINARY PLAN
MASTER GR-R.P.C. PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS	JOB NO.: 20426
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC	SCALE: 1"= 100'
04/27/21	UPDATED WETLANDS INFORMATION	DATE: 10/21/'9
		DRAWN BY: RDG
		DESIGN BY: CJF
		REVIEW BY: PLT
		SHEET: 3 OF 8



PROPOSED OPEN SPACE SUMMARY

AREA	SWM FACILITY	ACTIVE OPEN SPACE	PASSIVE OPEN SPACE*
A	1.41 AC. ±	-	2.15 AC. ±
B	0.43 AC. ±	-	1.78 AC. ±
C	3.47 AC. ±	1.07 AC. ±	37.57 AC. ±
TOTAL	5.31 AC. ±	1.07 AC. ±	41.50 AC. ±

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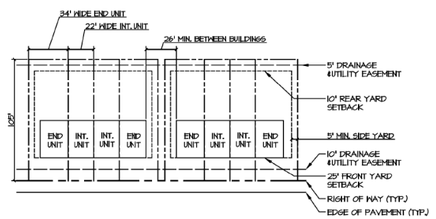
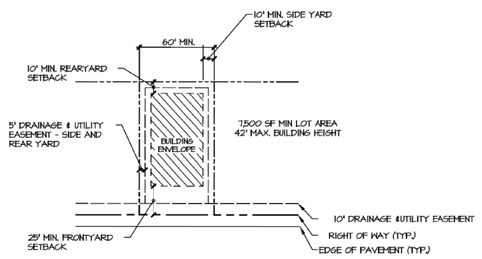


TYPICAL LAYOUT TOWNHOME
24' WIDE DWELLING UNITS
NOT TO SCALE



TYPICAL LAYOUT SINGLE FAMILY LOT
(VARIABLE WIDTHS)
NOT TO SCALE

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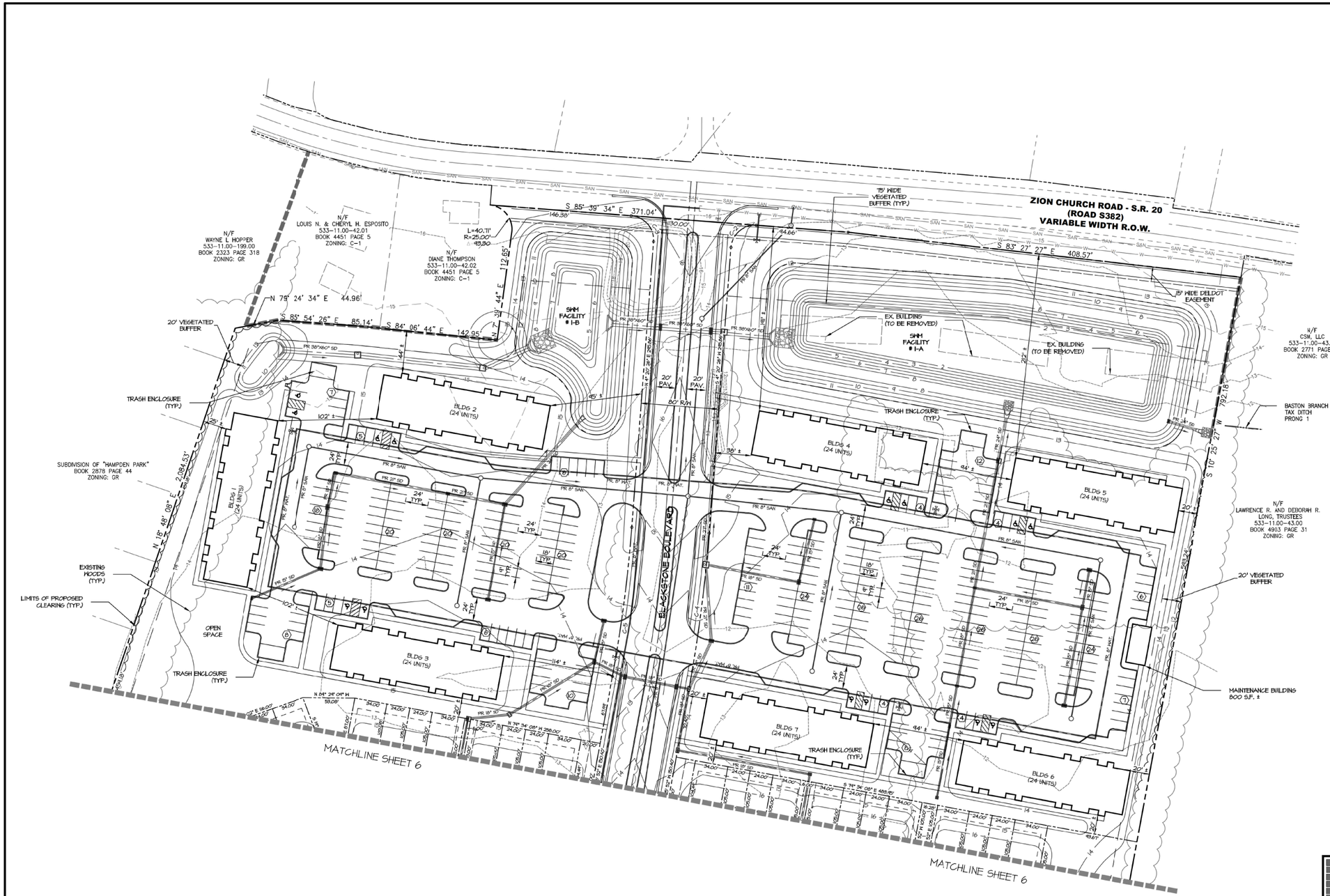
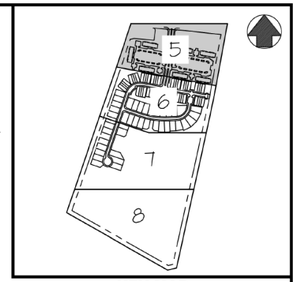
CHRISTOPHER J. FLANNERY LICENSE No. 14781 DELAWARE PROFESSIONAL ENGINEER 04/28/21
ENGINEER'S SEAL

PRELIMINARY PLAN
OVERALL PRELIMINARY PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS	JOB NO.: 20426
03/11/21	EX. PARCEL ZONING / PROP. GR-RPC	SCALE: 1"= 100'
04/27/21	UPDATED WETLANDS INFORMATION	DATE: 10/21/'9
		DRAWN BY: RDG
		DESIGN BY: CJF
		REVIEW BY: PLT
		SHEET: 4 OF 8





KEY MAP
SCALE: 1"=800'

LEGEND

- EXIST. PARCEL BOUNDARY
- EXIST. RIGHT-OF-WAY
- EXIST. LOT LINE
- ZONING: AR-1 — EXIST. ZONING
- EXIST. WOODS
- PROP. WOODS TO REMAIN
- PROP. CURB
- PROP. SIDEWALK
- PROP. LOT LINE
- PROP. RIGHT-OF-WAY
- PROP. ROAD CENTERLINE
- PROP. SHM AREA
- EXIST. WETLANDS
- EXIST. WATERS OF U.S.
- EXIST. TAX DITCH R/W (TO REMAIN)
- EXIST. TAX DITCH R/W (TO BE REMOVED)
- 50 — EXIST. CONTOUR
- 50 — PROP. CONTOUR
- x50.00 — SPOT ELEVATION
- EXIST. VEGETATION
- VEGETATION TO REMAIN
- EXIST. STORM DRAIN
- PROP. STORM DRAIN
- SAN — EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- W — EXIST. WATER LINE
- PROP. WATER LINE

RIGHT-OF-WAY CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-2	25.00'	34.27'	S 44° 20' 26" W	35.36'
C-3	25.00'	34.27'	N 40° 39' 34" W	35.36'
C-4	1540.00'	163.70'	S 07° 23' 04" W	163.63'
C-5	1460.00'	155.20'	N 07° 23' 04" E	155.13'

50 25 0 25 50 100
SCALE: 1" = 50'

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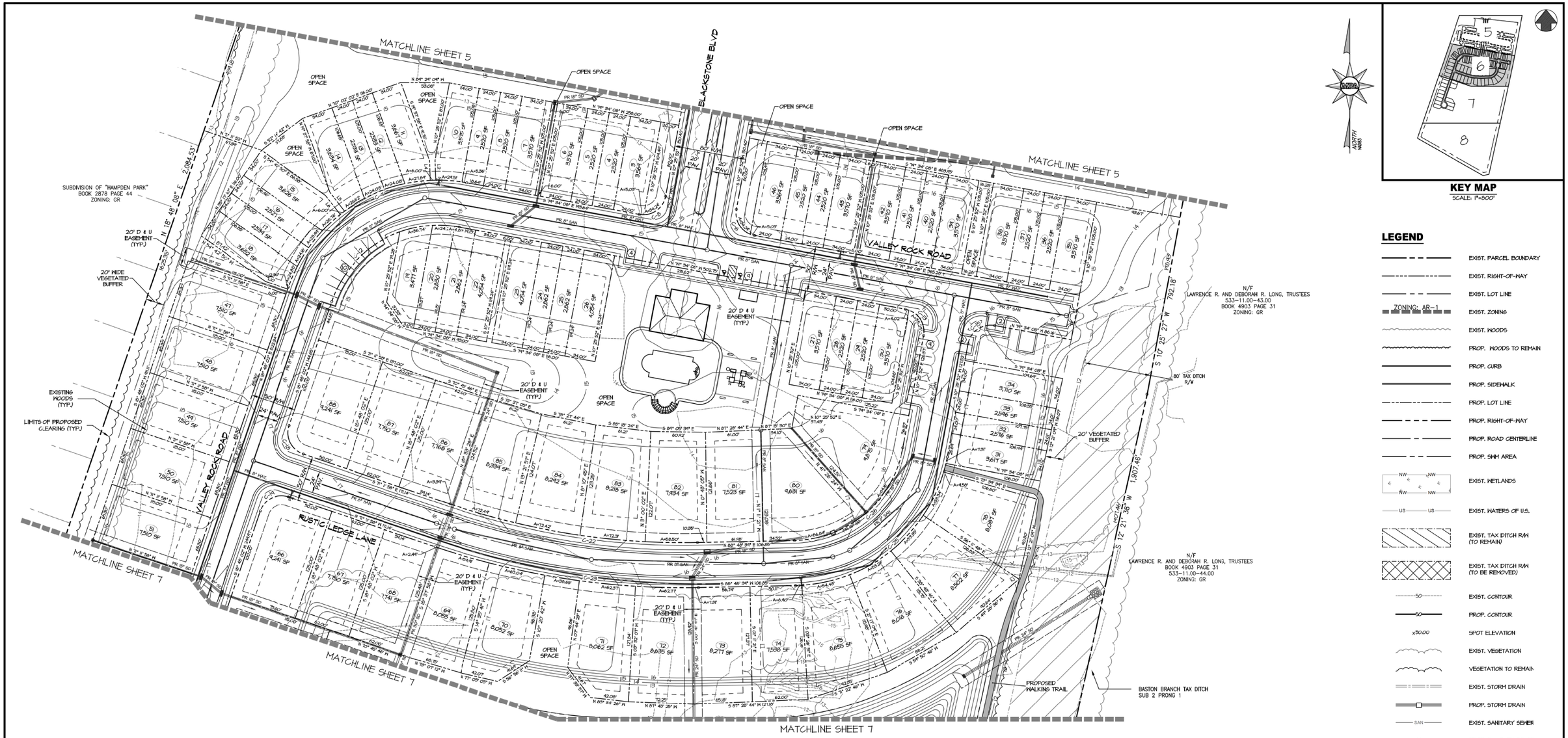
CHRISTOPHER J. FLATTER LICENSE No. 14708 DELAWARE PROFESSIONAL ENGINEER 04/28/21
ENGINEER'S SEAL

GR-RPC
PRELIMINARY PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS	JOB NO.: 20426
03/11/21	REVISED EX. PARCEL ZONING INFO	SCALE: 1"= 50'
04/27/21	UPDATED WETLANDS INFORMATION	DATE: 10/21/2019
		DRAWN BY: RDG
		DESIGN BY: CJF
		REVIEW BY: PLT
		SHEET: 5 OF 8



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- SAN — EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- W — EXIST. WATER LINE
- PROP. WATER LINE

PROPERTY LINE TABLE

LINE	BEARING	DISTANCE
L2	N 01° 58' 07" W	21.98'
L4	S 01° 58' 07" E	21.98'
L5	S 37° 32' 44" E	26.53'
L6	S 37° 32' 44" E	26.53'
L10	S 71° 11' 58" E	26.51'

RIGHT-OF-WAY CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-6	25.00'	34.27'	S 34° 34' 08" E	35.36'
C-8	25.00'	34.27'	N 55° 25' 52" E	35.36'
C-9	175.00'	244.33'	N 54° 36' 57" E	226.77'
C-12	125.00'	116.04'	S 54° 36' 57" W	163.41'
C-13	25.00'	34.27'	N 34° 34' 04" W	35.36'
C-15	25.00'	34.27'	S 55° 25' 52" W	35.36'
C-16	25.00'	34.27'	S 26° 11' 58" E	35.36'
C-19	25.00'	34.27'	S 63° 48' 02" W	35.36'
C-22	800.00'	279.11'	S 81° 11' 34" E	277.64'
C-23	850.00'	246.55'	N 81° 11' 34" W	245.05'
C-25	175.00'	238.25'	S 44° 48' 36" W	220.21'
C-26	125.00'	171.00'	N 44° 37' 16" E	157.97'

50 25 0 25 50 100
SCALE: 1" = 50'

NOTE:
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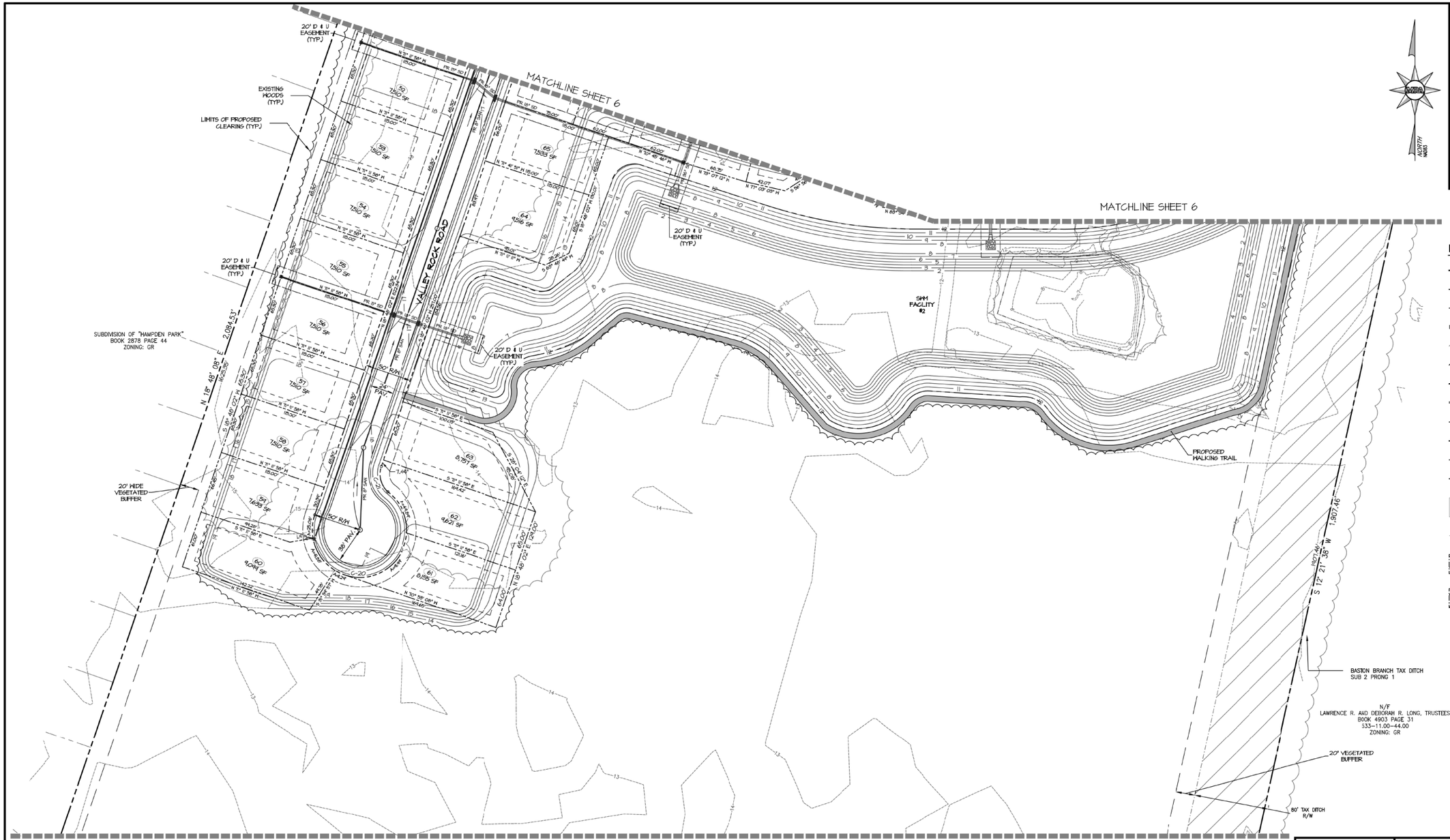
ENGINEER'S SEAL

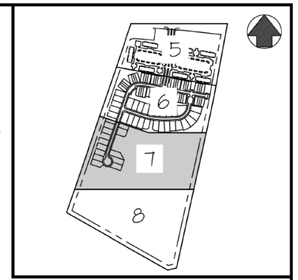
GR-RPC
PRELIMINARY PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS
03/11/21	REVISED EX. PARCEL ZONING INFO
04/27/21	UPDATED WETLANDS INFORMATION

JOB NO.: 20426
SCALE: 1"= 50'
DATE: 10/21/2019
DRAWN BY: RDG
DESIGN BY: CJF
REVIEW BY: PLT
SHEET: 6 OF 8





KEY MAP
SCALE: 1"=800'

LEGEND

- EXIST. PARCEL BOUNDARY
- EXIST. RIGHT-OF-WAY
- EXIST. LOT LINE
- EXIST. ZONING — ZONING: AR-1
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- EXIST. VEGETATION
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- EXIST. STORM DRAIN
- PROP. STORM DRAIN
- EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
- EXIST. WATER LINE
- PROP. WATER LINE

RIGHT-OF-WAY CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-20	50.00'	220.11'	S 72° 35' 33" W	80.78'
C-21	25.00'	24.18'	S 14° 38' 12" E	27.55'

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ENGINEER'S SEAL

GR-RPC PRELIMINARY PLAN
FOR
TWIN CEDARS

BALTIMORE HUNDRED — SUSSEX COUNTY, DELAWARE

DATE	REVISIONS
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JOB NO.: 20426
SCALE: 1"= 50'
DATE: 10/21/2019
DRAWN BY: RDG
DESIGN BY: CJF
REVIEW BY: PLT
SHEET: 7 OF 8

MATCHLINE SHEET 7

MATCHLINE SHEET 7

SUBDIVISION OF "HAMPDEN PARK"
BOOK 2878 PAGE 44
ZONING: GR

N 16° 46' 08" E 2,084.53'

20' VEGETATED BUFFER

N 66° 23' 53" W 1,273.21'

N/F
LORRAINE M. LYNCH
533-11.00-37.00
ZONING: GR

20' WIDE VEGETATED BUFFER

N/F
WILLAM D. & KAREN L. SIMPSON
533-11.00-36.00
BOOK 2196 PAGE 254
ZONING: AR-1

S 76° 26' 25" W 54.01'

ZONING: GR

ZONING: AR-1

BASTON BRANCH TAX DITCH
SUB 2 PRONG 1

S 12° 21' 38" W 1,907.46'

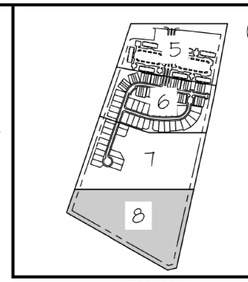
20' VEGETATED BUFFER

80' TAX DITCH R/W

20' VEGETATED BUFFER

N/F
LAWRENCE R. AND DEBORAH R. LONG, TRUSTEES
3OOK 4903 PAGE 31
533-11.00-44.00
ZONING: GR

NORTH
NAD83



KEY MAP
SCALE: 1"=800'

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- PROP. STORM DRAIN
- SAN — EXIST. SANITARY SEWER
- PROP. SANITARY SEWER
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- PROP. WATER LINE

50 25 0 25 50 100
SCALE: 1" = 50'

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
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		DRAWN BY: RDG
		DESIGN BY: CJF
		REVIEW BY: PLT
		SHEET: 8 OF 8

Appendix 5 – PLUS Review Response Letter

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

Date: February 22, 2021

Office of State Planning Coordination
122 Martin Luther King Jr. Blvd. South
Dover, DE 19901

Attention: Ms. Constance C. Holland, Director

Subject: Twin Cedars
PLUS Review 2019-07-05

Dear Ms. Holland:

We are in receipt of your comment letter dated August 21, 2019 with regard to Concept Plan associated with the proposed Twin Cedars residential subdivision proposed in Sussex County and respond as follows:

Strategies for State Policies and Spending

Comment 1: This project is located in Investment Level 3 according to the Strategies for State Policies and Spending. Investment Level 3 reflects areas where growth is anticipated by local, county, and state plans in the longer term future, or areas that may have environmental or other constraints to development. State investments may support future growth in these areas, but may have priorities for the near future. Level 3 area means there may be environmental concerns on or near the parcel and we would encourage you to design the site with respect for the environmental features which are present.

Response: *Comment acknowledged. The project is located within the Sussex County Coastal Area growth zone and has access to public water and sewer infrastructure. Site design, including preservation and protection of existing natural resources, will be performed in accordance with requirements of the Sussex County Code in effect at the time of the Preliminary Plan application.*

Code Requirements/Agency Permitting Requirements

Department of Transportation - Contact Bill Brockenbrough 760-2109

Comment 2: The site access on Zion Church Road (Delaware Route 20) must be designed in accordance with DelDOT's Development Coordination Manual, which is available at https://www.deldot.gov/Business/subdivisions/index.shtml?dc=changes

Response: *Comment acknowledged; the site access will be designed in accordance with the Development Coordination Manual.*

Comment 3: Pursuant to Section P.3 of the Manual, a Pre-Submittal Meeting is required before plans are submitted for review. The form needed to request the meeting and guidance on what will be covered there and how to prepare for it is located at https://deldot.gov/Business/subdivisions/pdfs/Meeting_Request_Form.pdf?08022017

Response: *Comment acknowledged; a Pre-Submittal Meeting with the DelDOT Subdivision Section will be scheduled prior to submittal of plans for review.*

Comment 4: Section P.5 of the Manual addresses fees that are assessed for the review of development proposals. DelDOT anticipates collecting the Initial Stage Fee when the record plan is submitted for review and the Construction Stage Fee when construction plans are submitted for review.

Response: *Comment acknowledged; review fees are anticipated to be provided in accordance with current DelDOT policy.*

Comment 5: Per Section 2.2.2.1of the Manual, Traffic Impact Studies (TIS) are warranted for developments generating more than 500 vehicle trip ends per day or 50 vehicle trip ends per hour in any hour of the day. From the PLUS application, the total daily trips are estimated at 2,030 vehicle trip ends per day. DelDOT calculates a higher number, 2, 051 vehicle trip ends per day, but regardless the warrant for a TIS is met.

On July 30, 2008, DelDOT commented to the County on its review of a TIS for an earlier plan to develop these lands. Having reviewed the attached letter, DelDOT finds that a new TIS, conforming to current DelDOT regulations, is needed to address the plan now proposed. The primary purpose of a TIS is to determine the need for off-site transportation improvements. Without prejudging the results of the TIS, DelDOT expects to require turning lanes at the site entrance and a signal agreement for the intersection of Zion Church Road, Johnson Road aka Bunting Road (Sussex Road 382A) and Bayard Road (Sussex Road 384).

Response: *Comment addressed; the Preliminary TIS report was approved by DelDOT on February 5, 2020. The Final TIS Report was submitted for DelDOT review and approved by DelDOT on July 13, 2020. Recommendations for the TIS approval include site entrance construction, frontage road upgrades to current DelDOT standards, and participation in signal agreement for future improvements at the intersection of Zion Church Road and Johns Road / Bayard Road*

Comment 6: As necessary, in accordance with Section 3.2.5 and Figure 3.2.5-a of the Manual, DelDOT require dedication of right-of-way along the site's frontage on Zion Church Road. By this regulation, this dedication is to provide a minimum of 40 feet of right-of-way from the physical centerline along both roads. The following right-of-way dedication note is required, "An X-foot wide right-of-way is hereby dedicated to the State of Delaware, as per this plat."

Response: *Comment addressed; as shown on the Preliminary Plan, right-of-way dedication for Zion Church Road has been provided along the project frontage to current DelDOT standards. Dedication of this right-of-way will be noted no final Record Plans utilizing DelDOT standard language requirements.*

Comment 7: In accordance with Section 3.2.5.1.2 of the Manual, DelDOT will require the establishment of a l5-foot wide permanent easement across the property frontage on Zion Church Road. The location of the easement shall be outside the limits of the ultimate right-of-way. The easement area can be used as part of the open space calculation for the site. The following note is required, "A 15-foot wide permanent easement is hereby established for the State of Delaware, as per this plat."

Response: *Comment addressed; the requested easement area has been shown on the plan. The Record Plan will include the requested easement note in accordance with DelDOT requirements.*

Comment 8: Referring to Section 3.4.2.1of the Manual, the following items, among other things, are required on the Record Plan:

- A Traffic Generation Diagram. See Figure 3.4.2-a for the required format and content.
- Depiction of all existing entrances within 600 feet of the entrances on Zion Church Road.
- Notes identifying the type of off-site improvements, agreements (signal, letter) contributions and when the off-site improvements are warranted.

Response: *Comment acknowledged; Record Plans will be prepared in and submitted for DelDOT review in accordance with current DelDOT requirements.*

Comment 9: Section 3.5 of the Manual provides DelDOT's requirements with regard to connectivity. The requirements in Sections 3.5.1 through 3.5.3 shall be followed for all development projects having access to state roads or proposing DelDOT maintained public streets for subdivisions. DelDOT supports the proposed extension of Road B.

Response: *Comment addressed; the Preliminary Plan shows the stub of Valley Rock Road (formerly Road "B") to enable a possible future interconnection with the lands to the southeast of the subject development area.*

Comment 10: Section 3.5.4.2 of the Manual addresses requirements for shared-use paths and sidewalks. For projects in Level 1 and 2 Investment Areas, installation of paths or sidewalks along the frontage on State-maintained roads is required. DelDOT anticipates requiring the developer to build Shared Use Paths along their frontage on Zion Church Road.

Response: *Comment addressed; the easement area for a Shared Use Path has been shown on the Preliminary Plan as noted above. The requirement to provide the Shared Use Path will be discussed with the Subdivision Engineer to determine whether construction along the limited frontage area, or payment of the fee in lieu would be a better alternative at this location.*

Comment 11: Referring to Section 3.5.5 of the Manual, existing and proposed transit stops and associated facilities as required by the Delaware Transit Corporation (DTC) or DelDOT shall be shown on the Record Plan.

Response: *Comment acknowledged; the project site is not located along any current DART routes. Therefore, no transit stops or associated facilities are anticipated to be required for this project. We will confirm any changes to this approach with DTC and revise Record Plan accordingly.*

Comment 12: In accordance with Section 3.8 of the Manual, storm water facilities, excluding filter strips and bio swales, shall be located a minimum of 20 feet from the ultimate State right-of-way along Zion Church Road.

Response: *Comment addressed; all SWM areas are shown a minimum of 20' beyond the area of DelDOT Right-of-Way dedication.*

Comment 13: In accordance with Section 5.2.9 of the Manual, the Auxiliary Lane Worksheet should be used to determine whether auxiliary lanes are warranted at the site entrances and how long those lanes should be. The worksheet can be found at https://deldot.gov/Business/subdivisions/index.shtml.

Response: *Comment acknowledged; site entrance will be designed in accordance with current DelDOT requirements. Supporting design calculations will be provided as part of the*

plan review package. Design deviation requests will be submitted for DelDOT consideration in accordance with current DelDOT policy.

Comment 14: In accordance with Section 5.14 of the Manual, all existing utilities must be shown on the plan and a utility relocation plan will be required for any utilities that need to be relocated.

Response: *Comment acknowledged; plans will be developed and submitted for DelDOT review in accordance with current DelDOT requirements.*

Department of Natural Resources and Control - Contact Michael Tholstrup 735-3352

Habitat of Conservation Concern (Site Assessment)

Comment 15: This project parcel was surveyed on September 21, 2006 to search for habitat of conservation concern and to assess the ecological quality of the area. A copy of this report has been included with these comments. During the survey, the forest at this site was determined to be 25 to 75 years of age; however, some individuals were identified that were likely 100 years of age or greater.

Contact the Division of Fish and Wildlife for assistance in identifying, preserving, and managing the existing forest on-site. For technical assistance or to schedule a site visit please contact Katie Kadlubar, Kathryn.Kadlubar@delaware.gov.

Response: *Comment acknowledged; as shown by the Preliminary Plan, a majority of the wooded areas are to remain undisturbed on site. All on-site clearing will be performed in accordance with Sussex County and DNREC regulations.*

Wetland and Forest Preservation

Comment 16: DNREC mapping indicates presence of forested wetlands and hydric soils (Hurlock) which encompass a large portion of the subject parcel.

Response: *Comment acknowledged; as shown by the Preliminary plan, and as noted above, a majority of the wooded areas are to remain undisturbed on site. Disturbance to any wetland areas are anticipated to be performed under the requirements of Army Corps of Engineering (ACOE) Nationwide Permit 27 for the enhancement of the aquatic habitat.*

Comment 17: DNREC botanist, Bill McAvoy, can assist in drafting a list of plants suitable for this site. Bill can be contacted at (302) 735-8668 or William.McAvoy@delaware.gov.

Response: *Comment acknowledged; a Landscape Plan will be developed and certified by a licensed Landscape Architect in accordance with the requirements of the Sussex County Code.*

State Historic Preservation Office - Contact Carlton Hall 736-7400

Comment 18: There are no known archaeological sites or known National Register listed or eligible properties on the parcel. There was a farmstead that disappeared by 1965. There is a suspicious tree spot on the 1937 aerial east of the house that may indicate a cemetery. The soils range from somewhat poorly drained to very poorly drained. There is potential for a mid-19th century archaeological site and possibly a cemetery. Therefore, our office recommends an archaeological survey of the project area. If you have any questions please contact our office for assistance at302-736-7408...

Response: *Comment acknowledged; recommendations for archaeological survey have been noted.*

Comment 19: If any project or development proceeds, the developer should be aware of the Unmarked Human Burials and Human Skeletal Remains Law (Del. C. Title 7, Ch.54). Prior to any demolition or ground-disturbing activities, the developer should hire an archaeological consultant to examine the parcel for archaeological resources, including unmarked human burials or human skeletal remains, to avoid those sites or areas.

Response: *Comment acknowledged; no documented burial sites are known to exist within the project development area.*

Comment 20: If there is federal involvement, in the form of licenses, permits, or funds, the federal agency, often through its client, is responsible for complying with Section 106 of the National Historic Preservation Act (36 CFR 800) and must consider their project's effects on any known or potential cultural or historic resources. For further information on the Section 106 process please review the Advisory Council on Historic Preservation's website at: www.achp.gov

Response: *Comment acknowledged.*

Delaware State Fire Marshall's Office - Contact Duane Fox 259-7037

Comment 21: At the time of formal submittal, the applicant shall provide; completed application, fee, and three sets of plans depicting the following in accordance with the Delaware State Fire Prevention Regulation:

Fire Protection Water Requirements:

- Water distribution system capable of delivering at least 1000 gpm for 1-hour duration, at 20-psi residual pressure is required. Fire hydrants with 800 feet spacing on centers.
- Where a water distribution system is proposed for residential sites, the infrastructure for fire protection water shall be provided, including the size of water mains for fire hydrants

Fire Protection Features:

- All structures over 10,000 Sq. Ft. aggregate will require automatic sprinkler protection installed.
- Buildings occupied as apartments (multi-family living units comprising of 3 or more units) will require automatic sprinkler protection installed.
- Buildings greater than 10,000 sq. ft., 3-stories or more, over 35 feet, or classified as High Hazard, are required to meet fire lane marking requirements
- For townhouse buildings, provide a section I detail and the UL design number of the 2-hour fire rated separation wall on the Site plan
- Show Fire Department Connection location (Must be within 300 feet of fire hydrant), and detail as shown in the DSFPR.
- Show Fire Lanes and Sign Detail as shown in DSFPR

Accessibility:

- All premises, which the fire department may be called upon to protect in case of fire, and which are not readily accessible from public roads, shall be provided with suitable gates and access roads, and fire lanes so that all buildings on the premises are accessible to fire apparatus. The road island at the entrance from the main thoroughfare must be constructed so fire department apparatus may negotiate it...

- Fire department access shall be provided in such a manner so that fire apparatus will be able to locate within 100 ft. of the front door.
- Any dead end road more than 300 feet in length shall be provided with a turn-around or cul-de-sac arranged such that fire apparatus will be able to turn around by making not more than one backing maneuver. The minimum paved radius of the cul-de-sac shall be 38 feet. The dimensions of the cul-de-sac or turn-around shall be shown on the final plans. Also, please be advised that parking is prohibited in the cul-de-sac or turn around.
- The use of speed bumps or other methods of traffic speed reduction must be in accordance with Department of Transportation requirements.
- The local Fire Chief, prior to any submission to our Agency, shall approve in writing the use of gates that limit fire department access into and out of the development or property

Gas Piping and System Information:

- Provide type of fuel proposed, and show locations of bulk containers on plan.

Required Notes:

- Provide a note on the final plans submitted for review to read " All fire lanes, fire hydrants, and fire department connections shall be marked in accordance with the Delaware State Fire Prevention Regulations"
- Proposed Use
- Alpha or Numerical Labels for each building/unit for sites with multiple buildings/units
- Square footage of each structure (Total of all Floors)
- National Fire Protection Association O{FPA) Construction Type
- Maximum Height of Buildings (including number of stories)
- Note indicating if building is to be sprinklered
- Name of Water Provider
- Letter from Water Provider approving the system layout
- Provide Lock Box Note (as detailed in DSFPR) if Building is to be sprinklered
- Provide Road Names, even for County Roads

Response: *Comment acknowledged; plans will be prepared and submitted to the SFMO in accordance with the current Delaware Fire Regulations.*

Sussex County - Contact Rob Davis 302-855-7820

Comment 22: The parcel is within Tier I - Sussex County Unified Sanitary Sewer District and sewer service is available. A sewer system concept evaluation must be requested to define a connection point. The proposal for 254-unit subdivision 64.22 acres is within sewer system design assumptions and sewer capacity can be assumed. A "Use of Existing Infrastructure Agreement" is required and must be approved prior to approval of construction plans. Sussex County Code, Chapter 1 10, requires that the Engineer and/or Developer request a Sewer System Concept Evaluation (SSCE) from the Utility Planning Department for their project by providing the parcel(s) estimated equivalent dwelling units (EDU) for the project, along with payment of $1,000.00 payable to Sussex County Council. The Utility Planning Department will review the parcel(s) and EDU, confirm capacity, provide the connection point and define any additional parcels that must be served as part of the project. Should it be determined that a pump station is required for

the project, additional information may be requested. This information will be conveyed to the engineer and/or developer as well as the Sussex County Public Works department. The Public Works Division will use this information when reviewing construction drawings to verify that the correct connection point is used, and all required parcels are served.

Response: *Comment acknowledged; the SSCE was provided by Sussex County Engineering on September 23, 2019. All required agreements are anticipated to be processed prior to construction plan approval. No sanitary sewer pump stations are anticipated to be required for the proposed Twin Cedars project.*

Comment 23: The proposed development will require a developer installed collection system in accordance with Sussex County standards and procedures.

Response: *Plans will be developed in accordance with Sussex County standards and submitted concurrently to both Sussex County Engineering and the Delaware Department of Natural Resources for ultimate approval of the plans and construction.*

Comment 24: Onetime system connection charges will apply. Please contact the Utility Permits Division at 302 855-7719 for additional information on charges.

Response: *Comment acknowledged; connection charges will be paid in accordance with Sussex County Code requirements.*

Recommendations/Additional Information

This section includes a list of site specific suggestions that are intended to enhance the project. These suggestions have been generated by the State Agencies based on their expertise and subject area knowledge. These suggestions do not represent State code requirements. They are offered here in order to provide proactive ideas to help the applicant enhance the site design, and it is hoped (but in no way required) that the applicant will open a dialogue with the relevant agencies to discuss how the suggestions can benefit the project.

Department of Transportation - Bill Brockenbrough 760-2109

Recommendation 1: The applicant should expect a requirement that any substation and/or wastewater facilities will be required to have access from an internal driveway with no direct access to Zion Church Road.

Response: *Comment acknowledged; no substations or wastewater facilities are anticipated to be constructed by the Developer as part of the proposed Twin Cedars project.*

Recommendation 2: The applicant should expect a requirement that all PLUS and Technical Advisory Committee (TAC) comments be addressed prior to submitting plans for review.

Response: *Comment acknowledged; plans will be submitted to DelDOT with revisions to address TAC and PLUS comments as noted above.*

Recommendation 3: Please be advised that the Standard General Notes have been updated and posted to the DelDOT website. Please begin using the new versions and look for the revision dates of March 21, 2019 and March 25, 2019. The notes can be found at https://www.deldot.gov/Business/subdivisions/.

Response: *Comment acknowledged; plans to be submitted to DelDOT will reference latest General Notes for Record Plans, Entrance Plans, and Maintenance of Traffic Plans.*

Department of Natural Resources and Environmental Control - Contact Michael Tholstrup 735-3352

Habitat of Conservation Concern (Site Assessment)

Recommendation 4: Small animals, such as salamanders have difficulty climbing vertical curbs. DNREC recommends designing the development to exclude curbs is best for these species but if road curbing is part of the design, curbing that allows small animals to climb out of the roadbed (such as Cape Cod curbing) is preferred over steep, vertical curbing.

Response: *Comment acknowledged; all streets will be designed in accordance with State and County design standards. It is anticipated that internal subdivision streets will include rolled curbs to eliminate a vertical barrier to any wildlife that may be crossing proposed road areas.*

Recommendation 5: Avoid installing sewers with grates, which can create hazard for amphibians and reptiles.

Response: *Comment acknowledged; all streets will be designed in accordance with State and County design standards. As such, inlet and grate styles will utilize typical DelDOT details.*

Recommendation 6: Any culverts installed should be open bottom box culverts to allow for natural substrate to remain and in-water passage of aquatic life. Additionally, culverts should be left as wide as possible to ensure that salamanders can travel through them.

Response: *Comment acknowledged; stormwater drainage, including on-site conveyance and stormwater management outfalls will be designed in accordance with State and County Code requirements.*

Recommendation 7: To deter waterfowl from taking up residence in the stormwater ponds, DNREC recommends planting pond perimeters with a mix of native grasses and wildflowers (to be planted in accordance with Sediment and Stormwater Plan requirements and delegated agency approval). In addition to deterring nuisance waterfowl, the native wildflower mix will also serve to attract pollinators like bees and butterflies, and reduce run-off, which can contain pollutants from nearby impervious surfaces.

Response: *Comment acknowledged; buffer areas around the SWM facilities will be planted with materials to discourage waterfowl per SCD recommendations. Plant material selection will be made by licensed Landscape Architect in accordance DNREC Stormwater Section guidelines as well as Sussex County and SCD requirements.*

Wetland and Forest Preservation

Recommendation 8: Given the benefit of trees in erosion control and flood abatement, tree removal for construction activities and stormwater management should be minimized. The site plan should be designed in a way that allows for preservation of as much of this wooded area as feasible.

Response: *Comment acknowledged; tree clearing is anticipated to be limited to those areas necessary for construction of road, residential lots, and infrastructure directly associated with the proposed residential subdivision.*

Recommendation 9: Tree clearing should be restricted to the areas that are absolutely necessary for the footprint of homes and infrastructure.

Response: *Comment acknowledged; tree clearing is anticipated to be limited to those areas necessary for construction of road, residential lots, and infrastructure directly associated with the proposed residential subdivision.*

Recommendation 10: To reduce impacts to nesting birds and other wildlife species that utilize forests for breeding, forest clearing should not occur April 1st to July 31st.

Response: *Comment acknowledged; the developer / contractor will comply with all State and County regulatory requirements related to Nesting/Breeding Birds.*

Recommendation 11: Low spillage lightbulbs (those that reflect light directly downward onto the illuminated area) should be used on roads and homes within 750-feet of the forested wetlands on site. Fluorescent and mercury vapor lighting should not be used.

Response: *Comment acknowledged; cutoff style light fixtures will be utilized throughout the community for the road lighting purposes. It is anticipated that these fixtures will utilize LED technology. Recommendations for any exterior lighting on the proposed residential structures will be shared with potential builders for their consideration.*

Recommendation 12: Green-technology stormwater management is highly recommended. Efforts to mitigate for impervious cover (pervious pavers) should also be implemented where applicable. Avoid diverting surface water from roadways and stormwater facilities into the wetlands on-site. Water quality could be detrimentally affected by run-off which can contain oil and other pollutants, such as fertilizers and other lawn treatments applied by homeowners.

Response: *Comment acknowledged; consideration to green technology / infiltration based SWM practices will be performed during the SWM strategy development. Due to high groundwater table conditions anticipated for the site, the applicability of these practices was anticipated to be severely limited. Runoff from the developed site will be directed to on-site BMPs to the maximum extent practicable. The discharge from the BMPs are anticipated to be directed for off-site conveyance into the existing tax ditch / drainage ways on site to minimize impacts to the on-site wetlands located at the rear of the parcel.*

Recommendation 13: Avoid causing increases or decreases in water levels by maintaining inputs to natural wetlands at pre-construction levels.

Response: *Comment acknowledged; the on-site grading will attempt to maintain the drainage patterns of the undeveloped site. Discharge from the site will utilize techniques to provide for non-erosive discharge from all SWM facilities. Consideration of runoff volumes with regard to input to interior wetlands areas will be given throughout the grading and SWM design for the developed site condition.*

Recommendation 14: Generally, a 100-foot vegetated buffer is sufficiently protective of water quality.

Response: *Comment acknowledged; buffers to wetlands and other natural resources will be provided in accordance with Sussex County Code requirements in effect at the time of the Preliminary Plan application submittal.*

Delaware State Fire Marshall's - Contact Duane Fox259-7037

Recommendation 15: Although not a requirement of the State Fire Prevention Regulations, the Office of the State Fire Marshal encourages home builders to consider the benefits of home sprinkler protection in dwellings. The Office of the State Fire Marshal also reminds home builders that they are obligated to comply with requirements of Subchapter III of Chapter 36 of Title 6 of the Delaware Code which can be found at the following website: http://delcode.delaware.gov/title6/c036/sc03/index.shtml

Response: *Comment acknowledged; recommendation will be shared with home builder for their consideration.*

Recommendation 16: Preliminary meetings with fire protection specialists are encouraged prior to formal submittal. Please call for appointment. Applications and brochures can be downloaded from our website: www.statefiremarshal.delaware.gov, technical services link, plan review, applications or brochures.

State Housing Authority - Contact: Jonathan Adkins-Taswell 739-4263

Recommendation 17: DSHA strongly supports the site plan for 254 units of 168 multi-family apartments on 64.22 acres along Zion Church Road in Sussex County. This would provide Sussex County an excellent opportunity to facilitate a more affordable housing product in the southern Coastal Area. The need for housing affordable to the many county residents who work in this resort economy is acute and well documented. Considering the site's close proximity to the Rt. 54 and north of Selbyville and location within a DSHA-defined "Areas of Opportunity" provides economic opportunity, high performing school district, and supportive infrastructure that help households succeed. This is an excellent location for a more affordable housing product. As a result, DSHA recommends that Sussex County embrace the opportunity to approve this proposal permitting residents to live close to their jobs, as well as, access the resources and benefits this area provides.

Response: *Comment acknowledged.*

Recommendation 18: DSHA encourages a site layout and quality design measures that creates desirable rental units which are vital to any well-balanced community, the intensity of the proposal warrants design measures to create human-scaled, and pedestrian-oriented community. Incorporating attractive streetscapes, community recreation areas, visually appealing facade treatments, significant landscaping and pedestrian-oriented measures will help the proposal to integrate well into the larger coastal area.

Response: *Comment acknowledged; perimeter landscape / forested buffer areas will be provided in accordance with Sussex County requirements. Sidewalks and street trees will be provided along both sides of all subdivision streets. A centrally located community recreation area is to be provided for the benefit of all residents of the Twin Cedars community. It is anticipated that architectural styles utilized throughout the community will be similar in nature to those employed at other nearby communities that have been recently constructed.*

Recommendation 19: If you have any questions or would like more information, please feel free to call me at (302) 739-4263 ext.245 or via e-mail at Jonathan@destatehousing.com.

Response: *Comment acknowledged.*

Sussex County Housing - Contact Brandy Naurman

In addition to the comments above our office has received a letter from Brandy Nauman, Sussex County Housing Coordinator & Fair Housing Compliance Officer. A copy of that letter is enclosed wit this letter.

Response: *Comment acknowledged; information will be shared with developer and home builder for their consideration.*

A Preliminary Plan application has been submitted to Sussex County Department of Planning and Zoning review and approval. If you should require additional information regarding this PLUS application, please contact me to discuss at 302-326-2200.

Very Truly Yours,
MORRIS & RITCHIE ASSOCIATES, INC.

Christopher J. Flathers, P.E.
Senior Project Manager

cc: J. Whitehouse, Sussex County
H. Mast, Bay Developers, LLC
D. Hutt, Esq.
P. Tolliver, MRA
File

Appendix 6 – Web Soil Survey Report

United States Department of Agriculture

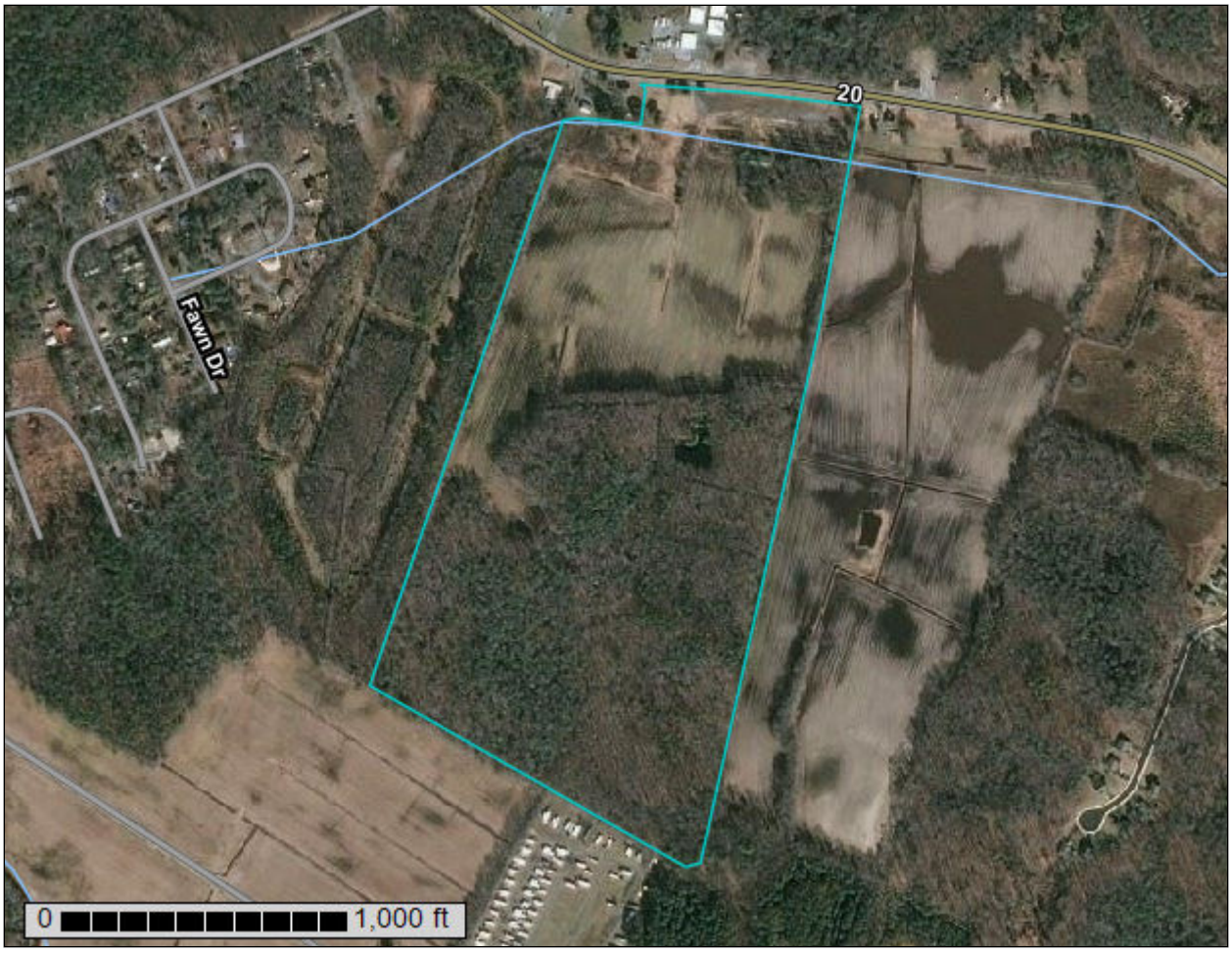
NRCS

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 Sussex County, Delaware

Twin Cedars



May 29, 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

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

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

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.

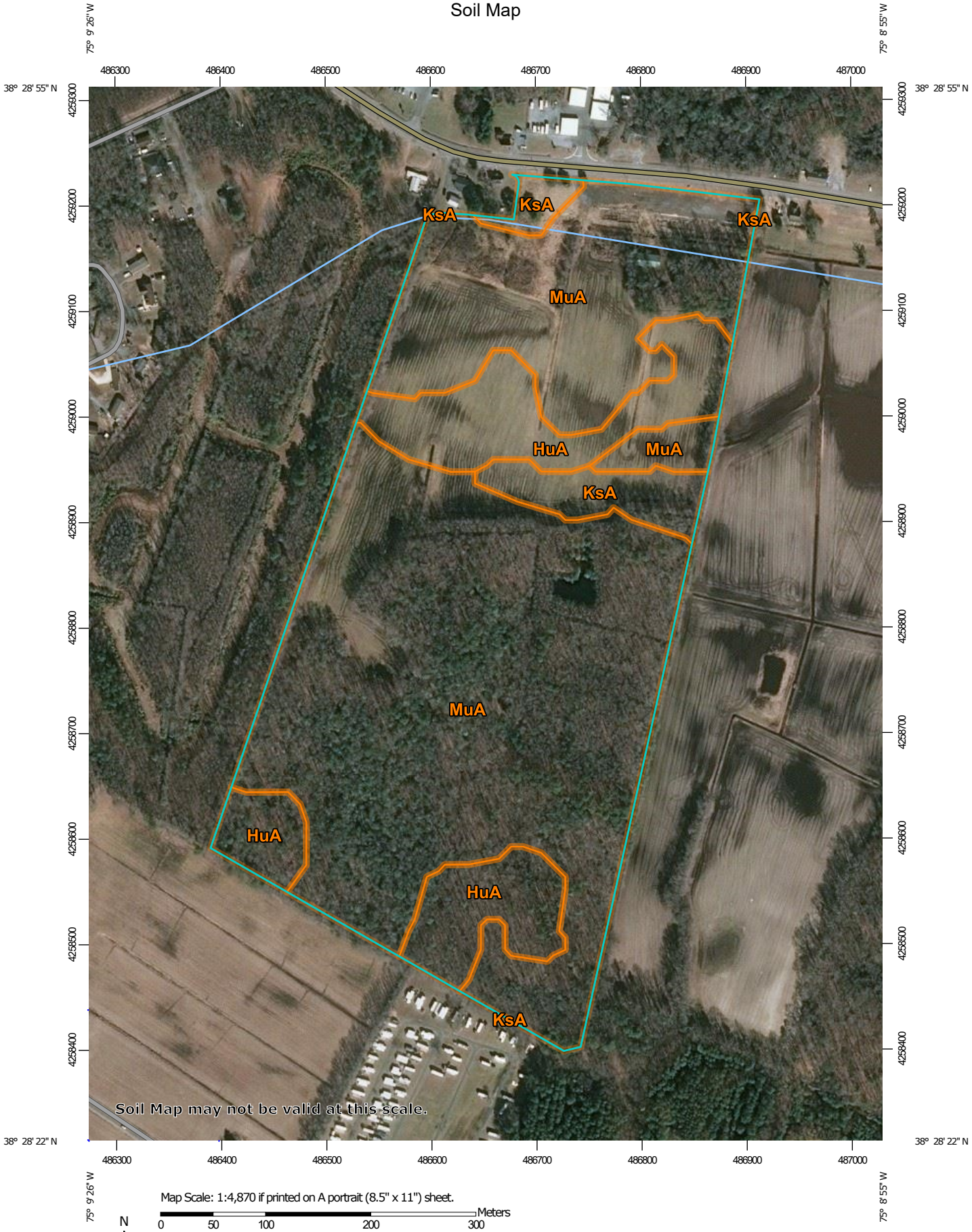
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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: 1:4,870 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

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: Sussex County, Delaware
Survey Area Data: Version 20, Sep 13, 2019

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

Date(s) aerial images were photographed: Nov 21, 2018—Mar 12, 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
HuA	Hurlock loamy sand, 0 to 2 percent slopes	10.5	16.3%
KsA	Klej loamy sand, 0 to 2 percent slopes	3.1	4.8%
MuA	Mullica-Berryland complex, 0 to 2 percent slopes	50.8	78.9%
Totals for Area of Interest		**64.3**	**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 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.

Sussex County, Delaware

HuA—Hurlock loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qth8
Elevation: 0 to 140 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hurlock, undrained, and similar soils: 40 percent
Hurlock, drained, and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hurlock, Undrained

Setting

Landform: Depressions, flats, swales
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loamy fluviomarine sediments

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
A - 3 to 6 inches: loamy sand
Eg - 6 to 13 inches: sandy loam
Btg - 13 to 25 inches: sandy loam
Cg - 25 to 63 inches: loamy sand
2Cg - 63 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Hurlock, Drained

Setting

Landform: Flats, swales, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Loamy fluviomarine sediments

Typical profile

Ap - 0 to 10 inches: loamy sand
Eg - 10 to 13 inches: sandy loam
Btg - 13 to 25 inches: sandy loam
Cg - 25 to 63 inches: loamy sand
2Cg - 63 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 10 to 20 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Klej

Percent of map unit: 5 percent
Landform: Depressions, flats
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Hammonton

Percent of map unit: 5 percent
Landform: Flats, drainageways, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Glassboro

Percent of map unit: 5 percent
Landform: Drainageways, flats
Down-slope shape: Concave, linear
Across-slope shape: Linear
Hydric soil rating: No

Galloway

Percent of map unit: 5 percent
Landform: Flats, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

KsA—Klej loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qthw
Elevation: 0 to 200 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Klej and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Klej

Setting

Landform: Flats, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Sandy eolian deposits and/or fluviomarine sediments

Typical profile

A - 0 to 7 inches: loamy sand
E - 7 to 14 inches: loamy sand
Bw - 14 to 20 inches: loamy sand
C - 20 to 62 inches: loamy sand
Cg - 62 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.57 to 19.98 in/hr)
Depth to water table: About 10 to 20 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Galloway

Percent of map unit: 10 percent
Landform: Flats, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Berryland, drained

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

Hurlock, drained

Percent of map unit: 5 percent
Landform: Swales, flats, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Runclint

Percent of map unit: 5 percent
Landform: Knolls, flats, dunes, fluviomarine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Hammonton

Percent of map unit: 5 percent
Landform: Flats, drainageways, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

MuA—Mullica-Berryland complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qtjb
Elevation: 0 to 100 feet

Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Mullica, drained, and similar soils: 25 percent
Berryland, drained, and similar soils: 25 percent
Berryland, undrained, and similar soils: 15 percent
Mullica, undrained, and similar soils: 15 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mullica, Drained

Setting

Landform: Flats, swales, depressions
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Ap - 0 to 10 inches: mucky sandy loam
A - 10 to 14 inches: mucky sandy loam
Bg - 14 to 24 inches: sandy loam
Cg - 24 to 65 inches: sand
2Ab - 65 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Berryland, Drained

Setting

Landform: Depressions, flats, swales
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits and/or fluviomarine sediments

Typical profile

Ap - 0 to 10 inches: mucky loamy sand
A - 10 to 17 inches: loamy sand
Bh - 17 to 24 inches: loamy sand

C - 24 to 70 inches: sand
2Ab - 70 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Berryland, Undrained

Setting

Landform: Depressions, flats, drainageways, swales
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits and/or fluviomarine sediments

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A1 - 2 to 14 inches: mucky loamy sand
A2 - 14 to 17 inches: loamy sand
Bh - 17 to 24 inches: loamy sand
C - 24 to 70 inches: sand
2Ab - 70 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Mullica, Undrained

Setting

Landform: Flats, drainageways, swales, depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy fluviomarine sediments

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
A - 3 to 10 inches: mucky sandy loam
Eg - 10 to 14 inches: sandy loam
Bg - 14 to 24 inches: sandy loam
Cg - 24 to 65 inches: sand
2Ab - 65 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Klej

Percent of map unit: 10 percent
Landform: Flats, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Askecksy, drained

Percent of map unit: 5 percent
Landform: Depressions, swales, flats
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Galloway

Percent of map unit: 5 percent
Landform: Depressions, flats
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

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.

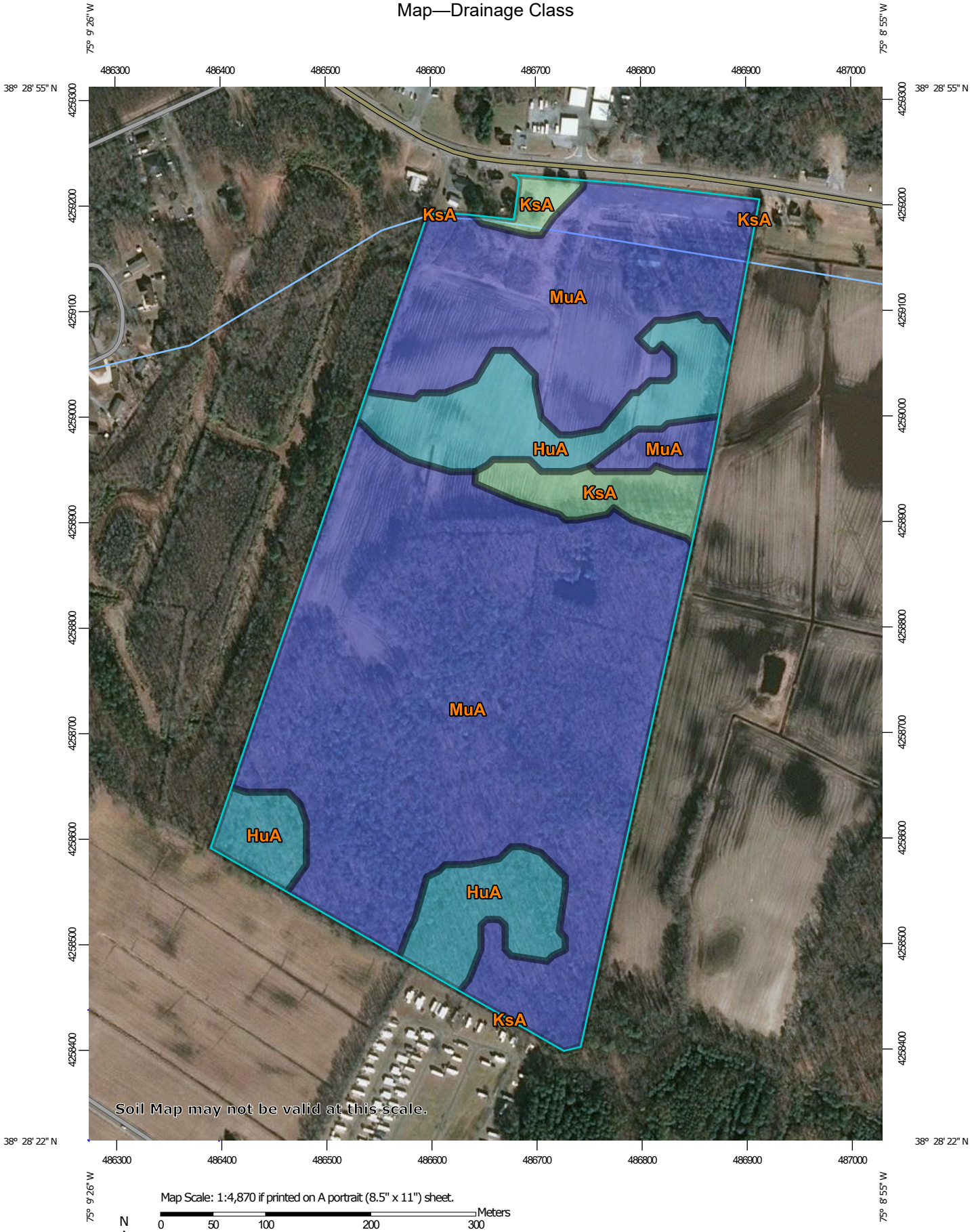
Soil Qualities and Features

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.

Drainage Class

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Custom Soil Resource Report
Map—Drainage Class



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

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: Sussex County, Delaware
Survey Area Data: Version 20, Sep 13, 2019

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

Date(s) aerial images were photographed: Nov 21, 2018—Mar 12, 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.

Table—Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HuA	Hurlock loamy sand, 0 to 2 percent slopes	Poorly drained	10.5	16.3%
KsA	Klej loamy sand, 0 to 2 percent slopes	Somewhat poorly drained	3.1	4.8%
MuA	Mullica-Berryland complex, 0 to 2 percent slopes	Very poorly drained	50.8	78.9%
Totals for Area of Interest			**64.3**	**100.0%**

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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:

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.

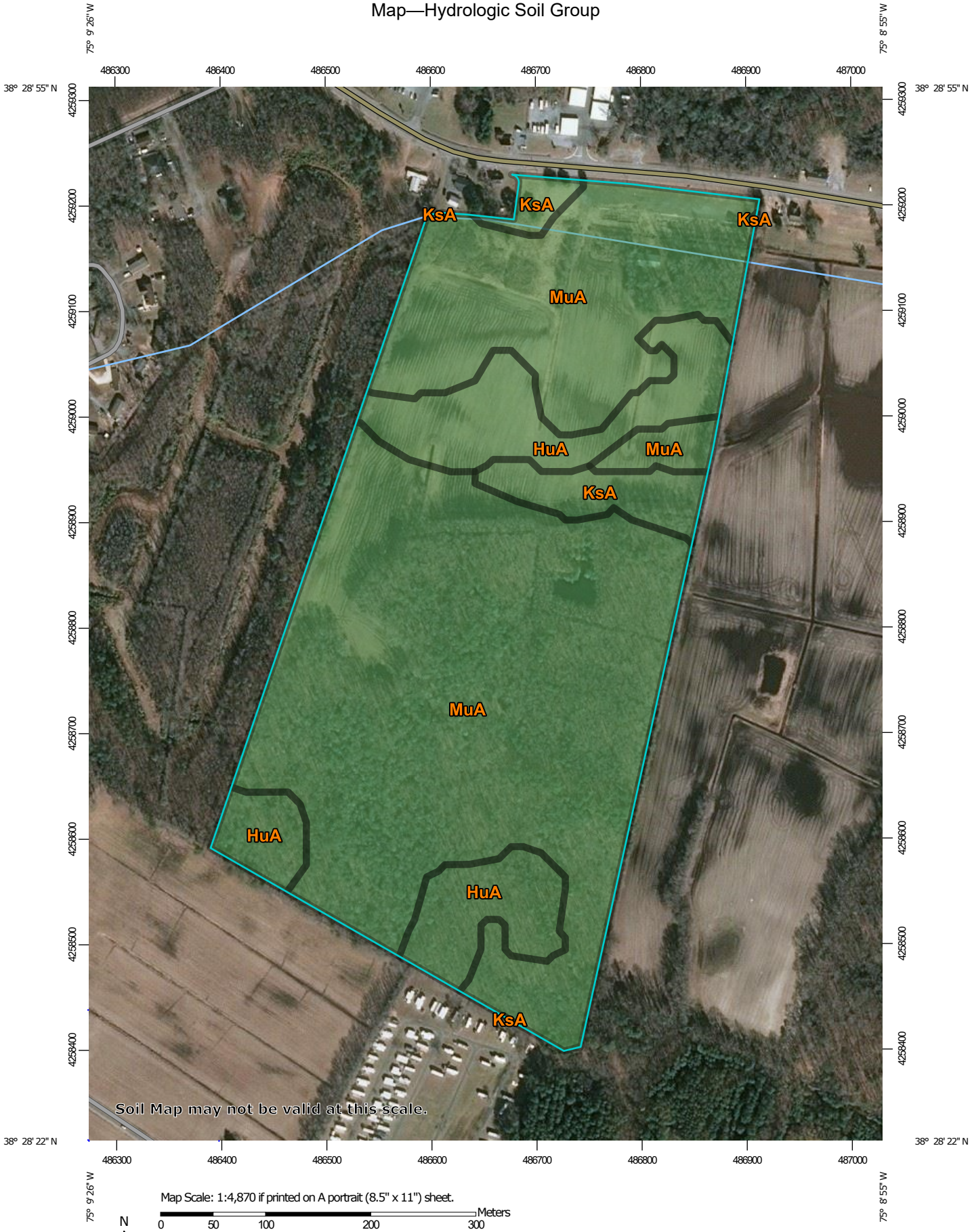
Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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: 1:4,870 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

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: Sussex County, Delaware
Survey Area Data: Version 20, Sep 13, 2019

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

Date(s) aerial images were photographed: Nov 21, 2018—Mar 12, 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.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HuA	Hurlock loamy sand, 0 to 2 percent slopes	A/D	10.5	16.3%
KsA	Klej loamy sand, 0 to 2 percent slopes	A/D	3.1	4.8%
MuA	Mullica-Berryland complex, 0 to 2 percent slopes	A/D	50.8	78.9%
Totals for Area of Interest			**64.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

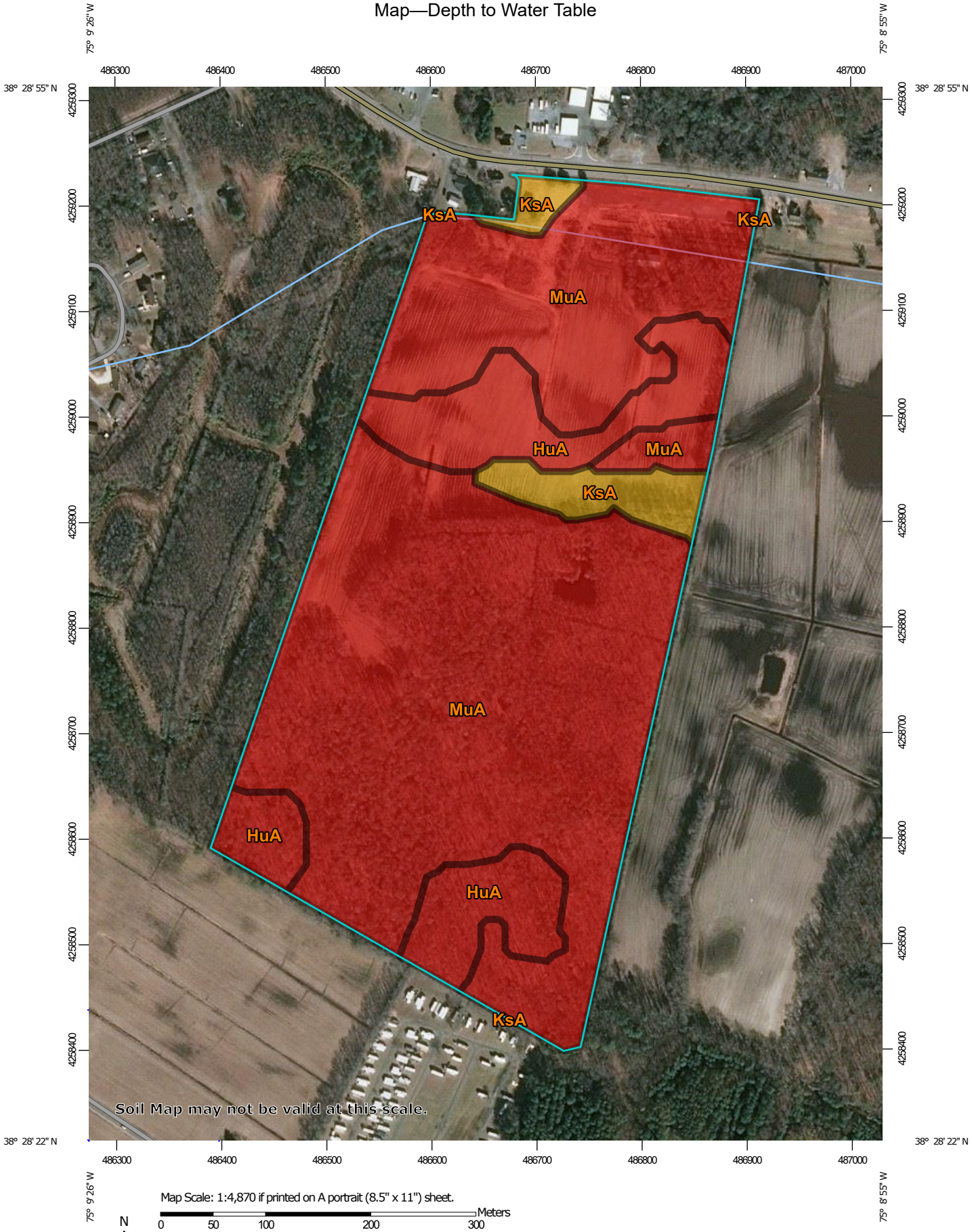
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

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.

Map—Depth to Water Table



Map Scale: 1:4,870 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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 Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

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: Sussex County, Delaware
Survey Area Data: Version 20, Sep 13, 2019

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

Date(s) aerial images were photographed: Nov 21, 2018—Mar 12, 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.

Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
HuA	Hurlock loamy sand, 0 to 2 percent slopes	13	10.5	16.3%
KsA	Klej loamy sand, 0 to 2 percent slopes	30	3.1	4.8%
MuA	Mullica-Berryland complex, 0 to 2 percent slopes	13	50.8	78.9%
Totals for Area of Interest			**64.3**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Building Site Development

This folder contains a collection of tabular reports that present soil interpretations related to building site development. The reports (tables) include all selected map units and components for each map unit, limiting features and interpretive ratings. Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced

concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Dwellings and Small Commercial Buildings

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Dwellings and Small Commercial Buildings–Sussex County, Delaware							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HuA—Hurlock loamy sand, 0 to 2 percent slopes							
Hurlock, undrained	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Hurlock, drained	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
KsA—Klej loamy sand, 0 to 2 percent slopes							
Klej	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
MuA—Mullica-Berryland complex, 0 to 2 percent slopes							
Berryland, drained	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Mullica, drained	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Berryland, undrained	15	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Mullica, undrained	15	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

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Appendix 7 – Wetlands Evaluation

"Wetland Delineation Report", Geo-Technology Associates, Inc., March 31, 2021

WETLAND DELINEATION REPORT

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

March 31, 2021

Prepared For:

BAY DEVELOPERS, LLC
680 Forest Street
Dover, Delaware 19904
Attn: Mr. Henry Mast

Prepared By:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
3445-A Box Hill Corporate Center Drive
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Phone: (410) 515-9446
www.gtaeng.com

GTA Project No: 31190731

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

March 31 2021

Bay Developers, LLC
680 Forest Street
Dover, Delaware 19904

Attn: Mr. Henry Mast

Re: Wetland Delineation Report
Twin Cedars
Sussex County, Delaware

Dear Mr. Mast:

Pursuant to your request, Geo-Technology Associates, Inc. (GTA) has performed a wetland delineation of the above referenced site. The subject site is located south of Zion Church Road in the Selbyville area of Sussex County, Delaware. The subject site encompasses approximately 64.34 acres and is identified as Sussex County Tax Parcel 5-33-11.00-42.00. The purpose of the review was to evaluate the presence and extent of wetlands and/or waterways with respect to Federal and State regulatory authority. This Report and the accompanying *Wetland Delineation Plan* summarize GTA's findings.

We appreciate the opportunity to have been of service to you. If you have questions or require additional information, please contact this office at (410) 515-9446.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.

Matthew Jennette
Senior Project Scientist

T. Andy Stansfield Jr.
Vice President

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WETLAND DELINEATION REPORT
TWIN CEDARS
SUSSEX COUNTY, DELAWARE
MARCH 31, 2021

1.0 INTRODUCTION

The Twin Cedars property (subject site) is located south of Zion Church Road in the Selbyville area of Sussex County, Delaware. The subject site encompasses approximately 64.34 acres and is identified as Sussex County Tax Parcel 5-33-11.00-42.00. A *Site Location Map* depicting the location of the subject site is attached as *Figure 1*. Geo-Technology Associates, Inc. (GTA) has been retained to provide a review and delineation of the subject site's wetlands and/or "waters of the United States."

At the time of GTA's environmental review, the subject site consisted primarily of agricultural fields and wooded areas. The approximate latitude and longitude coordinates of the center of the subject site is 38.478105° and -75.152701° respectively.

2.0 DOCUMENT REVIEW

2.1 Site Plans

GTA personnel utilized a base plan provided by Morris & Ritchie Associates, Inc. (MRA). The base plan identifies existing structures, roads, tree lines, and contours.

2.2 United States Geological Survey Topographic Maps

The United States Geological Survey (USGS), Selbyville, DE Quadrangle, 7.5-minute Topographic Map Series for the area (*Figure 2*) was used as a reference to identify possible waterways within the site. USGS topographic maps identify elevations, streams, ponds, wetlands, and roads. Zion Church Road is depicted north of the subject site. The USGS Topographic Map depicts linear waterways along the eastern, and western edges of the subject site, and within the northern portion of the subject site. The topography depicted on the USGS Topographic Map indicates that the subject site generally drains to the south towards Dirickson Creek. Dirickson Creek is a tributary to Assawoman Bay.

2.3 Soil Survey Information

GTA consulted the U.S. Department of Agriculture, Natural Resources Conservation Service's (NRCS) *Web Soil Survey*[1] to identify the presence of possible hydric soils. The *Web Soil Survey* (*Figure 3*) depicts 3 soil units (*Table 1*) within the subject site. According to the NRCS National Hydric Soils List[2], each of the soil units located within the subject site contain hydric components (*Table 1*).

Table 1: Mapped Soil Units

SYMBOL[1]	NAME/DESCRIPTION[1]	HYDRIC SOIL[2]	HYDRIC COMPONENT[2]	PERCENTAGE OF MAPPING UNIT[2]	POSITION IN LANDSCAPE[2]
HuA	Hurlock loamy sand, 0-2% slopes	Yes	Hurlock, undrained	40	Depressions, Flats, Swales
			Hurlock, drained	40	Flats, Swales, Depressions
KsA	Klej loamy sand, 0-2% slopes	Yes	Hurlock, drained	5	Flats, Depressions, Swales
			Berryland, drained	5	Swales, Flats, Depressions
MuA	Mullica – Berryland complex, 0-2% slopes	Yes	Berryland, drained	25	Depressions, Flats, Swales
			Mullica, drained	25	Flats, Swales, Depressions
			Mullica, undrained	15	Flats, Drainageways, Swales, Depressions
			Berryland, undrained	15	Depressions, Flats, Drainageways, Swales
			Askecksy, drained	5	Depressions, Swales, Flats

2.4 Wetland Indicator Maps

GTA's environmental scientists also consulted digital wetlands data available from the United States Fish and Wildlife Service's (USFWS) National Wetlands Inventory[3] (NWI; *Figure 4*). The NWI wetland map depicts linear riverine systems along the eastern and western

[1] United States Department of Agriculture, Natural Resource Conservation Service, Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov> and accessed on June 13, 2019.
[2] United States Department of Agriculture, Natural Resource Conservation Service. State Soil Data Access (SDA) Hydric Soils List. Available online at < https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316619.html#reportref>. Accessed June 13, 2019.
[3] United States Fish and Wildlife Service, National Wetlands Inventory. Last updated October 9, 2019.

boundaries of the subject site, and within the northern portion of the subject site, which appear to correspond with the waterways depicted on the USGS Topographic Map. Three palustrine wetland systems are depicted within the subject site. The NWI Wetlands Map depicts a palustrine system (PUBHx) within the central portion of the subject site, a palustrine system (PFO1B) within in the southwestern portion of the subject site, and a palustrine system (PFO1C) within the southeastern portion of the subject site. These features are classified by USFWS using the Cowardin system, as detailed in *Table 2*.

Table 2: USFWS NWI Cowardin Designations

SYMBOL[3]	SYSTEM[3]	SUBSYSTEM[3]	CLASS[3]	SUBCLASS[3]	WATER REGIME[3]	SPECIAL MODIFIER
PUBHx	Palustrine (P)	N/A	Unconsolidated Bottom (UB)	N/A	Permanently Flooded (H)	Excavated (x)
R2UBHx	Riverine (R)	Lower Perennial (2)	Unconsolidated Bottom (UB)	N/A	Permanently Flooded (H)	Excavated (x)
PFO1B	Palustrine (P)	N/A	Forested (FO)	Broad-Leaved Deciduous (1)	Seasonally Saturated (B)	N/A
PFO1C	Palustrine (P)	N/A	Forested (FO)	Broad-Leaved Deciduous (1)	Seasonally Flooded (C)	N/A

2.5 Aerial Imagery

GTA reviewed aerial imagery dated 1937, 1954, 1961, 1968, 1992, 1997, 2002, 2005, 2006, 2007, 2009, 2010, 2012, 2013, 2015 and 2017 (*Figure 5*), available from the Delaware Environmental Monitoring and Analysis Center[4] and the National Agricultural Imagery Program. Based on the aerial imagery reviewed by GTA, the subject site appeared to contain apparent agricultural fields and wooded areas since 1937. Apparent ditches are depicted along the eastern, western, northern and central portions of the subject site and appear to extend beyond the subject site. These ditches appear to be consistent with the waterways depicted on the USGS Topographic and the linear riverine systems depicted on the NWI Wetlands Map. Between 1992 and 1997, an apparent open water area was excavated within the central portion of the subject site. This area appears to correlate with the PUBHx system on the NWI Wetlands Map.

[4] Delaware Environmental Monitoring and Analysis Center. Available online at <http://demac.udel.edu/>

3.0 METHODOLOGY

3.1 General Methodology

The purpose of GTA's review was to evaluate the presence and extent of wetlands and waterways with respect to Federal and State jurisdictional authority. GTA based its evaluation on the United States Army Corps of Engineers' (Corps) definition of "waters of the U.S." and "navigable waters of the U.S.," which are defined in Title 33 Code of Federal Regulations (CFR), Parts 328 and 329. GTA employed the three-parameter approach set forth in the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-01*, dated 1987 (*1987 Manual*) and the Corps *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0),* dated November, 2010 (*Supplement*) as a reference for delineating wetlands. The methodology of wetland delineation included identifying hydric soil, wetland hydrology, and dominant hydrophytic vegetation. GTA also considered other regulated waters of the United States, such as ponds, lakes, streams, and rivers. If these waters were observed on the property, GTA incorporated them into the nontidal wetland delineation and labeled them accordingly.

3.2 Hydrology

The *1987 Manual* defines wetland hydrology as the sum of the total wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation. *The 1987 Manual* further defines areas with evident characteristics of wetland hydrology as those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions. Wetland hydrology exists when a minimum of one primary indicator or two secondary indicators are present. Indicators of wetland hydrology are generally derived from observations of surface water or saturated soils, evidence of recent inundation, evidence of current or recent soil saturation, and evidence from other site conditions or data. Additional evidence of wetland hydrology can also be used with appropriate documentation.

3.3 Vegetation

Hydrophytic vegetation can be defined as plant life growing in water or on a substrate that is at least periodically inundated by water. The USFWS has assigned an indicator status to plants that occur in and around wetlands, describing how often that species is found in a wetland:

Obligate Wetland (OBL): Occur in wetlands with an estimated 99% probability.

Facultative Wetland (FACW): Usually occur in wetlands, with an estimated 67%-99% probability.

Facultative (FAC): Equally likely to occur in wetlands and uplands, with an estimated 34%-66% probability of occurring in wetlands.

Facultative Upland (FACU): Usually occur in uplands, with an estimated 67%-99% probability of occurring in uplands.

Obligate Upland (UPL): Occur in uplands with an estimated 99% probability.

For vegetation within a community to be determined hydrophytic in accordance with the *Supplement,* it must pass the Dominance Test, where more than 50% of the dominant plant species observed must have the indicator statuses OBL, FACW, and FAC. If the vegetation observed in the community fails the Dominance Test and indicators of wetland hydrology and hydric soils are present, the Prevalence Index should be applied. Hydrophytic vegetation is present if a Prevalence Index of 3.0 or less is determined.

3.4 Soils

A hydric soil is defined as a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions (*Supplement*). According to the *Supplement,* indicators of hydric soils form mostly from the loss or accumulation of iron, manganese, sulfur, or carbon compounds during saturated and anaerobic conditions.

3.5 On-Site Data Collection

Data Collection Points (DCPs) were established on-site at locations to evaluate the presence of wetlands and waterways, and to demonstrate the typical characteristics of uplands and wetlands. In areas where hydrologic indicators were observed with hydrophytic vegetation,

GTA personnel excavated or augured test pits in the ground to a depth of 20 inches or more to observe features of the soil column. GTA personnel reviewed soil samples from test pits at numbered DCPs in order to describe and classify the soil as either hydric or non-hydric. At these DCPs, GTA personnel also evaluated the surrounding vegetative species and hydrologic indicators. Data Forms were prepared to record observations of the conditions within the wetland and upland areas. Data Forms were also prepared to record data from adjacent upland areas to further support the delineation in the field. The DCPs have been labeled on the *Wetland Delineation Plan* as DCP-1 through DCP-7. Data Forms with reference photographs are included in Appendix B to support the determination depicted on the accompanying *Wetland Delineation Plan* (Appendix D).

3.6 Delineation

In June 2019, GTA's wetland scientists conducted an on-site review to evaluate whether wetlands and/or waterways are present within the subject site. GTA's field delineation consisted of identifying the limits of the wetlands and waterways with pink and black striped flags, numbered sequentially. Wetland flags were hung at the time of GTA's field visits. GTA used the base plan described in *Section 2.1* to navigate the site. Wetland and waterway flag locations were survey located by MRA in September 2019 and are shown on the accompanying *Wetland Delineation Plan* (Appendix D).

4.0 SYSTEMS IDENTIFIED

GTA's wetland scientists identified one system within the subject site. This system is described in the following section:

4.1 System 1: Ditches and Forested Wetlands

System 1 consists of three ditches (Ditches A, B and C) and four forested wetlands (Wetlands 1, 2, 3, and 4). Ditch A is an apparent ditch that originates between Wetlands 1 and 2 and continues east into Ditch B. Ditch B originates from Wetland 2 along the eastern boundary of the subject site and continues northeast along the subject site boundary. Ditch C is located along the northern portion of the subject site parallel to Zion Church Road. According to the *Delaware Tax Ditch Map* provided by the Delaware Department of Natural Resources and

Environmental Control, Delaware Drainage Program (accessed May 21, 2019), Ditch C is identified as the Baston Branch Prong 1 Tax Ditch. The Tax Ditch originates off-site and is enclosed within a culvert pipe through the western portion of the subject site, while the eastern portion of the Tax Ditch is an open channel. Wetland 1 is an open water pond and a palustrine forested wetland located north of Ditch A in the central portion of the subject site. Wetland 2 is a palustrine forested wetland located south of Ditch A and west of Ditch B. Wetland 3 is a palustrine forested wetland that is located in the central portion of the subject site northwest of Ditch A and west of Wetland 1. Wetland 4 is a palustrine forested wetland located on the northeastern corner of the subject site, south of Zion Church Road, adjacent to Ditch C.

Evidence of primary indicators of wetland hydrology included Indicators A1 (surface water) and B9 (water stained leaves). Within these wetlands , GTA's wetland scientists observed predominantly hydrophytic vegetation species including red maple (*Acer rubrum*, FAC), sweetgum (*Liquidambar styraciflua*, FAC), American holly (*Ilex opaca*), sweet pepperbush (*Clethra alnifolia*, FACW), netted chain fern (*Woodwardia areolata*, FACW), Virginia creeper (*Parthenocissus quinquefolia* FACU), trumpet creeper (*Campsis radicans*, FAC), smallspike false nettle (*Boehmeria cylindrica*, FACW), roundleaf greenbriar (*Smilax rotundifolia*, FAC), cat greenbriar (*Smilax glauca*) and sweet woodreed (*Cinna arundinacea*, FACW). GTA personnel excavated test pits to depths of 20 inches or greater within the limits of the wetland boundaries and observed the NRCS and Corps hydric soils field indicators A12 (Thick Dark Surface), S7 (Dark Surface), and F3 (Depleted Matrix). Ordinary high-water marks and defined beds and banks were observed within the limits of Ditches A, B, and C within the subject site.

5.0 OTHER FEATURES

5.1 Agricultural Ditches

Numerous agricultural ditches are located in the northern and central portions of the subject site. In GTA's professional opinion, the agricultural ditches appear to have been excavated from uplands and wholly drains uplands, and; therefore, should not be considered state or federal jurisdictional.

6.0 CONCLUSION

In GTA's professional opinion, the forested palustrine wetlands identified within the subject site exhibited all three wetland parameters. These areas were flagged in the field and are identified on the *Wetland Delineation Plan*.

As a result of the environmental review of the subject site, it is GTA's professional opinion that there are non-tidal wetlands and waterways present within the subject site. Our conclusions regarding this subject site have been based on observations of existing conditions, professional experience in the area with similar projects, and generally accepted professional environmental practice under similar circumstances. Seasonal fluctuations in precipitation or weather conditions can result in differences in the perception of hydrologic conditions, which can alter GTA's evaluation of wetlands/waterways. It is important to note that this delineation is GTA's professional opinion, only. Decisions regarding the official jurisdictional status of wetlands/waterways are made by federal, state and/or local regulatory agencies.

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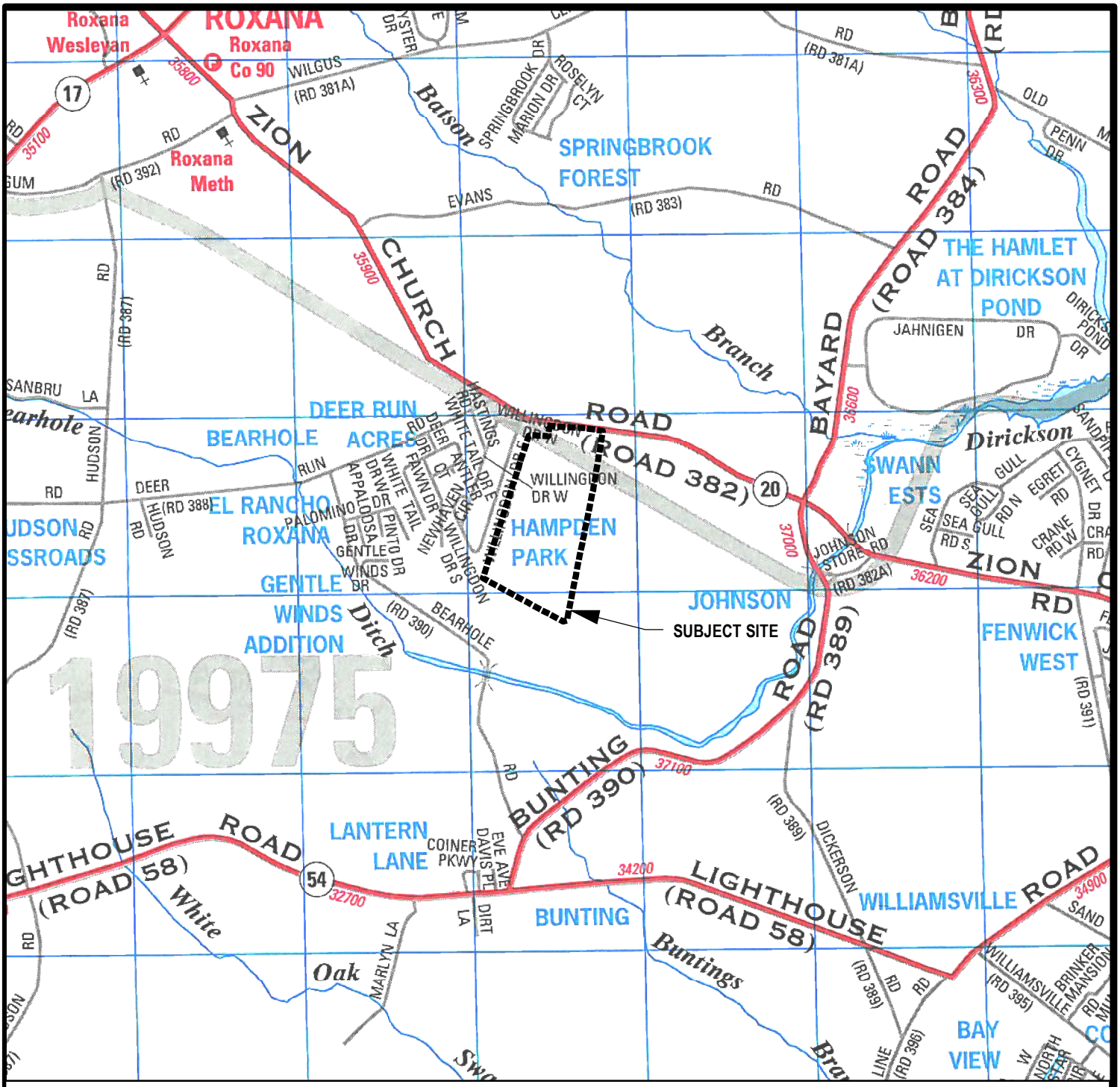
******* END OF REPORT *******

Appendix A:

Figures



SOURCE: MAP COPYRIGHT © ADC THE MAP PEOPLE, (800) 829-6277, PERMITTED USE NUMBER 031282B.

NORTH

0 2,000

APPROXIMATE SCALE
1 INCH = 2,000 FEET

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

SITE LOCATION MAP

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	SCALE	DATE	DRAWN BY	REVIEW BY	FIGURE
31190731	1" = 2,000'	JUNE 13, 2019	TAB	TAS	1

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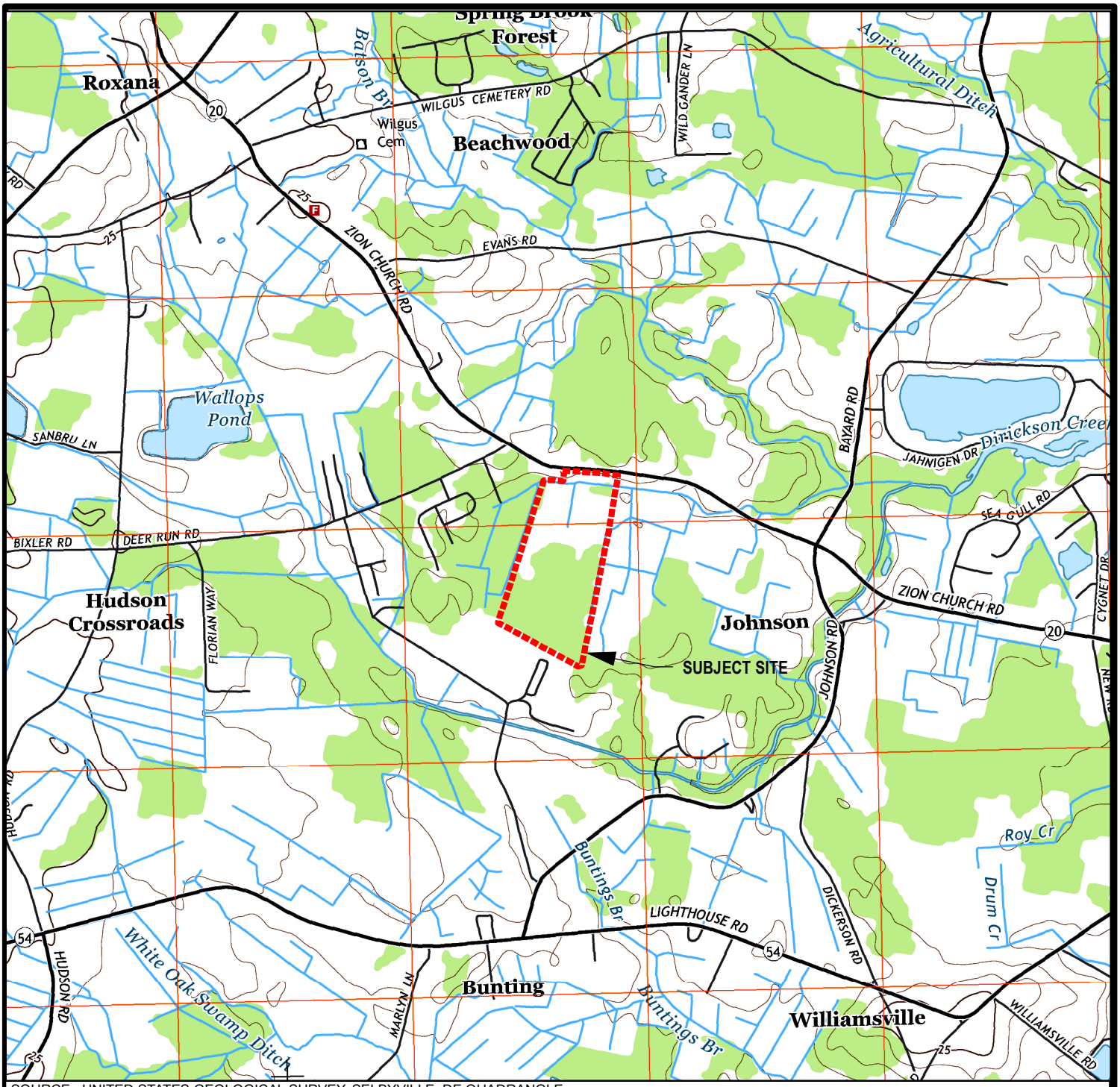

SOURCE: UNITED STATES GEOLOGICAL SURVEY, SELBYVILLE, DE QUADRANGLE, 7.5 MINUTES TOPOGRAPHIC MAP SERIES. DATED 2014.

NORTH

0 2,000

APPROXIMATE SCALE
1 INCH = 2,000 FEET

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USGS TOPOGRAPHIC MAP

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
31190731	1" = 2,000'	JUNE 13, 2019	TAB	TAS	2

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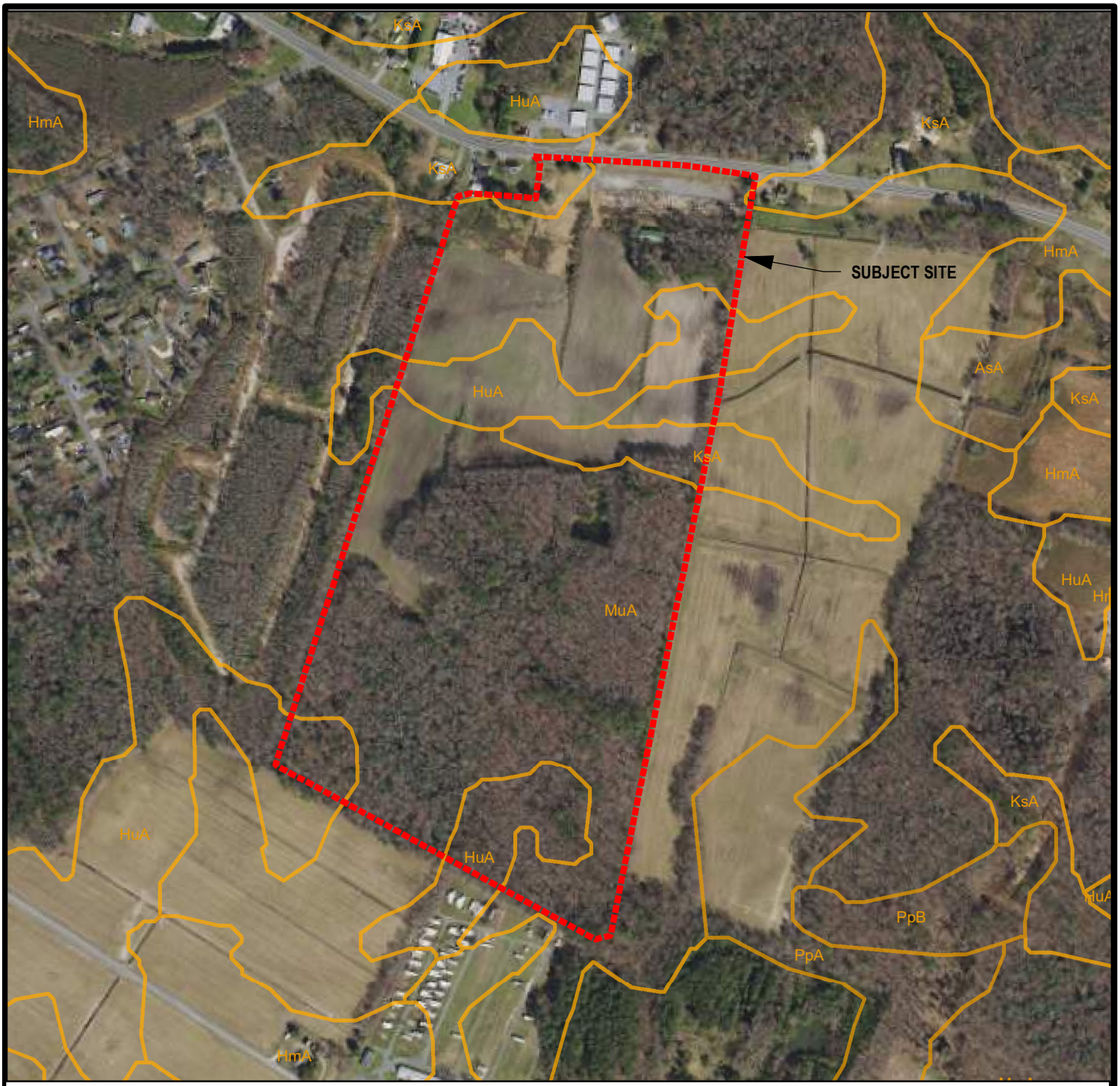

SOURCE: AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. GRIDDED SOIL SURVEY GEOGRAPHIC (gSSURGO) DATABASE FOR DELAWARE. DATED 2018. 2017 BASE AERIAL IMAGERY PROVIDED BY THE NATIONAL AGRICULTURAL IMAGERY PROGRAM.

NORTH

0 500

APPROXIMATE SCALE
1 INCH = 500 FEET

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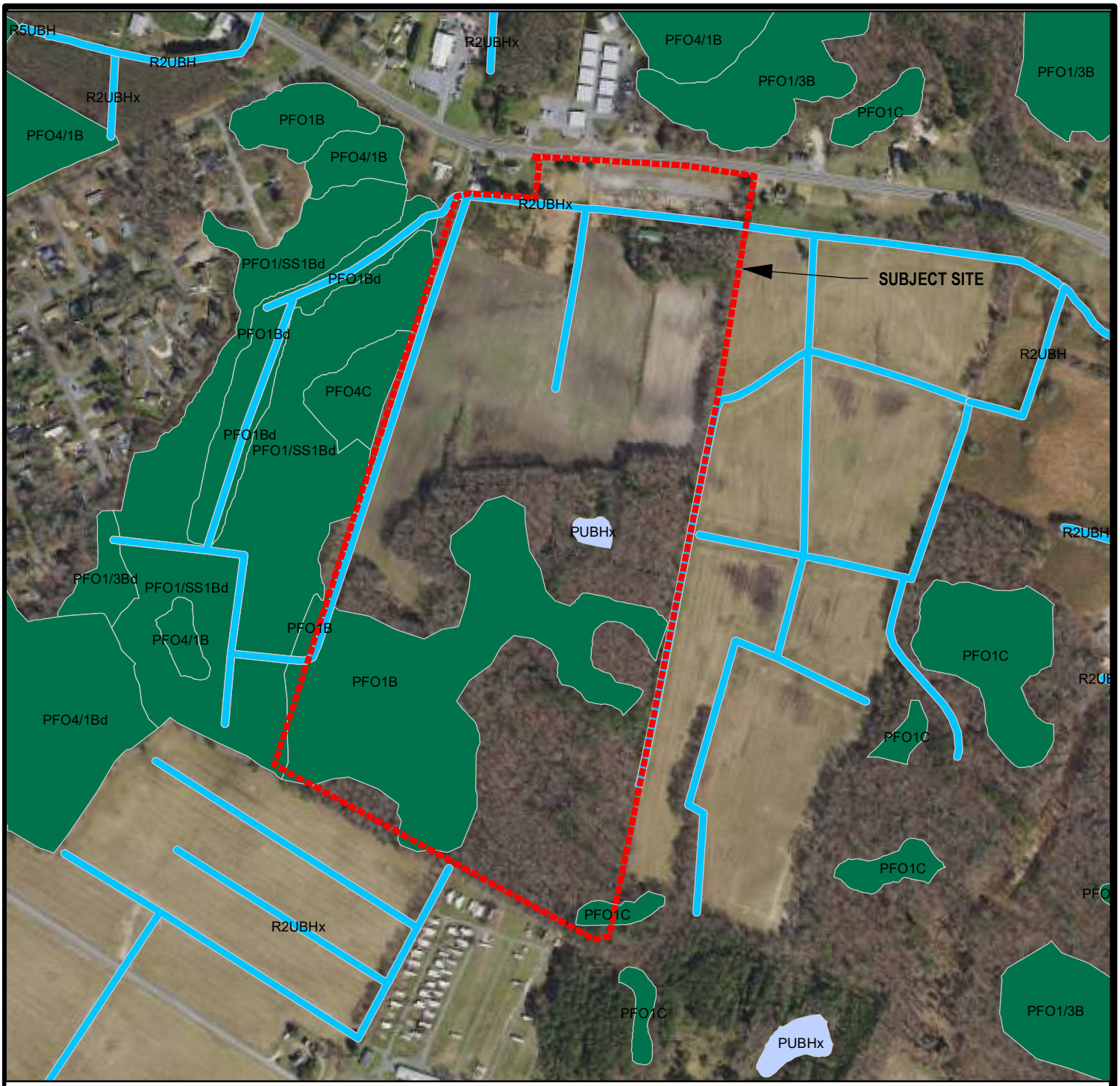
SOIL SURVEY MAP

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	31190731	SCALE:	1" = 500	DATE:	JUNE 13, 2019	DRAWN BY:	TAB	REVIEW BY:	TAS	FIGURE:	3

L:\Shared\Project Files\2019\31190731 - Twin Cedars\WET\CAD\GIS\31190731_SOIL.mxd



SOURCE: UNITED STATES FISH AND WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY.
2017 BASE AERIAL IMAGERY PROVIDED BY THE NATIONAL AGRICULTURAL IMAGERY PROGRAM.

LEGEND

- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND
- RIVERINE

NORTH

0 500

APPROXIMATE SCALE
1 INCH = 500 FEET

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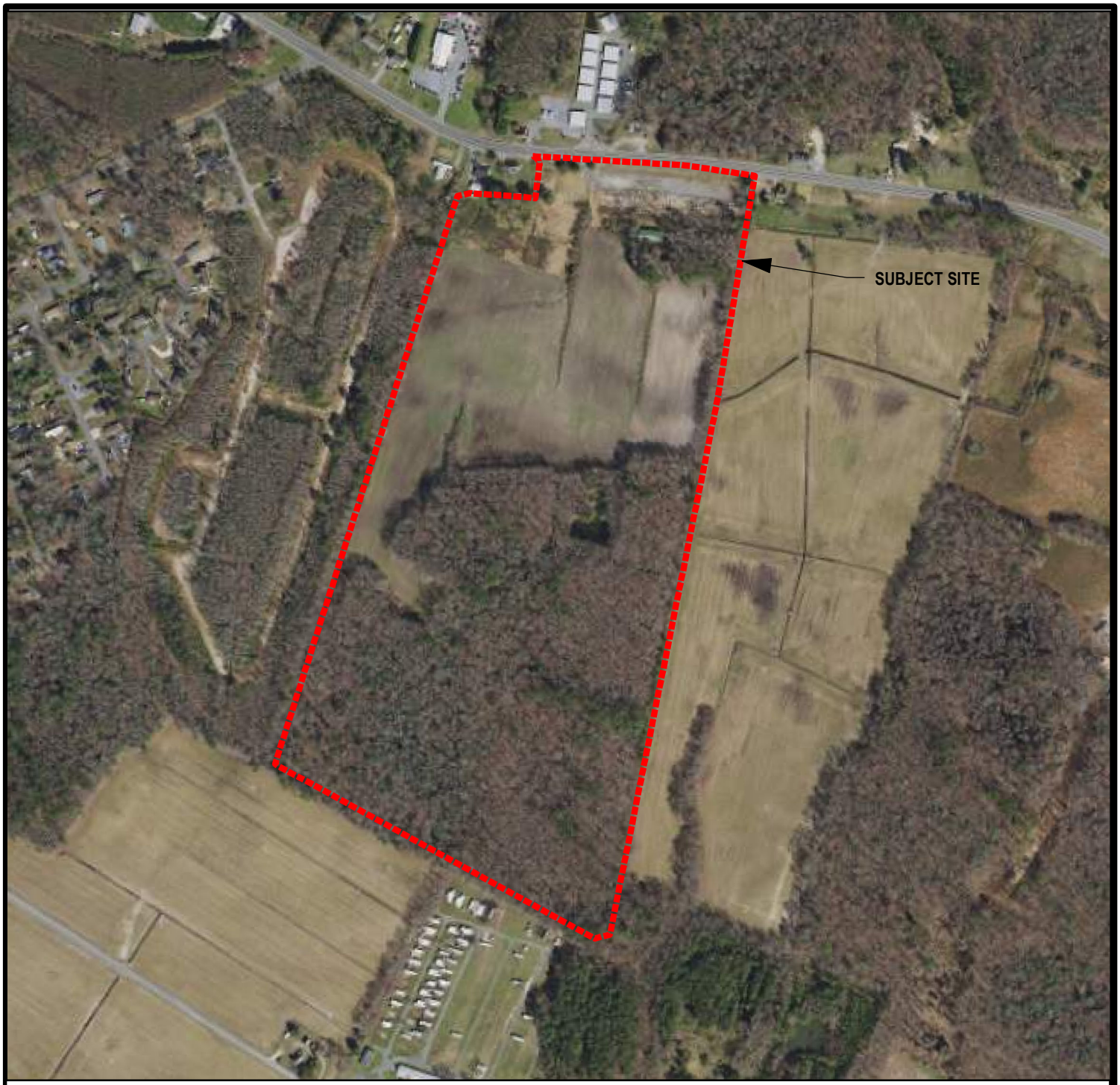
NWI WETLANDS MAP

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
31190731	1" = 500	JUNE 13, 2019	TAB	TAS	4

L:\Shared\Project Files\2019\31190731 - Twin Cedars\WET\CAD\GIS\31190731_NWI.mxd



SOURCE: 2017 BASE AERIAL IMAGERY PROVIDED BY THE NATIONAL AGRICULTURAL IMAGERY PROGRAM.

NORTH

0 500

APPROXIMATE SCALE
1 INCH = 500 FEET

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2017 AERIAL IMAGERY

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	31190731	SCALE:	1" = 500	DATE:	JUNE 13, 2019	DRAWN BY:	TAB	REVIEW BY:	TAS	FIGURE:	5

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Appendix B:

Data Forms

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-1
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.47773 Long: -75.15158 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: N/A
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____		
Hydric Soil Present?	Yes ____ No X	Is the Sampled Area within a Wetland?	Yes ____ No X
Wetland Hydrology Present?	Yes ____ No X		

Remarks: This DCP was established within a wooded area east of Wetland 1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____	
Water Table Present?	Yes ____	No X	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-1

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	Y	FAC
2. *Liquidambar styraciflua*	40	Y	FAC
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		
50% of total cover: 50		20% of total cover:	20
Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Clethra alnifolia*	15	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	15 = Total Cover		
50% of total cover: 7.5		20% of total cover:	3
Herb Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	5	Y	FAC
2. *Smilax glauca*	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10 = Total Cover		
50% of total cover: 5		20% of total cover:	2
Woody Vine Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5		20% of total cover:	1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL

Sampling Point: DCP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 2/1	100					L	
13-20	10YR 3/1	95	10YR 3/6	5	C	M	CL	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-2
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.47776 Long: -75.15174 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: PFO
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks: This DCP was established within Wetland 1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____		
Water Table Present?	Yes ____	No X	Depth (inches): ____		
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	Wetland Hydrology Present?	Yes X No ____

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-2

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	50	Y	FAC
2. *Acer rubrum*	50	Y	FAC
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		
50% of total cover: 50		20% of total cover: 20	
Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Liquidambar styraciflua*	10	Y	FAC
2. *Acer rubrum*	10	Y	FAC
3. *Ilex opaca*	5	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	25 = Total Cover		
50% of total cover: 12.5		20% of total cover: 5	
Herb Stratum (Plot size: 30' Radius)			
1. *Cinna arundinacea*	60	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		
50% of total cover: 30		20% of total cover: 12	
Woody Vine Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5		20% of total cover: 1	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL Sampling Point: DCP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					SaL	
3-15	10YR 4/2	90	10YR 5/8	10	C	M	SaL	
15-20	10YR 2/1	100					SaL	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** **X** **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-3
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope (%): 0±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.47699 Long: -75.15161 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: PFO
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks: This DCP was established within Wetland 2.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____		
Water Table Present?	Yes ____	No X	Depth (inches): ____		
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	Wetland Hydrology Present?	Yes X No ____

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-3

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	45	Y	FAC
2. *Acer rubrum*	40	Y	FAC
3.			
4.			
5.			
6.			
7.			
	85 = Total Cover		
50% of total cover: 42.5		20% of total cover: 17	
Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Ilex opaca*	10	Y	FAC
2. *Clethra alnifolia*	10	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10		20% of total cover: 4	
Herb Stratum (Plot size: 30' Radius)			
1. *Woodwardia areolata*	60	Y	OBL
2. *Cinna arundinacea*	10	N	FACW
3. *Toxicodendron radicans*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75 = Total Cover		
50% of total cover: 37.5		20% of total cover: 15	
Woody Vine Stratum (Plot size: 30' Radius)			
1. Stratum Not Present			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL Sampling Point: DCP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	5Y 2.5/1	100					LSa	
15-20	10YR 4/3	100					LSa	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
X Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-4
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.427724 Long: -75.15142 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: N/A
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____		
Hydric Soil Present?	Yes ____ No X	Is the Sampled Area within a Wetland?	Yes ____ No X
Wetland Hydrology Present?	Yes ____ No X		

Remarks: This DCP was established between Wetland 2 and Waters A.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____	
Water Table Present?	Yes ____	No X	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-4

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	Y	FAC
2. *Liquidambar styraciflua*	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
	90 = Total Cover		
50% of total cover: 45		20% of total cover: 18	
Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Clethra alnifolia*	50	Y	FACW
2. *Ilex opaca*	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	60 = Total Cover		
50% of total cover: 30		20% of total cover: 12	
Herb Stratum (Plot size: 30' Radius)			
1. *Woodwardia areolata*	75	Y	OBL
2. *Clethra alnifolia*	10	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
50% of total cover: 42.5		20% of total cover: 17	
Woody Vine Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5		20% of total cover: 1	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL

Sampling Point: DCP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 2/1	100					SaL	
15-20	10YR 3/2	100					SaL	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-5
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope (%): 0±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.47791 Long: -75.15276 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: PFO
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____		
Hydric Soil Present?	Yes X No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Wetland Hydrology Present?	Yes X No ____		

Remarks: This DCP was established within Wetland 3.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____		
Water Table Present?	Yes ____	No X	Depth (inches): ____		
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	Wetland Hydrology Present?	Yes X No ____

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-5

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	Y	FAC
2. *Liquidambar styraciflua*	40	Y	FAC
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		
50% of total cover: 50		20% of total cover:	20
Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Liquidambar styraciflua*	10	Y	FAC
2. *Clethra alnifolia*	10	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10		20% of total cover:	4
Herb Stratum (Plot size: 30' Radius)			
1. *Woodwardia areolata*	80	Y	OBL
2. *Liquidambar styraciflua*	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45		20% of total cover:	18
Woody Vine Stratum (Plot size: 30' Radius)			
1. Stratum Not Present			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL

Sampling Point: DCP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					LSa	
14-20	10YR 5/2	100					LSa	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
X Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-6
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.47807 Long: -75.15254 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: N/A
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Hydrology Present?	Yes		No	X	

Remarks: This DCP was established within a wooded area north of Wetland 3.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-6

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	Y	FAC
2. *Liquidambar styraciflua*	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
	90 = Total Cover		
50% of total cover: 45		20% of total cover: 18	
Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Liquidambar styraciflua*	25	Y	FAC
2. *Ilex opaca*	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40 = Total Cover		
50% of total cover: 20		20% of total cover: 8	
Herb Stratum (Plot size: 30' Radius)			
1. *Osmunda regalis*	5	Y	OBL
2. *Liquidambar styraciflua*	5	Y	FAC
3. *Toxicodendron radicans*	5	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15 = Total Cover		
50% of total cover: 7.5		20% of total cover: 3	
Woody Vine Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5		20% of total cover: 1	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL Sampling Point: DCP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/1	100					SaL	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM-Atlantic and Gulf Coastal Plain Region

Project/Site: Twin Cedars City/County: Sussex Sampling Date: 17-Jun-19
Applicant/Owner: Bay Developers, LLC State: DE Sampling Point: DCP-7
Investigator(s): M. Jennette, R. McGehee Section, Township, Range: N/A
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0±
Subregion (LLR or MLRA): MLRA 153D Lat: 38.48033 Long: -75.15110 Datum: NAD83
Soil Map Unit Name: Mullica-Berryland Complex, 0-2% slopes (MuA) NWI classification: PFO
Are climatic/hydrologic conditions on the site are typical for this time of year? Yes X No ____ (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks: This DCP was established within Wetland 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15) (LRR U)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)
- ____ Sphagnum moss (D*) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches):	1"	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: DCP-7

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	50	Y	FAC
2. *Acer rubrum*	40	Y	FAC
3. *Pinus taeda*	5	N	FAC
4.			
5.			
6.			
7.			
	95 = Total Cover		
50% of total cover: 47.5		20% of total cover: 19	

Sapling / Shrub Stratum (Plot size: 30' Radius)			
1. *Acer rubrum*	20	Y	FAC
2. *Liquidambar styraciflua*	20	Y	FAC
3. *Platanus occidentalis*	5	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
	45 = Total Cover		
50% of total cover: 22.5		20% of total cover: 9	

Herb Stratum (Plot size: 30' Radius)			
1. *Parthenocissus quinquefolia*	10	Y	FACU
2. *Campsis radicans*	10	Y	FAC
3. *Boehmeria cylindrica*	10	Y	FACW
4. *Toxicodendron radicans*	5	N	FAC
5. *Cinna arundinacea*	5	N	FACW
6. *Woodwardia areolata*	5	N	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	45 = Total Cover		
50% of total cover: 22.5		20% of total cover: 9	

Woody Vine Stratum (Plot size: 30' Radius)			
1. *Campsis radicans*	5	Y	FAC
2. *Smilax rotundifolia*	5	Y	FAC
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5		20% of total cover: 2	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 89% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X - 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling/Shrub - Woody plants, excluding woody vines, a less than 3in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall

Woody vine - All woody vines, greater than 3.28 ft. in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet).

SOIL

Sampling Point: DCP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					SaL	
14-20	10YR 5/1	100					LSa	

[1]Type: C=concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
X Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
X Dark Surface (S7) **(LRR P, S, T, U)**

___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** **X** **No** ___

Remarks:

Appendix C:

Photographs

Photograph 1: View of Wetland 1, facing north.

Photograph 2: View of ponded portion of Wetland 1, facing west.

Photograph 3: View of Wetland 2, facing west.

Photograph 4: View of Wetland 3, facing west.

Photograph 5: View of Wetland 4, facing north.

Photograph 6: View of Waters A, facing east and upstream.

Photograph 7: View of Waters B, facing south and upstream.

Photograph 8: View of Waters C, facing east and downstream.

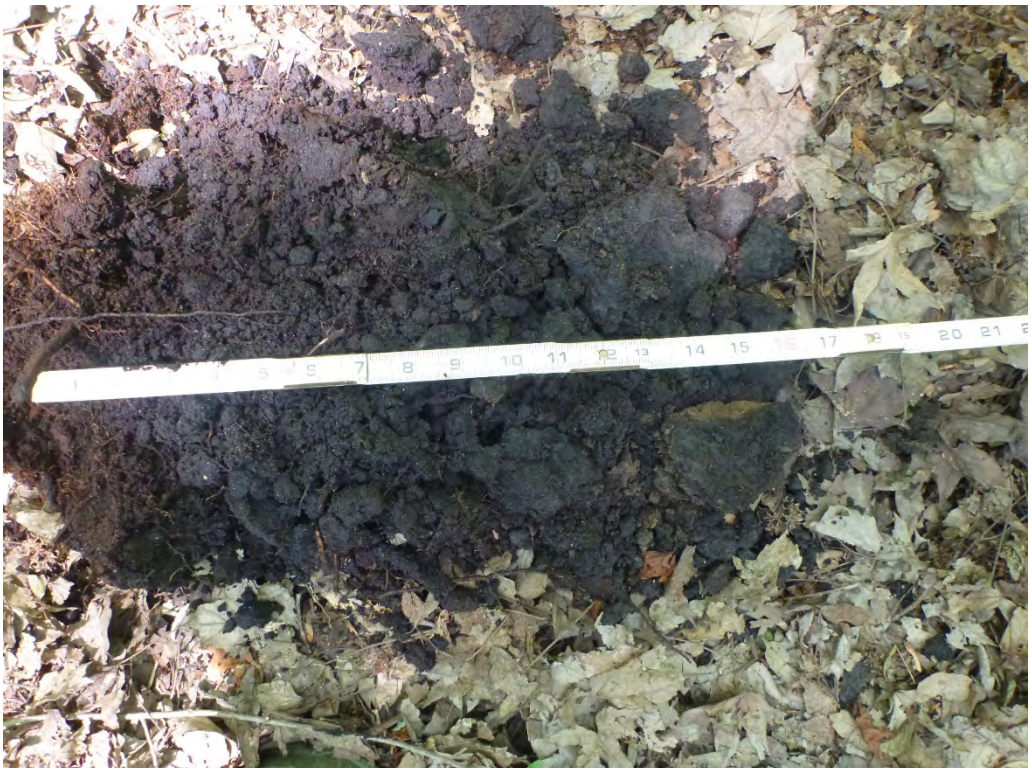
Photograph 9: DCP-1, sample location.

Photograph 10: DCP-1, soil sample.

Photograph 11: DCP-2, sample location.

Photograph 12: DCP-2, soil sample.

Photograph 13: DCP-3, sample location.



Photograph 14: DCP-3, soil sample.

Photograph 15: DCP-4, sample location.

Photograph 16: DCP-4, soil sample.

Photograph 17: DCP-5, sample location.

Photograph 18: DCP-5, soil sample.

Photograph 19: DCP-6, sample location.

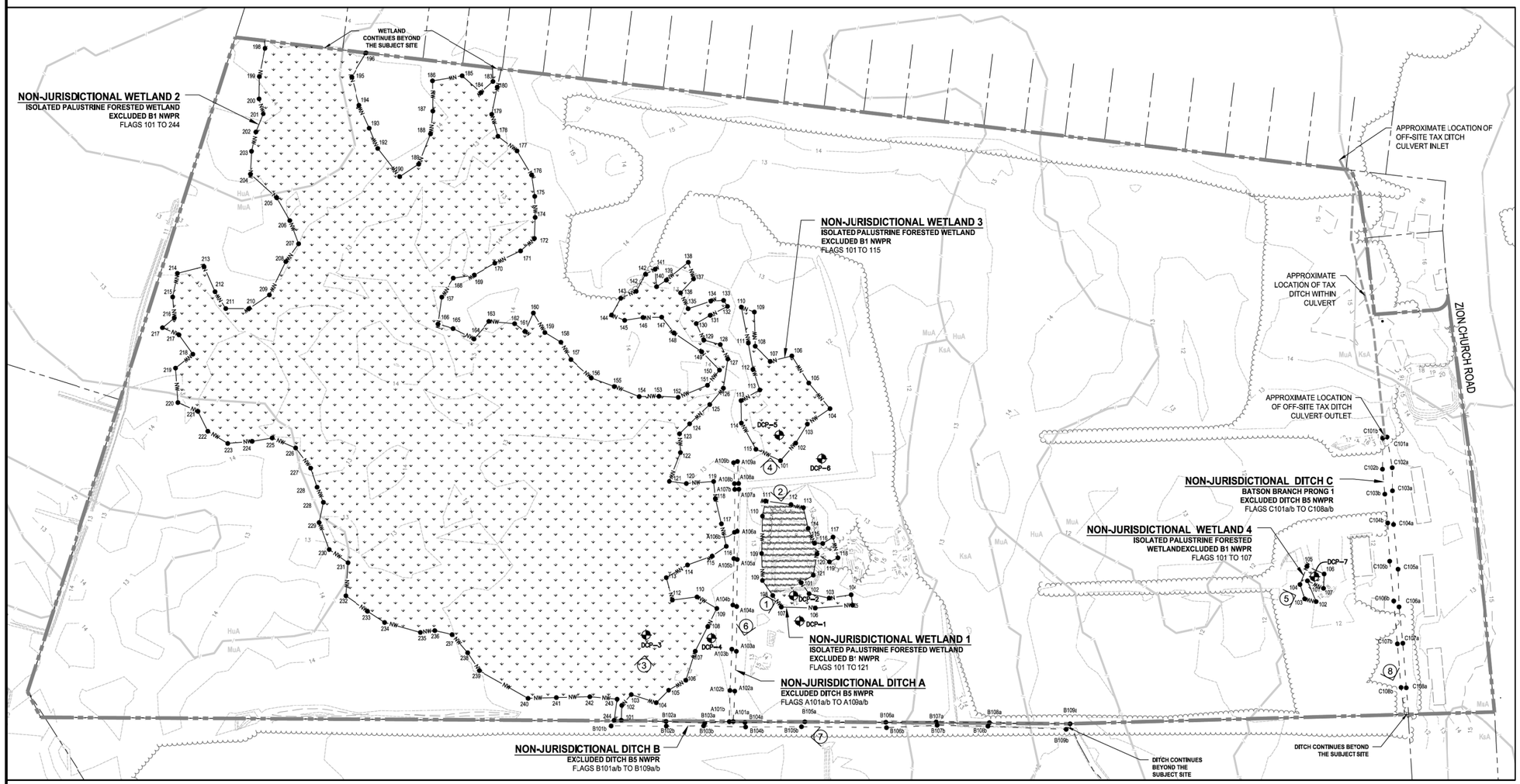
Photograph 20: DCP-6, soil sample.

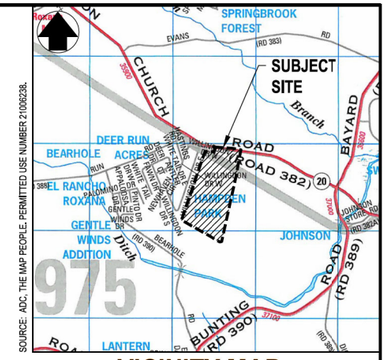
Photograph 21: DCP-7, sample location.

Photograph 22: DCP-7, soil sample.

Appendix D:

Wetland Delineation Plan





VICINITY MAP

SCALE: 1"=2000'

GENERAL INFORMATION

1. PROJECT LOCATION: SOUTH OF ZION CHURCH ROAD IN THE SELBYVILLE AREA OF SUSSEX COUNTY, DELAWARE.
2. PLAN PREPARED FOR: BAY DEVELOPERS, LLC.
   680 FOREST STREET
   DOVER, DELAWARE 19904
   ATTN: MR. HENRY MAST
3. PLAN PREPARED BY: GEO-TECHNOLOGY ASSOCIATES, INC. (GTA)
   3445-A BOX HILL CORPORATE CENTER DRIVE
   ABINGDON, MARYLAND 21009
   ATTN: MR. MATTHEW JENNETTE
4. AREA OF SUBJECT SITE: APPROXIMATELY 64.34 ACRES
5. THE SUBJECT SITE IS IDENTIFIED AS SUSSEX COUNTY TAX PARCEL 5-33-11.00-42.00.
6. ACCORDING TO FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FEDERAL INSURANCE RATE MAP (FIRM) NUMBER 10005C0635K, EFFECTIVE MARCH 16, 2015, THE SUBJECT SITE IS NOT LOCATED WITHIN A 100-YEAR FLOODPLAIN.
7. ACCORDING TO THE *DELAWARE TAX DITCH MAP* PROVIDED BY THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, DELAWARE DRAINAGE PROGRAM (ACCESSED MAY 21, 2019), PORTIONS OF THE APPARENT TAX DITCH ON THE SUBJECT SITE IS LOCATED WITHIN A CULVERT SOUTH OF ZION CHURCH ROAD. THIS TAX DITCH IS IDENTIFIED AS BATSON BRANCH PRONG 1 AND THE LOCATION OF THIS CULVERT WAS APPROXIMATED BASED ON THE *DELAWARE TAX DITCH MAP*.
8. A WETLAND DELINEATION OF THE SUBJECT SITE WAS PERFORMED BY GTA IN JUNE 2019. WETLAND FLAG LOCATIONS WITHIN THE SUBJECT SITE WERE SURVEY LOCATED BY MORRIS & RITCHIE ASSOCIATES, INC. (MRA) IN SEPTEMBER 2019.
9. AS A RESULT OF THE REVIEW OF THE SITE, IT IS GTA'S PROFESSIONAL OPINION THAT THERE ARE NO JURISDICTIONAL "WATERS OF THE U.S." PRESENT WITHIN THE SUBJECT SITE.
10. GTA'S CONCLUSIONS REGARDING THIS SITE HAVE BEEN BASED ON OBSERVATIONS OF EXISTING CONDITIONS, PROFESSIONAL EXPERIENCE, AND GENERALLY ACCEPTED PROFESSIONAL ENVIRONMENTAL PRACTICE UNDER SIMILAR CIRCUMSTANCES. SEASONAL VEGETATION CYCLES AND FLUCTUATIONS IN PRECIPITATION OR WEATHER CONDITIONS CAN RESULT IN DIFFERENCES IN THE PERCEPTION OF HYDROLOGIC CONDITIONS AND THE PRESENCE OF PREDOMINANTLY HYDROPHYTIC VEGETATION, WHICH CAN ALTER GTA'S EVALUATION OF WETLANDS/WATERWAYS.
11. IT IS IMPORTANT TO NOTE THAT THIS EVALUATION IS GTA'S PROFESSIONAL OPINION, ONLY. DECISIONS REGARDING THE OFFICIAL JURISDICTIONAL STATUS OF WETLANDS/WATERWAYS ARE MADE BY FEDERAL, STATE, AND/OR LOCAL REGULATORY AGENCIES.
12. THIS PLAN WAS PREPARED BY GTA FOR THE SOLE AND EXCLUSIVE USE OF BAY DEVELOPERS, LLC. ANY REPRODUCTION OF THIS PLAN BY ANY OTHER PERSON WITHOUT THE EXPRESSED WRITTEN PERMISSION OF GTA AND BAY DEVELOPERS, LLC. IS UNAUTHORIZED, AND SUCH USE IS AT SOLE RISK OF THE USER.

LEGEND

- SUBJECT SITE
- EXISTING PROPERTY BOUNDARY
- APPROXIMATE TREELINE
- EXISTING 1' CONTOUR
- APPROXIMATE SOIL BOUNDARY
- EX. NONTIDAL WETLAND (WITH NUMBERED FLAG LOCATIONS)
- AREA OF OPEN WATER
- EX. DITCH (WITH NUMBERED FLAG LOCATIONS)
- DCP-5 WETLAND DELINEATION DATA COLLECTION POINT (DCP)
- 1 NUMBERED PHOTOGRAPH LOCATION

SOILS CHART

SYMBOL[1]	NAME/DESCRIPTION[1]	HYDRIC SOIL[2]	HYDRIC COMPONENT[2]	PERCENTAGE OF MAPPING UNIT[2]	POSITION IN LANDSCAPE[2]
HuA	HURLOCK LOAMY SAND, 0-2% SLOPES	YES	HURLOCK, UNDRAINED	40	DEPRESSIONS, FLATS, SWALES
			HURLOCK, DRAINED	40	FLATS, SWALES, DEPRESSIONS
KsA	KLEJ LOAMY SAND, 0-2% SLOPES	YES	BERRYLAND, DRAINED	5	FLATS, DEPRESSIONS, SWALES
			HURLOCK, DRAINED	5	SWALES, FLATS, DEPRESSIONS
MuA	MULLICA-BERRYLAND COMPLEX, 0-2% SLOPES	YES	BERRYLAND, DRAINED	25	DEPRESSIONS, FLATS, SWALES
			MULLICA, DRAINED	25	FLATS, SWALES, DEPRESSIONS
			MULLICA, UNDRAINED	15	FLATS, DRAINAGEWAYS, , SWALES, DEPRESSIONS
			BERRYLAND, UNDRAINED	15	DEPRESSIONS, FLATS, DRAINAGEWAYS, SWALES,
			ASKECKSY, DRAINED	5	DEPRESSIONS, SWALES, FLATS

1. U. S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE'S WEB SOIL SURVEY, ON JUNE 13, 2019, AT <HTTP://WWW.MD.NRCS.USDA.GOV/TECHNICAL/SOILS.HTML>
2. HYDRIC SOILS INFORMATION AVAILABLE FROM THE STATE SOIL DATA ACCESS HYDRIC SOILS LIST, AT <HTTPS://WWW.NRCS.USDA.GOV/INTERNET/FSE_DOCUMENTS/NRCSEPRD1315619.HTM#REPORTREP>, ACCESSED JUNE 13, 2019.

AREA OF WETLANDS/WATERWAYS WITHIN SUBJECT SITE

WETLAND	AREA
WETLAND 1	18,817 SF (0.43 AC)
WETLAND 2	676,330 SF (15.53 AC)
WETLAND 3	20,938 SF (0.48 AC)
WETLAND 4	1,586 SF (0.04 AC)
TOTAL WETLAND AREA	717,671 SF (16.47 AC)

WATERWAY	AREA	LENGTH
DITCH A	3,513 SF (0.08 AC)	480 LINEAR FEET
DITCH B	284 SF (0.007 AC)	841 LINEAR FEET
DITCH C	5,899 SF (0.13 AC)	1,022 LINEAR FEET
TOTAL WATERWAYS	9,696 SF (0.22 AC)	2,343 LINEAR FEET

NORTH

0' 25' 50' 100' 200'

SCALE: 1"=100'

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

WETLAND DELINEATION PLAN

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

DATE	REVISIONS

JOB NO:	31190731
SCALE:	1" = 100'
DATE:	MARCH 31, 2021
DRAWN BY:	MDP
DESIGN BY:	MAJ
REVIEW BY:	TAS
SHEET:	1 OF 1

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Appendix 8 – Phase I Environmental Site Assessment

Geo-Technology Associates, Inc. – July 11, 2019

REPORT OF
PHASE I ENVIRONMENTAL SITE ASSESSMENT

TWIN CEDARS

Sussex County, Delaware

July 11, 2019

Prepared for:

BAY DEVELOPERS, LLC
680 Forest Street
Dover, Delaware 19904

Attn: Mr. Henry Mast

Prepared by:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
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GTA Project No: 31190731

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

July 11, 2019

Bay Developers, LLC
680 Forest Street
Dover, Delaware 19904

Attn: Mr. Henry Mast

Re: Phase I Environmental Site Assessment
Twin Cedars
Sussex County, Delaware

Dear Mr. Mast:

In accordance with our agreement dated March 8, 2019, Geo-Technology Associates, Inc. (GTA) has performed a Phase I Environmental Site Assessment (ESA) of the above referenced property. The subject property comprises approximately 64.34 of land located along the south side of Zion Church Road in the Selbyville area of Sussex County, Delaware. The subject property is identified as Parcel 5-33-11.00-42.00. The subject property currently contains an apparent wastewater treatment structure, open fields, and undeveloped woods. GTA understands that the subject property is planned to be developed with 86 single-family units and 168 apartment units serviced by public water and sewer utilities.

We appreciate the opportunity to be of assistance on this project. Should you have any questions regarding this information, or should you require additional information, please contact the undersigned at your convenience.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.

Samuel A. Geer
Environmental Scientist

Mark D. Rodano
Vice President

SAG/MDR/cds
31190731
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EXECUTIVE SUMMARY

Geo-Technology Associates, Inc. (GTA) has performed a Phase I Environmental Site Assessment (ESA) of Twin Cedars (the "subject property", "site"). This ESA was performed in general accordance with ASTM International (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (E1527-13).*

This *Executive Summary* is limited in scope and detail and is presented for the convenience of the reader. Do not rely on this *Executive Summary* for any purpose except that for which it was prepared. Please refer to the full report for details concerning the environmental condition of the subject property, as well as the scope and limitations of this ESA. Rely only on the full report for information about the findings, recommendations, and other concerns.

The subject property comprises approximately 64.34 of land located along the south side of Zion Church Road in the Selbyville area of Sussex County, Delaware. The subject property is identified as Parcel 5-33-11.00-42.00. The subject property currently contains an apparent wastewater treatment structure, open fields, and undeveloped woods. Historically, the majority of the subject property has consisted of open fields and undeveloped woods similar to current conditions. In addition, several apparent structures were present on the northern portion of the subject property, along Zion Church Road, as early as 1938. These structures were no longer present by 1981. By 1992, three additional structures were constructed on the northern portion of the site. A fourth structure was added in 2005. Three of the four structures were razed by 2017. GTA personnel did not observe obvious indications of above-ground storage tanks (ASTs), underground storage tanks (USTs), groundwater monitoring wells, or similar environmental concerns in association with the subject property. The subject property was identified as the site of a groundwater discharge permit for a previous large wastewater system and a basic wetlands application.

The surrounding vicinity currently contains open land, undeveloped woods, and scattered residential developments. Historically, the surrounding vicinity contained open land, undeveloped woods, farms, and scattered residential development. The Hitchens Pit, a construction debris dumping site is located approximately 0.10-mile southeast of the subject property. According to correspondence with the Delaware Department of Natural Resources and Environmental Control (DNREC), the site has been administratively closed since 2017. Additionally, DNREC records indicate that a 1989 investigation of the site determined that no hazardous substances were present and that "no further action was recommended." A Federal and State environmental regulatory database report identified the former Hitchens Pit and an additional site of environmental concern or regulation in the surrounding vicinity. Based on their locations relative to the subject property and/or their regulatory statuses, the identified regulatory sites are unlikely to have adversely impacted the environmental quality of the subject property.

This Phase I ESA has revealed no evidence of recognized environmental conditions (RECs) in connection with the subject property.

TABLE OF CONTENTS

LIST OF APPENDICES

PHASE I ENVIRONMENTAL SITE ASSESSMENT

TWIN CEDARS
SUSSEX COUNTY, DELAWARE
JULY 11, 2019

1.0 INTRODUCTION

1.1 Purpose

At the request of Bay Developers, LLC (Client), Geo-Technology Associates, Inc. (GTA) performed the following Phase I Environmental Site Assessment (ESA) to identify recognized environmental conditions (RECs) that may be associated with the subject property, which is described in *Section 2.0* of this Report. The ASTM International (ASTM) has defined a REC and related terms as follows:

- Recognized Environmental Condition (REC): "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions."

- Historical REC (HREC): "a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls."

- Controlled REC (CREC): "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls."

- De Minimis: "a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis conditions are not recognized environmental conditions nor controlled recognized environmental conditions."

This Report was prepared by GTA for the sole and exclusive use of Bay Developers, LLC. Use and reproduction of this Report by any other person without the express written permission of GTA and Bay Developers, LLC is unauthorized, and such use is at the sole risk of the user.

1.2 Scope of Services

This ESA was performed and this Report was prepared in general accordance with applicable standards and with a review of reasonably ascertainable data, as set forth in the ASTM *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (E1527-13)*. The scope of services for this Phase I ESA generally included the following:

- Records Review – Review of reasonably ascertainable current and historical records for the subject property and site vicinity, including, but not limited to, a regulatory database report summarizing Federal and State environmental agency records; aerial photography; street directories; *Sanborn® Fire Insurance Maps*; property tax files; chain of title information for the subject property (if provided by the Client or property owner); physical setting documentation; and previous environmental reports.

- Site Reconnaissance – Non-intrusive visual observations of the subject property for indications of hazardous substances, petroleum products, above-ground storage tanks (ASTs), underground storage tanks (USTs), groundwater monitoring wells, polychlorinated biphenyl (PCB)-containing equipment, stained soil, stressed vegetation, pits, ponds, lagoons, structures, utilities, access roads, and similar features of potential environmental concern.

- Interviews – Interviews (in person, via telephone, or via written request) with, but not limited to, relevant regulatory authorities and present and past property owners, operators, or occupants, where relevant.

- Report – Preparation of a Phase I ESA Report summarizing the information collected.

Considerations that were not reviewed as part of this ESA, and that are considered non-scope issues by ASTM and/or otherwise beyond the scope of this assessment, include, but are not limited to, asbestos-containing materials (ACMs), radon, lead-based paint (LBP), lead in drinking water, wetlands, regulatory compliance, cultural and historic resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, biological agents, mold, water potability issues (e.g., nitrates, pH, turbidity, coliforms, etc.),

other substances under naturally occurring conditions (e.g., metals such as arsenic), methane, miscellaneous building components (e.g., mercury-containing switches or bulbs, PCB-containing light ballasts), and high voltage power lines.

1.3 Limitations

GTA's conclusions regarding this site have been based on observations of existing conditions at the time of the site reconnaissance and an interpretation of site history and site usage data. Therefore, conclusions reached regarding the conditions of this site do not represent a warranty that all areas within the site are of a similar quality as may be inferred from observable site conditions and available site history. Please be advised that as stated in the ASTM Standard, no environmental site assessment can wholly eliminate uncertainty regarding the potential for environmental liability in connection with the property. GTA's evaluation and analysis are intended to reduce, but not eliminate, the potential for conditions that result in liability for the Client.

Please be advised that ASTM indicates that a Phase I ESA completed less than 180 days prior to the date of the property transaction is presumed to be valid. To satisfy the ASTM Standard, ESAs completed more than 180 days prior to the date of the property transaction are required to be updated.

The following limitations should be noted with respect to this Phase I ESA. These limitations are not necessarily exceptions to the ASTM Standard.

- No chain of title documentation has been provided to GTA.
- The earliest available historical use information consisted of a 1901 United States Geological Survey (USGS) Map.
- Portions of the subject property were densely vegetated, and the apparent wastewater system structure was locked, limiting GTA's site observations.
- The subject property boundaries were not marked at the time of GTA's site visit. GTA estimated the property boundaries using existing site features, the tax map information described in *Section 2.1*, aerial photographs, and/or site plans, if available.
- GTA provided the Client with a "User" questionnaire regarding the Client's knowledge of environmental concerns associated with the subject property, and a response is pending at this time. If such information is received at a later date and materially alters the findings of this ESA, GTA will submit an addendum to the Client.

- The previous owner of the subject property is deceased. GTA personnel contacted the previous owner's next of kin, who was not familiar with the historic uses of the site.

1.4 Significant Assumptions

As part of this ESA, GTA has obtained data from various sources (e.g., historical documents, regulatory information, site drawings, interviews with individuals familiar with the site and regulatory representatives). GTA relies on this information in forming a professional opinion and assumes that the information is accurate and correct. GTA shall not be responsible for conditions or consequences arising from incorrect data sources or relevant facts that were concealed, withheld or not fully disclosed at the time this Report was prepared. Unless otherwise noted, GTA assumes that the user has requested this Phase I ESA to qualify for a "landowner liability protection" (LLP) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.5 Data Gaps

ASTM defines a "data gap" as a lack of or inability to obtain information required by the Phase I ESA standard despite good faith efforts by the Environmental Professional to gather such information. Data gaps may result from incompleteness in any of the activities required by the Phase I ESA, including, but not limited to, the site reconnaissance and interviews. Common data gaps include the inaccessibility of structures and inability to interview key site managers. Significant data gaps are those that affect the ability of the Environmental Professional to identify RECs. Significant data gaps were not identified as part of this ESA.

1.6 Qualifications

I, Mark D. Rodano, declare that, to the best of my professional knowledge and belief, I meet the definition of an *Environmental Professional* as defined in Part 312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the "All Appropriate Inquiries" in general conformance with the standards and practices set forth in 40 CFR Part 312. The qualifications of the Environmental Professionals who performed this Phase I ESA are available to the Client upon request.

2.0 PHYSICAL SETTING

2.1 Site Location

The subject property comprises approximately 64.34 of land located along the south side of Zion Church Road in the Selbyville area of Sussex County, Delaware. The subject property is identified as Parcel 5-33-11.00-42.00. The subject property currently contains an apparent wastewater treatment structure, open fields, and undeveloped woods. A *Site Location Map* for the subject property is presented as *Figure 1 (Appendix A)*.

According to the records of the Sussex County Property Records Search (SCPRS), the subject property encompasses approximately 64.22 acres, and is identified as Parcel Identification Number 533-11.00-42.00. The SCPRS indicates that the subject parcel is currently owned by Twin Cedars LLC and was acquired from Clark/Howe LLC in 2006. Previous owners of the site include Twin Cedars Apartments LLC, Williams A. Mills, Brasford Service Corp, Millkoenig Grewell Partnership, and David and Betty Long. The SCPRS identifies the subject parcel at 36108 Zion Church Road, with no structures listed. The SCPRS indicates that the land use for the subject parcel is agricultural.

GTA was provided with a copy of *Existing Conditions* (Plan) of Twin Cedars, prepared by Morris & Ritchie Associates, Inc. (MRA), and dated April 2019. The MRA Plan indicates that the subject property encompasses approximately 64.34 acres of land. No structures are depicted on the subject property, and scattered homes are depicted in the site vicinity. The MRA Plan indicates that the subject property is proposed to be developed with 168 apartment units and 86 single-family units. The residential lots will be accessed by a road, which will extend south from Zion Church Road, or by several additional interior roads that will extend from the main ingress-egress road. In addition, the MRA Plan indicates that four stormwater management (SWM) facilities are proposed to be constructed on the northern, eastern, and southeastern portions of the site.

2.2 Topography

The topographic information on the USGS Topographic Quadrangle Map for the site vicinity indicates that the ground surface elevations on the site range from approximately 15 feet above Mean Sea Level (ft MSL) on the southern portion of the subject property, to approximately 10 ft MSL on the northern portion of the subject property. The subject property is depicted sloping downward to the northeast, toward easterly flowing tributaries of the Dirickson Creek that are located approximately 0.25-mile east of the site. Apparent drainage channels are depicted crossing the northern portion of the site. Surficial drainage is collected by these drainage areas and is directed toward the east, subsequently discharging into Dirickson Creek, which is located approximately 0.50-mile east of the site. The topographic information depicted on the MRA Plan is generally consistent with that shown on the USGS Map. A *Topographic Map* for the site and vicinity, based on the USGS Map, is included as *Figure 2*.

2.3 Soils

According to the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Web Soil Survey (reviewed on June 7, 2019), the site is underlain by Askecksy loamy sand (AsA), Hammonton loamy sand (HmA), Hurlock loamy sand (HuA), Klej loamy sand (KsA), Mullica-Berryland complex (MuA), Pepperbox loamy sands (PpA and PpB).

2.4 Geology and Hydrogeology

According to the *Geologic Map of the Frankford and Selbyville Quadrangles, Delaware* (2013), the site vicinity is situated in the Coastal Plain Physiographic Province. Specifically, the site is underlain by the Omar Formation which is characterized by light-gray to gray, silty clay to silty, very fine sand with scattered shell beds and a coarse basal sand.

Hydrologically, the Coastal Plain is underlain by both unconfined and confined aquifers of unconsolidated sediments, which overlie consolidated bedrock and dip toward the southeast. Groundwater storage and movement are functions of the primary porosity of the sediments. Larger storage is provided by gravel and sand, with little to no storage provided by clay. Near-surface, unconfined aquifers typically consist of sediments of higher permeability and are

recharged locally, primarily through precipitation that permeates through the unsaturated zone into the aquifer. The water table in unconfined aquifers is therefore highly variable, fluctuating with the seasons and with rates of precipitation. Variations in the groundwater surface and flow generally reflect the topography and relative locations of surface water features. Intermittent confining layers can locally alter the water table conditions. The deeper, confined aquifers are bound by confining layers above and below, creating an artesian system. Confined aquifers are recharged in areas where the formation crops out, generally in more remote areas to the west.

The groundwater flow direction in the site vicinity is assumed to mirror surficial topography. Accordingly, the groundwater flow direction is assumed to be generally toward the northeast in the immediate site vicinity.

3.0 SITE AND VICINITY DESCRIPTION

3.1 Site Conditions

GTA personnel performed a site reconnaissance on June 25, 2019. GTA personnel were unaccompanied at the time. The weather was sunny with temperatures in the mid-80's. Portions of the subject property were densely vegetated, and the apparent wastewater treatment structure was locked, limiting GTA's site observations. A *Site Sketch* is included as *Figure 3*. Photographs taken during GTA's site reconnaissance are presented as *Appendix B*.

3.1.1 Site Description

The subject property currently contains an apparent wastewater treatment structure. The remainder of the subject property contains open fields and woods. An unimproved driveway, which originates from Zion Church Road, provides access to these structures.

Surface water drainage on the subject property is conveyed via overland flow into the easterly flowing unnamed tributaries of Dirickson Creek, which are located approximately 0.25-mile east of the subject property.

3.1.2 Structures

A 1-story apparent wastewater treatment structure is located on the northcentral portion of the subject property. The wastewater treatment structure is of metal frame construction, and did not appear to be heated.

GTA personnel observed the remains of three previous structures on the northcentral portion of the subject property. Concrete blocks and other debris was present in the general location of the previous structures. As referenced in *Sections 3.3* and *4.1*, these former structures are the apparent remains of three apartment buildings previously located on the subject property.

3.1.3 Storage Tanks

GTA personnel observed four manhole covers near the former structures on the northcentral portion of the subject property. These covers were marked as pertaining to an on-site wastewater treatment system.

GTA personnel did not observe other obvious indications of ASTs or surface features that would be indicative of USTs (e.g., fill pipes, vent pipes, manholes) on the subject property.

3.1.4 Petroleum Compounds/Hazardous Substances

Aside from the wastewater treatment tanks referenced in *Section 3.1.3*, GTA personnel did not observe indications of the use, storage, or disposal of petroleum compounds or hazardous substances on the subject property.

Several pole-mounted transformers are located on and near the subject property. GTA personnel did not observe obvious signs of leaks or spills in the vicinity of the transformers.

3.1.5 Solid Waste

GTA personnel did not observe obvious indications of landfilling or buried waste on the subject property.

3.1.6 Utilities

Overhead electrical and telephone lines extend across the northern border of the subject property along Zion Church Road. As referenced in *Sections 3.1.3* and *3.1.4*, four manhole covers were observed near the former structures on the northcentral portion of the site. An additional manhole cover marked as "Sanitary Sewer" was observed along the access road to the fields on the central portion of the site. No other obvious indications of utility services were observed on the subject property.

3.1.7 Other Site Information

Various areas of minor nuisance dumping were observed on the subject property, primarily within wooded areas on the central portion of the site. The majority of the debris included scrap metal and discarded household refuse. A pond is located within a wooded area on the central portion of the subject property. Several apparent irrigation channels were present on the northern and central portion of the subject property. GTA personnel did not observe other obvious indications of stained soil, stressed vegetation, monitoring wells, pits, ponds, or lagoons on the subject property.

3.2 Surrounding Land Uses

The subject property is bordered to the north by Zion Church Road followed by a personal storage facility and woods; to the east by woods followed by residential development; to the west by open fields and woods followed by residential development; and, to the south by the former Hitchens Pit site, a mobile home community, open fields, and woods

In general, land uses in the site vicinity consist of residential development, open fields, undeveloped woods, and scattered commercial developments. The former Hitchens Pit, as described in *Section 5.2*, is located adjacently southeast of the subject property. According to Delaware Department of Natural Resources and Environmental Control (DNREC) records, the site has been administratively closed since 2017. GTA personnel did not observe other indications of gasoline stations, dry cleaners, landfills, industrial areas, or similar sites of known environmental concern within an approximate ¼-mile radius of the subject property.

Locally, surficial drainage is collected by the easterly flowing unnamed tributaries of Dirickson Creek located 0.25-mile east of the subject property. The subject property appears to receive some surficial drainage from residential areas located south of the subject property. Accordingly, surficial drainage from upgradient sources is unlikely to have adversely affected the environmental condition of the subject property.

3.3 Interviews

On June 25, 2019, GTA personnel interviewed Mr. Ned Howe, the son of the previous owner of the subject property. Mr. Howe indicated that his father had previously owned the subject property and is now deceased. Mr. Howe understood that there had previously been apartment structures on the northern portion of the site and along Zion Church Road, but he was not familiar with the remainder of the subject property. Mr. Howe indicated that he was not aware of environmental issues associated with the site.

GTA provided the Client with a User questionnaire regarding Bayside Developers LLC's knowledge of environmental concerns associated with the subject property. A response from Bayside Developers LLC is pending at this time. If such information is received at a later date and materially alters the findings of this ESA, GTA will submit an addendum to the Client. A copy of GTA's User questionnaire is included in *Appendix C*.

4.0 SITE HISTORY

4.1 Aerial Photographs

In an effort to assess historical land use practices on the site and in the vicinity, GTA reviewed aerial photographs dated 1937, 1953, 1954, 1961, 1963, 1968, 1981, 1992, 2002, 2005, 2006, 2007, 2009, 2010, 2011, 2015, and 2017 maintained by the Delaware Environmental Monitoring and Analysis Center, Nationwide Environmental Title Research, and Google. Copies of the 1954 and 2017 aerial photographs are included as *Figures 4* and *5*, respectively. A summary of GTA's interpretation of the aerial photographs follows. The aerials were reviewed chronologically, and significant land use changes that were observed are described below.

The 1937 aerial photograph indicates that the majority of the subject property consisted of open land, which appeared to have been used for agricultural purposes, with areas of woodlands located on the southern portion of the site. In addition, several apparent structures were present on the northern portion of the site along Zion Church Road. The site vicinity contained open land, undeveloped woods, farms, and scattered residences. No indications of large-scale industrial or commercial land uses were observed near the subject property.

The 1953 and 1954 (*Figure 4*) aerial photographs indicate that an apparent farm complex was located on the northern portion of the site along Zion Church Road. The remaining land uses on the site were generally consistent with the 1937 aerial photograph. Land uses in the site vicinity included an increase in apparent farms and scattered residences.

The 1961, 1963, and 1968 aerial photographs indicate conditions generally consistent with the 1954 aerial photograph. Due to the poor quality of the 1961 and 1968 aerial photographs, GTA personnel's observations were limited.

The 1981 aerial photograph indicates that the structures on the northern portion of the site were no longer present. An apparent increase in residential development was observed west of the subject property. An area of disturbed land southeast of the subject property, in the approximate location of the Hitchens Pit, was observed.

The 1992 and 2002 aerial photograph indicates that three structures and associated parking areas were located on the northern portion of the site along Zion Church Road. These structures were consistent with the described location of the former apartment structures referenced in *Sections 3.1.3* and *3.3*. An area of disturbed land was present within the wooded area on the southern portion of the site. In addition, an apparent pond was present in the approximate location of the disturbance by the 1992 aerial photograph. An area of apparently disturbed land was observed in the approximate location of the Hitchens Pit. Remaining land uses in the site vicinity included a gradual increase in residential development.

The 2005, 2006, and 2007 aerial photographs indicate that a fourth structure was present within a lightly wooded area on the northern portion of the subject property. An area of stressed vegetation was observed near the pond on the southern portion of the subject property. Apparent residential development was observed south of the subject property off of Bear Hole Road.

The 2009 aerial photograph indicates that an area of stressed vegetation was located in an open field on the northeastern portion of the subject property. Wooded land west of the subject property was cleared. The remaining conditions on the site and in the site vicinity were generally consistent with the 2007 aerial photograph.

The 2010, 2011, 2015, and 2017 (*Figure 5*) aerial photographs indicate that three of the four structures on the northern portion of the site were razed by the 2017 aerial photograph. The remaining site conditions were generally consistent with the 2009 aerial photograph. Land uses in the site vicinity included a gradual increase in apparent residential development.

4.2 Historical Maps

On GTA's behalf, Environmental Data Resources, Inc. (EDR) conducted a search for *Sanborn Fire Insurance Maps* for the site and vicinity. According to EDR, no *Sanborn Fire Insurance Maps* were found in its collection that provided coverage for the subject property or vicinity. A copy of the EDR "Sanborn Map Report" page is included in *Appendix C*.

GTA reviewed previous editions of the USGS Topographic Quadrangle Maps, dated 1901, 1910, 1921, 1938, 1942, 1943, 1946, 1961, 1962, 1969, 1973, 1982, 1983, 1992, 2014, and 2016 maintained by Nationwide Environmental Title Research. The 1901, 1910, and 1921 USGS Maps did not identify the ground cover on the subject property or in the site vicinity. Two structures are depicted on the northern and central portions of the site as early as the 1901 USGS Map. Two additional apparent structures are depicted on the southern portion of the site on the 1973 USGS Map but not on additional maps. A stream is also depicted leading through the southern portion of the site in a west to east orientation, on the 1901-1961 USGS Maps. Multiple apparent drainage channels are present on the northern portion of the subject property as early as the 1969 aerial photograph. A gravel pit is depicted in the approximate location of the

Hitchens Pit on the 1992 USGS Map. Land uses in the site vicinity included a gradual increase in apparent residential and commercial manufacturing development, especially to the north, south, and west. Remaining land uses on the subject property and in the site vicinity appeared generally consistent with those observed on the aerial photographs.

4.3 Other Sources

GTA was not supplied with chain of title documentation concerning the subject property. Based on the availability of other historical resources summarized herein, no city directories were reviewed as part of this ESA.

4.4 Previous Reports

GTA requested copies of previous ESAs or other environmental investigations from the Client. The Client indicated that they were not aware of other ESAs or other environmental investigations of the site. Due to aforementioned limitations with the property owner interview, GTA was unable to request copies of previous ESAs or other environmental investigations from the previous property owner.

4.5 Historical Summary

Based on a review of historical information, an apparent farm complex had been located on the northern portion of the subject property since at least 1901. The majority of the site historically consisted of agricultural fields, with areas of woodlands located on the southern portion of the site. The apparent farm complex was razed from the site prior to 1981. Three additional structures were present on the northern portion of the site by 1992, and a fourth structure was present on the northern portion of the site by 2005. Three of these structures were razed from the site by 2017. Two additional structures were depicted on the 1973 USGS Map. Obvious indications of these structures are not depicted on additional USGS maps or other aerial photographs. Land uses in the site vicinity have historically included open land, woods, farms, and scattered residences. The Hitchens Pit dumping site is located adjacently southeast of the subject property. According to DNREC, the Hitchens Pit was formerly a site of environmental regulation, but the regulatory site was closed as of January 11, 2017.

5.0 REGULATORY INFORMATION

5.1 Local Regulatory Review

GTA submitted written inquiries, dated May 21, 2019, to the DNREC concerning potential environmental issues associated with the subject property. Responses from the Emergency Prevention and Response, Solid and Hazardous Waste Management Branch, Site Investigation and Restoration Branch, Environmental Crimes Unit, Air Quality Management, and Tank Management Branch divisions indicated that no associated files were available in regards to the subject property. Copies of GTA's written inquiries and the DNREC responses are included in *Appendix C*.

In addition, GTA personnel reviewed the DNREC Environmental Navigator on June 14, 2019. The Environmental Navigator indicates that the subject property is not identified as a site of environmental concern or regulation. The Environmental Navigator identified the Hitchens Pit 0.10-mile southeast of the subject property. According to DNREC records, the Hitchens Pit was identified as an Investigation and Restoration Section (SIRS) site and was used as a demolition debris disposal site. DNREC records indicate that the site was recommended to the Solid Waste Branch for further investigation, but do not contain additional regulatory information. The Hitchens Pit site is further discussed in *Section 5.2*.

5.2 Federal and State Agency Database Review

GTA retained EDR to perform an ASTM Standard search of Federal and State environmental regulatory agency databases for the subject property and vicinity. The EDR Radius Map™ Report, dated May 21, 2019, is included as *Appendix D*. In some cases, GTA may have requested that EDR increase the ASTM Standard search distances due to the size or shape of the subject property. The EDR Report also includes a list of "Non-Geocoded" sites, which EDR indicates could not be plotted on its part due to insufficient address and/or geographic coordinate information.

GTA attempted to field-verify the locations of the EDR-identified regulatory sites. GTA also reviewed the list of Non-Geocoded sites and based on the descriptions provided, attempted to verify if any are located within the specified search radii. Therefore, the sites discussed in this

section may be a subset of those contained in the EDR Report. The two tables below summarize the regulatory databases that were searched, followed by GTA's summary of the results.

FEDERAL DATABASES SEARCHED BY EDR		
Database	**Description**	**ASTM Search Distance**
NPL	National Priority List. Subset of CERCLIS. Sites for priority cleanup under the Superfund program.	1-mile
Delisted NPL	Delisted National Priority List sites	½-mile
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System. Sites that are proposed for or on the NPL, or in the screening or assessment phase for possible inclusion on the NPL.	½-mile
CERCLIS-NFRAP	Archived CERCLIS sites with a status of No Further Remedial Action Planned (NFRAP), denoting sites where, following an initial investigation, either no contamination was found, contamination was removed quickly without need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. The NFRAP status does not necessarily indicate that no environmental concerns are present.	½-mile
RCRA COR	Hazardous waste handlers with Resource Conservation and Recovery Act (RCRA) corrective action activity.	1-mile
RCRA TSD	Resource Conservation and Recovery Information System, hazardous waste Treatment, Storage, and Disposal Facilities.	½-mile
RCRIS LQG	RCRIS sites that are hazardous waste large-quantity generators.	Subject property and adjoining properties
RCRIS SQG	RCRIS sites that are hazardous waste small-quantity generators.	Subject property and adjoining properties
IC/EC	Institutional Controls or Engineering Controls maintained for the purpose of tracking sites that may contain residual contamination and activity and use limitations.	Subject property
ERNS	Emergency Response Notification System. Information on releases of oil and hazardous substances.	Subject property

STATE & TRIBAL DATABASES SEARCHED BY EDR		
Database	**Description**	**ASTM Search Distance**
NPL	Equivalent of Federal NPL sites.	1-mile
STATE SITES	State Hazardous Waste Sites, which is the state equivalent to CERCLIS.	½-mile
SWL	Solid Waste Acceptance Facilities/Landfills, which may include active or inactive facilities, landfills, or open dumps.	½-mile
UST/AST	Registered underground and above-ground storage tank sites.	Subject property and adjoining properties
LUST	Leaking underground storage tanks (LUST) or similar cases, such as other below ground releases, leaking above-ground storage tanks (LASTs), spills, and inspections.	½-mile
Brownfields	DNREC/EPA Voluntary Cleanup Program	½-mile
IC/EC	Equivalent to Federal IC/EC Registries.	Subject property

The EDR Report identified one site that appear to correspond to the subject property. The EDR Report identified the following regulatory sites located within the previously identified search distances.

EDR RESULTS SUMMARY			
Site Description	**Database**	**Details**	**Approximate Distance/Direction from Subject Property**
Twin Cedars Zion Church Road	FINDS	Details: Permits for Groundwater Discharge-Large Wastewater Systems and Basic Wetlands Application; on-site wastewater differentiable treatment system tanks remaining on subject property as of 2017	Subject Property
Hitchens Pit RD 390 A	SEMS-ARCHIVE SHWS	DNREC Status: Closed Closure Date: 1-11-2017 NPL Status: Not on the NPL Non NPL Status: NFRAP – Site does not qualify for the NPL based on existing information Site Type: Debris Disposal Area	0.10-mile / Southeast
Savage Residence 37024 Johnson Road	LUST	Status: Inactive Date Closed: 3-21-19	0.30-mile / East

Based on this information, the subject property has an open permit for a large wastewater system that was previously active. According to a 2017 DNREC inspection, the buildings for the wastewater system were razed. Based on GTA personnel's site observations, at least one structure apparently associated with the wastewater system is still present on the site. The DNREC records indicate that the associated on-site wastewater treatment disposal system tanks remained on the subject property. DNREC records additionally indicate that a basic wetlands application is on file for the subject property for the Charles Black Company, LLC. Based on this information, it is unlikely that these EDR-identified environmental conditions have adversely impacted the subject property.

Based on this information, the Hitchens Pit is located 0.10-mile southeast of the subject property. GTA personnel contacted DNREC for additional information on the Hitchens Pit and were supplied with a DNREC *Memorandum,* dated January 11, 2017. The *Memorandum* states that DNREC's SIRS administratively closed the site based on there no longer being evidence of construction debris present. The *Memorandum* also cites a preliminary assessment performed in

November of 1989 that determined that no hazardous substances were present and that "no further action was recommended by DNREC SIRS." Based on this information, it is unlikely that the EDR-identified site has adversely impacted the subject property. A copy of GTA's inquiry regarding the Hitchens Pit and the DNREC *Memorandum* is included in *Appendix C.*

Based on the distances from the remaining surrounding regulatory site to the subject property and its regulatory statuses, it is unlikely that the EDR-identified regulatory site has adversely impacted the subject property. Additionally, the regulatory records and surrounding land uses do not indicate that a vapor migration concern at the subject property is likely. Additional regulatory sites and several non-ASTM scope databases were also identified by EDR that are not displayed above. This information is available within *Appendix D*.

6.0 FINDINGS

6.1 Summary

The subject property comprises approximately 64.34 of land located along the south side of Zion Church Road in the Selbyville area of Sussex County, Delaware. The subject property is identified as Parcel 5-33-11.00-42.00. The subject property currently contains an apparent wastewater treatment structure, open fields, and undeveloped woods. Historically, the majority of the subject property has consisted of open fields and undeveloped woods similar to current conditions. In addition, several apparent structures were present on the northern portion of the subject property, along Zion Church Road, as early as 1938. These structures were no longer present by 1981. By 1992, three additional structures were constructed on the northern portion of the site. A fourth structure was added in 2005. Three of the four structures were razed by 2017. GTA personnel did not observe obvious indications of ASTs, USTs, groundwater monitoring wells, or similar environmental concerns in association with the subject property. The subject property was identified as the site of a groundwater discharge permit for a previous large wastewater system and a basic wetlands application.

The surrounding vicinity currently contains open land, undeveloped woods, and scattered residential developments. Historically, the surrounding vicinity contained open land, undeveloped woods, farms, and scattered residential development. The Hitchens Pit, a

construction debris dumping site is located approximately 0.10-mile southeast of the subject property. According to correspondence with the DNREC, the site has been administratively closed since 2017. Additionally, DNREC records indicate that a 1989 investigation of the site determined that no hazardous substances were present and that "no further action was recommended." A Federal and State environmental regulatory database report identified the former Hitchens Pit and an additional site of environmental concern or regulation in the surrounding vicinity. Based on their locations relative to the subject property and/or their regulatory statuses, the identified regulatory sites are unlikely to have adversely impacted the environmental quality of the subject property.

6.2 Conclusions

GTA has performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM Practice E1527-13 of the subject property (Twin Cedars), as described herein. Any exceptions to, or deletions from, this practice are described in *Section 1.3* of this Report. This assessment has revealed no evidence of RECs in connection with the subject property.

******* END OF REPORT *******

Important Information about This

Geoenvironmental Report

Geoenvironmental studies are commissioned to gain information about environmental conditions on and beneath the surface of a site. The more comprehensive the study, the more reliable the assessment is likely to be. But remember: Any such assessment is to a greater or lesser extent based on professional opinions about conditions that cannot be seen or tested. Accordingly, no matter how many data are developed, risks created by unanticipated conditions will always remain. *Have realistic expectations.* Work with your geoenvironmental consultant to manage known and unknown risks. Part of that process should already have been accomplished, through the risk allocation provisions you and your geoenvironmental professional discussed and included in your contract's general terms and conditions. This document is intended to explain some of the concepts that may be included in your agreement, and to pass along information and suggestions to help you manage your risk.

Beware of Change; Keep Your Geoenvironmental Professional Advised

The design of a geoenvironmental study considers a variety of factors that are subject to change. Changes can undermine the applicability of a report's findings, conclusions, and recommendations. *Advise your geoenvironmental professional about any changes you become aware of.* Geoenvironmental professionals cannot accept responsibility or liability for problems that occur because a report fails to consider conditions that did not exist when the study was designed. Ask your geoenvironmental professional about the types of changes you should be particularly alert to. Some of the most common include:

- modification of the proposed development or ownership group,
- sale or other property transfer,
- replacement of or additions to the financing entity,
- amendment of existing regulations or introduction of new ones, or
- changes in the use or condition of adjacent property.

Should you become aware of any change, *do not rely on a geoenvironmental report.* Advise your geoenvironmental professional immediately; follow the professional's advice.

Recognize the Impact of Time

A geoenvironmental professional's findings, recommendations, and conclusions cannot remain valid indefinitely. The more time that passes, the more likely it is that important latent changes will occur. *Do not rely on a geoenvironmental report if too much time has elapsed since it was completed.* Ask your environmental professional to define "too much time." In the case of Phase I Environmental Site Assessments (ESAs), for example, more than 180 days after submission is generally considered "too much."

Prepare To Deal with Unanticipated Conditions

The findings, recommendations, and conclusions of a Phase I ESA report typically are based on a review of historical information, interviews, a site "walkover," and other forms of noninvasive research. When site subsurface conditions are not sampled in any way, the risk of unanticipated conditions is higher than it would otherwise be.

While borings, installation of monitoring wells, and similar invasive test methods can help reduce the risk of unanticipated conditions, *do not overvalue the effectiveness of testing.* Testing provides information about actual conditions only at the precise locations where samples are taken, and only when they are taken. Your geoenvironmental

professional has applied that specific information to develop a general opinion about environmental conditions. *Actual conditions in areas not sampled may differ (sometimes sharply) from those predicted in a report.* For example, a site may contain an unregistered underground storage tank that shows no surface trace of its existence. *Even conditions in areas that were tested can change*, sometimes suddenly, due to any number of events, not the least of which include occurrences at adjacent sites. Recognize, too, that *even some conditions in tested areas may go undiscovered,* because the tests or analytical methods used were designed to detect only those conditions assumed to exist.

Manage your risks by retaining your geoenvironmental professional to work with you as the project proceeds. Establish a contingency fund or other means to enable your geoenvironmental professional to respond rapidly, in order to limit the impact of unforeseen conditions. And to help prevent any misunderstanding, identify those empowered to authorize changes and the administrative procedures that should be followed.

Do Not Permit Any Other Party To Rely on the Report

Geoenvironmental professionals design their studies and prepare their reports to meet the specific needs of the clients who retain them, in light of the risk management methods that the client and geoenvironmental professional agree to, and the statutory, regulatory, or other requirements that apply. The study designed for a developer may differ sharply from one designed for a lender, insurer, public agency...or even another developer. *Unless the report specifically states otherwise, it was developed for you and only you.* Do not unilaterally permit any other party to rely on it. The report and the study underlying it may not be adequate for another party's needs, and you could be held liable for shortcomings your geoenvironmental professional was powerless to prevent or anticipate. Inform your geoenvironmental professional when you know or expect that someone else—a third-party—will want to use or rely on the report. *Do not permit third-party use or reliance until you first confer with the geoenvironmental professional who prepared the report.* Additional testing, analysis, or study may be required and, in any event, appropriate terms and conditions should be agreed to so both you and your geoenvironmental professional are protected from third-party risks. *Any party who relies on a geoenvironmental report without the express written permission of the professional who prepared it and the client for whom it was prepared may be solely liable for any problems that arise.*

Avoid Misinterpretation of the Report

Design professionals and other parties may want to rely on the report in developing plans and specifications. They need to be advised, in writing, that their needs may not have been considered when the study's scope was developed, and, even if their needs were considered, they might misinterpret geoenvironmental findings, conclusions, and recommendations. *Commission your geoenvironmental professional to explain pertinent elements of the report to others who are permitted to rely on it, and to review any plans, specifications or other instruments of professional service that incorporate any of the report's findings, conclusions, or recommendations.* Your geoenvironmental professional has the best understanding of the issues involved, including the fundamental assumptions that underpinned the study's scope.

Give Contractors Access to the Report

Reduce the risk of delays, claims, and disputes by giving contractors access to the full report, *providing that it is accompanied by a letter of transmittal that can protect you* by making it unquestionably clear that: 1) the study was not conducted and the report was not prepared for purposes of bid development, and 2) the findings, conclusions, and recommendations included in the report are based on a variety of opinions, inferences, and assumptions and are subject to interpretation. Use the letter to also advise contractors to consult with your geoenvironmental professional to obtain clarifications, interpretations, and guidance (a fee may be required for this service), and that—in any event—they should conduct additional studies to obtain the specific type and extent of information each prefers for preparing a bid or cost estimate. Providing access to the full report, with the appropriate caveats, helps prevent formation of adversarial attitudes and claims of concealed or differing conditions. If a contractor elects to ignore the warnings and advice in the letter of transmittal, it would do so at its own risk. Your geoenvironmental professional should be able to help you prepare an effective letter.

Do Not Separate Documentation from the Report

Geoenvironmental reports often include supplemental documentation, such as maps and copies of regulatory files, permits, registrations, citations, and correspondence with regulatory agencies. If subsurface explorations were performed, the report may contain final boring logs and copies of laboratory data. If remediation activities occurred on site, the report may include: copies of daily field reports; waste manifests; and information about the disturbance of subsurface materials, the type and thickness of any fill placed on site, and fill placement practices, among other types of documentation. *Do not separate supplemental documentation from the report. Do not, and do not permit any other party to redraw or modify any of the supplemental documentation for incorporation into other professionals' instruments of service.*

Understand the Role of Standards

Unless they are incorporated into statutes or regulations, standard practices and standard guides developed by the American Society for Testing and Materials (ASTM) and other recognized standards-developing organizations (SDOs) are little more than aspirational methods agreed to by a consensus of a committee. The committees that develop standards may not comprise those best-qualified to establish methods and, no matter what, no standard method can possibly consider the infinite client- and project-specific variables that fly in the face of the theoretical "standard conditions" to which standard practices and standard guides apply. In fact, these variables can be so pronounced that geoenvironmental professionals who comply with every directive of an ASTM or other standard procedure could run afoul of local custom and practice, thus violating the standard of care. Accordingly, when geoenvironmental professionals indicate in their reports that they have performed a service "in general compliance" with one standard or another, it means they have applied professional judgement in creating and implementing a scope of service designed for the specific client and project involved, and which follows some of the general precepts laid out in the referenced standard. To the extent that a report indicates "general compliance" with a standard, you may wish to speak with your geoenvironmental professional to learn more about what was and was not done. *Do not assume a given standard was followed to the letter.* Research indicates that that seldom is the case.

Realize That Recommendations May Not Be Final

The technical recommendations included in a geoenvironmental report are based on assumptions about actual conditions, and so are preliminary or tentative. Final recommendations can be prepared only by observing actual conditions as they are exposed. For that reason, you should retain the geoenvironmental professional of record to observe construction and/or remediation activities on site, to permit rapid response to unanticipated conditions. *The geoenvironmental professional who prepared the report cannot assume responsibility or liability for the report's recommendations if that professional is not retained to observe relevant site operations.*

Understand That Geotechnical Issues Have Not Been Addressed

Unless geotechnical engineering was specifically included in the scope of professional service, a report is not likely to relate any findings, conclusions, or recommendations about the suitability of subsurface materials for construction purposes, especially when site remediation has been accomplished through the removal, replacement, encapsulation, or chemical treatment of on-site soils. The equipment, techniques, and testing used by geotechnical engineers differ markedly from those used by geoenvironmental professionals; their education, training, and experience are also significantly different. If you plan to build on the subject site, but have not yet had a geotechnical engineering study conducted, your geoenvironmental professional should be able to provide guidance about the next steps you should take. The same firm may provide the services you need.

Read Responsibility Provisions Closely

Geoenvironmental studies cannot be exact; they are based on professional judgement and opinion. Nonetheless, some clients, contractors, and others assume geoenvironmental reports are or certainly should be unerringly precise. Such assumptions have created unrealistic expectations that have led to wholly unwarranted claims and disputes. To help prevent such problems, geoenvironmental professionals have developed a number of report provisions and contract terms that explain who is responsible for what, and how risks are to be allocated. Some people mistake these for "exculpatory clauses," that is, provisions whose purpose is to transfer one party's rightful responsibilities and liabilities to someone else. Read the responsibility provisions included in a report and in the contract you and your geoenvironmental professional agreed to. *Responsibility provisions are not "boilerplate."* They are important.

Rely on Your Geoenvironmental Professional for Additional Assistance

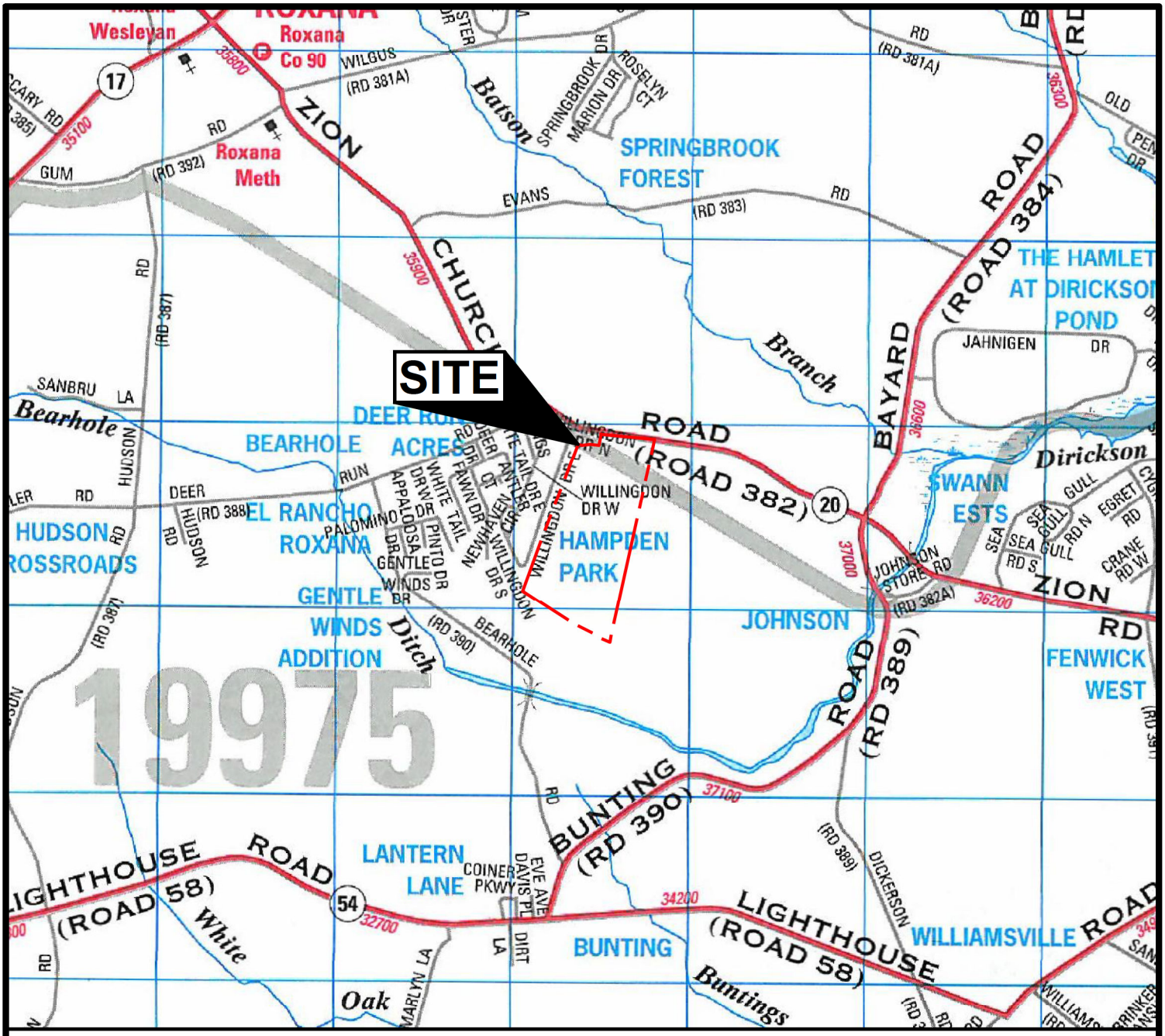
Membership in the Geoprofessional Business Association exposes geoenvironmental professionals to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a geoenvironmental project. Confer with your GBA-member geoenvironmental professional for more information.

GEOPROFESSIONAL BUSINESS ASSOCIATION

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX A

FIGURES



SOURCE: MAP ADAPTED FROM A STREET MAP OF SUSSEX COUNTY, DELAWARE PRODUCED AND MAINTAINED BY ADC MAPS, COPYRIGHT ADC THE MAP PEOPLE BY PERMISSION PERMITTED USE NUMBER 21006238

LEGEND

SUBJECT PROPERTY

NORTH

0' 500' 1,000' 2,000' 4,000'

SCALE: 1"=2,000'

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

SITE LOCATION MAP

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
31190731	1"=2000'	MAY 2019	KMT	SAG	1

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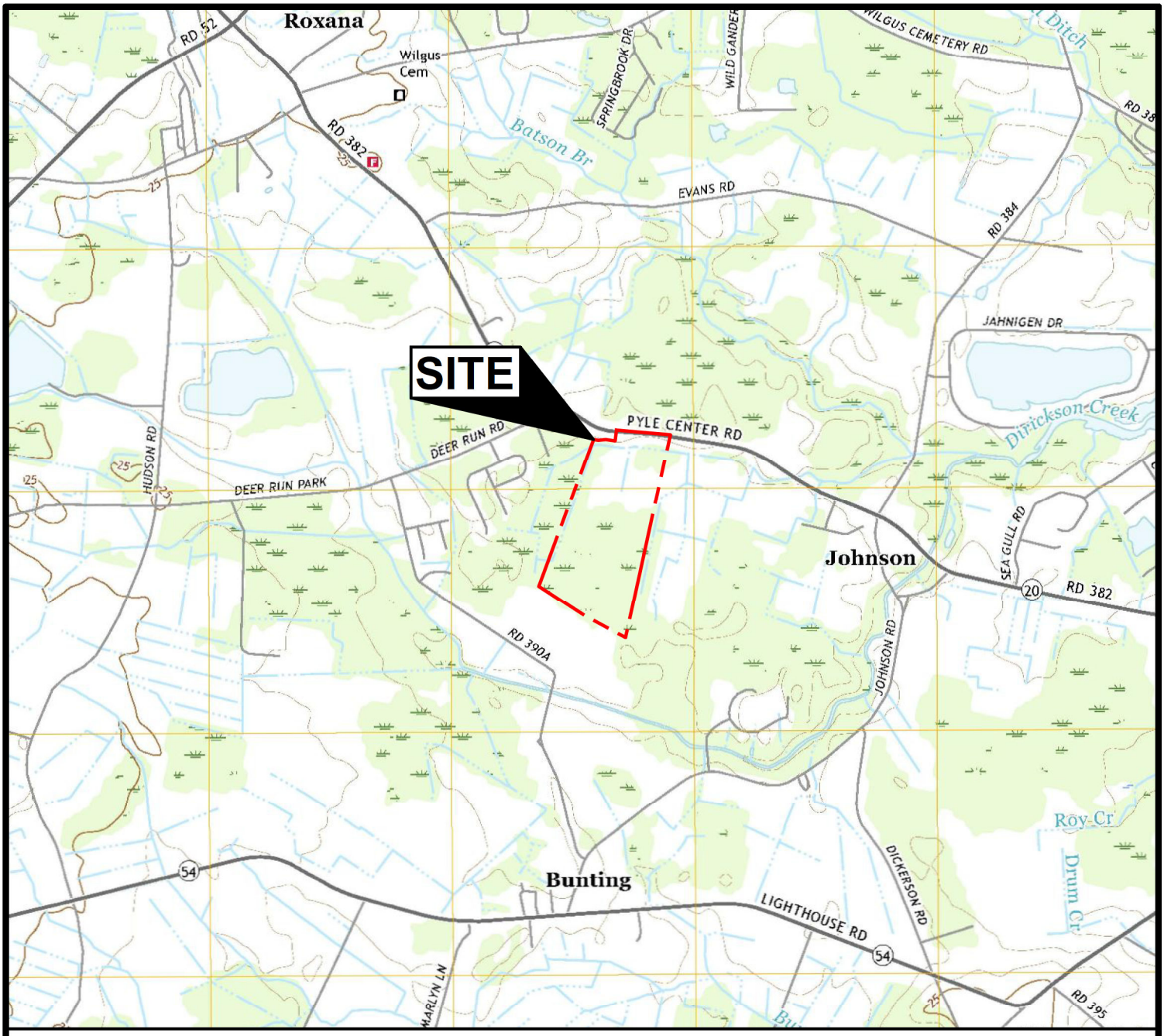

SOURCE: MAP ADAPTED FROM THE 2016 USGS TOPOGRAPHIC QUADRANGLE OF SELBYVILLE, DELAWARE

LEGEND

SUBJECT PROPERTY

NORTH

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SCALE: 1"=2,000'

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

TOPOGRAPHIC MAP

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	3119073	SCALE:	1"=200	DATE:	MAY 201	DRAWN BY:	KM	REVIEW BY:	SAG	FIGURE:	2

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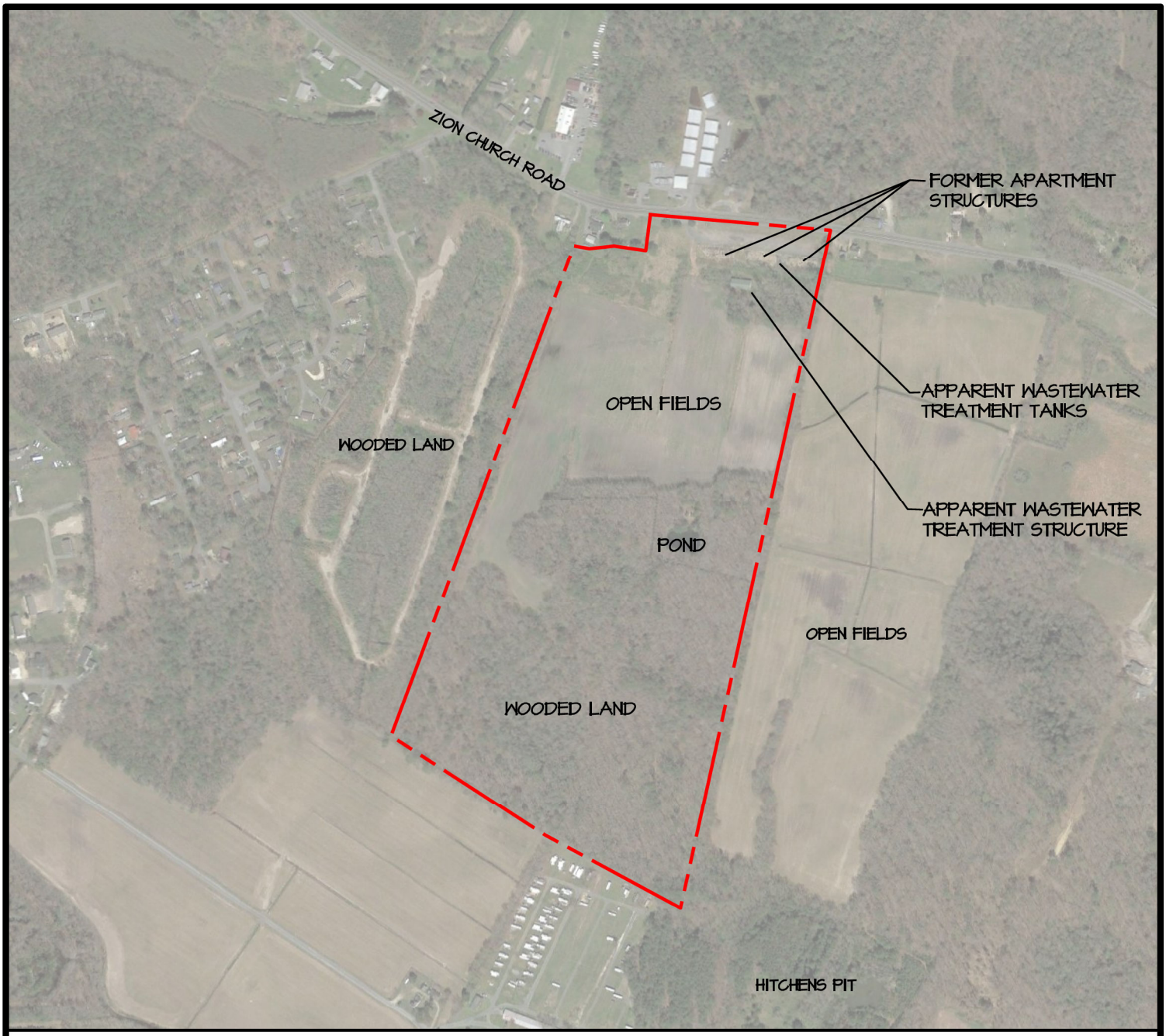

SOURCE: MAP ADAPTED FROM 2017 AERIAL IMAGERY OF SUSSEX COUNTY, DELAWARE, PRODUCED AND MAINTAINED BY GOOGLE EARTH <WWW.EARTH.GOOGLE.COM>

LEGEND

SUBJECT PROPERTY

NORTH

0' 150' 300' 600' 1,200'

SCALE: 1"=600'

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

SITE SKETCH

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
31190731	1"=600'	MAY 2019	KMT	SAG	3

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SOURCE: MAP ADAPTED FROM A 1954 AERIAL PHOTOGRAPH MAINTAINED BY DELAWARE ENVIRONMENTAL MONITORING AND ANALYSIS CENTER <WWW.DEMAC.UDEL.EDU/DATA/AERIAL-PHOTOGRAPHY/>

LEGEND

SUBJECT PROPERTY

NORTH

0' 250' 500' 1,000' 2,000'

SCALE: 1"=1,000'

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

1954 AERIAL PHOTOGRAPH

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	31190731	SCALE:	1"=1000'	DATE:	MAY 2019	DRAWN BY:	KMT	REVIEW BY:	SAG	FIGURE:	4

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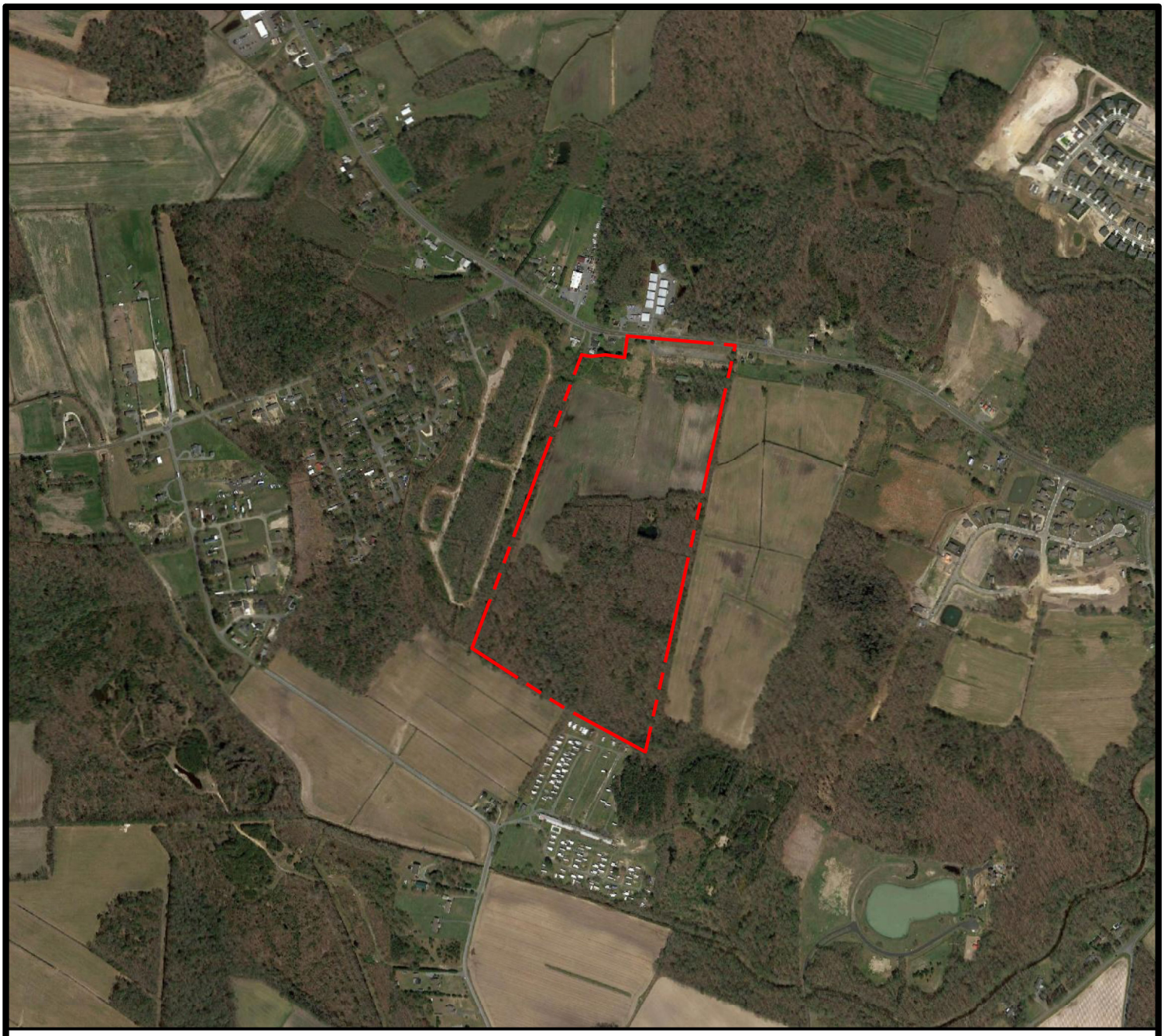

SOURCE: MAP ADAPTED FROM 2017 AERIAL IMAGERY OF SUSSEX COUNTY, DELAWARE, PRODUCED AND MAINTAINED BY GOOGLE EARTH <WWW.EARTH.GOOGLE.COM>

LEGEND

SUBJECT PROPERTY

NORTH

0' 250' 500' 1,000' 2,000'

SCALE: 1"=1,000'

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3445-A BOX HILL CORPORATE CENTER DRIVE
ABINGDON, MARYLAND 21009
410-515-9446
FAX: 410-515-4895
WWW.GTAENG.COM

2017 AERIAL PHOTOGRAPH

TWIN CEDARS

SUSSEX COUNTY, DELAWARE

JOB NO.	SCALE:	DATE:	DRAWN BY:	REVIEW BY:	FIGURE:
31190731	1"=1000'	MAY 2019	KMT	SAG	5

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APPENDIX B

SITE PHOTOGRAPHS

PROJECT NAME: Twin Cedars
DATE PHOTOGRAPHED: June 27, 2019
GTA PROJECT NUMBER: 31190731

PHOTOGRAPH 1: Northern portion of the site facing east along Zion Church Road.

PHOTOGRAPH 2: Northern portion of the site facing west along Zion Church Road.

PHOTOGRAPH 3: Debris associated with apparent former apartment structures on the northern portion of the site.

PHOTOGRAPH 4: Apparent tanks associated with wastewater treatment system on the northern portion of the site.

PROJECT NAME: Twin Cedars
DATE PHOTOGRAPHED: June 27, 2019
GTA PROJECT NUMBER: 31190731

PHOTOGRAPH 5: Apparent wastewater treatment structure on the northcentral portion of the site.

PHOTOGRAPH 6: Pond on the central portion of the subject property.

PHOTOGRAPH 7: Central portion of the site facing northwest.

PHOTOGRAPH 8: Wooded land on the southern portion of the subject property.

APPENDIX C

CORRESPONDENCE

FOIA Request Form

Request Date: Tuesday, May 21, 2019

Public Body

Natural Resources and Environmental Control

Name

Kaelyn Thornton

Mailing Address

3445 Box Hill Corporate Center Drive Suite A

Mailing Address (optional)

Address 2 (optional)

Mailing Address (optional)

Address 3 (optional)

City

Abingdon

State

Maryland

Zip

21009

Phone

4105159446

E-mail

kthornton@gtaeng.com

Records Requested

Be as specific as you can , describing types of records, dates, parties to correspondence, subject matter, etc. The public body will make every reasonable effort to assist you in identifying the records being sought.

Note: Requests for voluminous records may be delayed.

This request is in reference to a property called Twin Cedars. The property has no listed address; however, it is located along the south side of Zion Church Road in the Selbyville area of Sussex County, Delaware. The site is Parcel 5-33-11.00-42.00 and is 64.34 acres. GTA is requesting records of any environmental spills, incidents, releases, or cleanups; open, closed, or proposed landfills or dump sites; hazardous waste facilities; leaking underground storage tanks ; or similar types of records regarding the environmental condition of the property. The purpose of this is for a Phase I Environmental Site Assessment. Thank you.

There may be costs involved in responding to your request. The public body can require you to examine the records at the office of the public body. Refer to the public body's policy or regulation for information about costs and access to records.

Please contact me if costs will be greater than

1.00

Hagley Museum was originally the du Pont black powder manufactory, estate, and gardens.

What's Trending

Attorney General
State Treasurer
Motor Vehicles
Labor
Corporations
Education
Governor
Health

From: Sobocinski, Lee (DNREC)
To: Thornton, Kaelyn
Cc: FOIA, DNREC (MailBox Resources)
Subject: FOIA Request 442 Response
Date: Thursday, May 30, 2019 2:49:21 PM

Dear Ms. Thornton:

This email is in response to your Freedom of Information Act (FOIA) request on May 21, 2019. You requested:

> *"This request is in reference to a property called Twin Cedars. The property has no listed address; however, it is located along the south side of Zion Church Road in the Selbyville area of Sussex County, Delaware. The site is Parcel 5-33-11.00-42.00 and is 64.34 acres. GTA is requesting records of any environmental spills, incidents, releases, or cleanups; open, closed, or proposed landfills or dump sites; hazardous waste facilities; leaking underground storage tanks ; or similar types of records regarding the environmental condition of the property. The purpose of this is for a Phase I Environmental Site Assessment. Thank you."*

A records search by the Division of Air Quality, the Division of Waste and Hazardous Substances, and the Division of Community Affairs (ECU) returned no records responsive to your inquiry.

Thank you for your FOIA inquiry. DNREC considers your request closed at this time.

S. Lee Sobocinski
DNREC FOIA Coordinator
Department of Natural Resources and
Environmental Control
89 Kings Highway
Dover, DE 19901
(P) 302-739-9365
(F) 302-739-6242
lee.sobocinski@delaware.gov
Effective January 25, 2019, my email address changed to lee.sobocinski@delaware.gov. Please update your contact information accordingly.

From: FOIATrac
To: Thornton, Kaelyn
Subject: FOIA Request Info
Date: Tuesday, May 21, 2019 1:13:36 PM

DELAWARE DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

DIVISION OF WASTE AND HAZARDOUS SUBSTANCES

INTERNET ADDRESS: www.awm.delaware.gov

FREEDOM OF INFORMATION ACT RESPONSE FORM

Date:
From:

Solid & Hazardous Waste Management Branch

89 Kings Highway

Dover, DE 19901

302-739-9000

Lee.Sobocinski@state.de.us

To:

Kaelyn Thornton

GTA

3445-A Box Hill Corporate Center Drive

Abingdon, MD 21009

Facility/Site(s): Twin Cedars

Request Disposition:

No records have been found in this branch pursuant to the above referenced request.

Comments:

Should you have any questions, please do not hesitate to call the DNREC FOIA Coordinator.

PLEASE NOTE THE FOLLOWING:

Your request may have been distributed to other Branches applicable. Those Branches will respond individually to your request.

From: FOIATrac
To: Thornton, Kaelyn
Subject: FOIA Request Info
Date: Tuesday, May 21, 2019 2:26:33 PM

DELAWARE DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

DIVISION OF WASTE AND HAZARDOUS SUBSTANCES

INTERNET ADDRESS: www.awm.delaware.gov

FREEDOM OF INFORMATION ACT RESPONSE FORM

Date:
From:

Site Investigation and Restoration Branch

391 Lukens Drive

New Castle , DE 19720

302-739-9000

Lee.Sobocinski@state.de.us

To:

Kaelyn Thornton

GTA

3445-A Box Hill Corporate Center Drive

Abingdon, MD 21009

Facility/Site(s): Twin Cedars

Request Disposition:

No records have been found in this branch pursuant to the above referenced request.

Comments:
Hitchens Pit (DE-0240)
Road 390, Selbyville, DE 19975
http://www.nav.dnrec.delaware.gov/DEN3/Detail/FacilityDetail.aspx?id=10056272&piid=27067

Accessing Delaware Environmental Navigator

Best to use Google Chrome or Internet Explorer
Search for: www.nav.dnrec.delaware.gov/DEN3/

Below are two options for site document searching:

Search Programs Option:
1. On the left side of the page under the NAVIGATION heading,
2. Click the Search Programs link,
a. Enter the Site ID (DE-####) if known; or a specific site name (Ex.: GM Automotive Plant),
b. Under the program option, select the drop-down menu and scroll to Site Investigation and Restoration Site (SIRS).
3. Click Search.
4. The Site ID and Name should appear,
a. Click on the highlighted DE# (Site ID),
5. To the left of the page there will be a NAVIGATION and DETAILS listing,
6. Under DETAILS scroll down to Documents (# of documents),
7. Click on the documents link.
a. A listing of all documents for this site will appear.

Search by Maps Option:
1. Under NAVIGATION on the left side of the page,
2. Click the Search by Maps option,
3. Select the Environmental Control button and Launch Map.
4. To the left under the Main Box,
a. Select the Address Search box.
b. Type address – (Street #/Name, City) and click the search address button.
c. The map of Delaware should narrow down to your searched address.
d. Use the (-) sign to scroll out to view site locations within the area.
Site locations are marked by a red triangle.
5. Click on the red triangle – an information box will appear.
6. Click on View link next to Navigator in the information box.
7. To the left of the screen under Navigator/Details – scroll down to the Documents (# of Docs) link under the Details section.
8. Click the documents button.

9. Listing of all documents should appear.

Note: If when you click on the Documents link and it does not pull up the listing of site documents click on the "Click here to remove this filter and view all facility data" link at the top of the page under the Site Name information. This should remove the filter and allow access to the documents.

Should you have any questions, please do not hesitate to call the DNREC FOIA Coordinator.

PLEASE NOTE THE FOLLOWING:

Your request may have been distributed to other Branches applicable. Those Branches will respond individually to your request.

From: FOIATrac
To: Thornton, Kaelyn
Subject: FOIA Request Info
Date: Thursday, May 30, 2019 9:08:35 AM

DELAWARE DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

DIVISION OF WASTE AND HAZARDOUS SUBSTANCES

INTERNET ADDRESS: www.awm.delaware.gov

FREEDOM OF INFORMATION ACT RESPONSE FORM

Date:
From:

Tank Management Branch

391 Lukens Drive

New Castle, DE 19720

302-739-9000

Lee.Sobocinski@state.de.us

To:

Kaelyn Thornton

GTA

3445-A Box Hill Corporate Center Drive

Abingdon, MD 21009

Facility/Site(s): Twin Cedars

Request Disposition:

No records have been found in this branch pursuant to the above referenced request.

Comments:
Tank Management Section does not have any underground or aboveground storage tank site facility file for your requested site.

Twin Cedars

If you have any questions, please contact DNREC- TMS Melina Lounsbury at 302-395-2500.

Should you have any questions, please do not hesitate to call the DNREC FOIA Coordinator.

PLEASE NOTE THE FOLLOWING:

Your request may have been distributed to other Branches applicable. Those Branches will respond individually to your request.

From: FOIATrac
To: Thornton, Kaelyn
Subject: FOIA Request Info
Date: Wednesday, May 22, 2019 7:21:45 AM

DELAWARE DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

DIVISION OF WASTE AND HAZARDOUS SUBSTANCES

INTERNET ADDRESS: www.awm.delaware.gov

FREEDOM OF INFORMATION ACT RESPONSE FORM

Date:
From:

Emergency Prevention and Response

89 Kings Highway

Dover, DE 19901

302-739-9000

Lee.Sobocinski@state.de.us

To:

Kaelyn Thornton

GTA

3445-A Box Hill Corporate Center Drive

Abingdon, MD 21009

Facility/Site(s): Twin Cedars

Request Disposition:

No records have been found in this branch pursuant to the above referenced request.

Comments:
Without a physical address, not able to search database. not able to search by parcel numbers.

Should you have any questions, please do not hesitate to call the DNREC FOIA Coordinator.

PLEASE NOTE THE FOLLOWING:

Your request may have been distributed to other Branches applicable. Those Branches will respond individually to your request.

From: Chiger, Mariya (DNREC)
To: Geer, Samuel
Cc: Salahuddin, Qazi (DNREC)
Subject: Hitchens Pit Inquiry
Date: Friday, June 14, 2019 12:14:34 PM
Attachments: DE-0240 Closure Memo.pdf

Good Morning Sam,

Hitchens Pit Site (DE-0240) was administratively closed on January 11, 2017 based on a site visit and Preliminary Assessment. Please see attached Closure Memo. The Preliminary Assessment recommended to refer the site to SHWMS, however after the site visit on May 22, 2015, DNREC-SIRS determined to close the site.

Please let me know if you have any other questions,
-Mariya.

Mariya Chiger
Environmental Scientist
Dept. of Natural Resource and Environmental Control
Site Investigation and Restoration Section (SIRS)
Phone: 302-395-2618
Fax: 302-395-2601
Email: mariya.chiger@delaware.gov

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF WASTE AND HAZARDOUS SUBSTANCES
SITE INVESTIGATION & RESTORATION SECTION

MEMORANDUM

To: Hitchens Pit (DE-0240)

Through: Paul Will, Program Manager I, SIRS 1/11/17
Qazi Salahuddin, Program Manager I, SIRS

CC: Sandra Kimbel, Administrative Specialist II, SIRS 1/11/17

From: Eileen Capitoli, Environmental Scientist I, SIRS EC 1/11/17

Date: January 11, 2017

RE: Administratively Closed Site (DE-0240)

DNREC-SIRS has designated the Hitchens Pit (DE-0240) as administratively closed based on a Site visit on May 22, 2015 that showed that the property is now an RV Park and is there is no longer evidence of disposal of construction debris. Also, a preliminary Assessment was performed on November 21, 1989 that determined no hazardous substances were present and that no further action was recommended by DNREC-SIRS. Based on this information it was determined that there is no reason to believe that a release has occurred at the Site that requires actions under the Hazardous Substance Cleanup Act (HSCA).

Details of the investigation and other pertinent information are included in the attached fact sheet for the site. A map for the site showing the site boundary is included. All the documents related to the site are archived and are available for reference. The site polygon will be maintained in the Delaware Environmental Navigator (DEN).

EJC:EJC
EJC17003.doc
DE 0240 II I 4

Site Investigation & Restoration

Department of Natural Resources and Environmental Control (DNREC) • Site Investigation and Restoration Section (SIRS)

SITE FACT SHEET

Hitchens Pit (DE-0240)

SITE DESCRIPTION

The former sand and gravel pit was used as a dumping area for construction and demolition debris in 1989.

SITE LOCATION

The site is located at 37421 Bearhole Road, West Fenwick Island, Selbyville, DE at "Lost Lands RV Park". The former pit is located in the forested area to the west of the RV Park.

CURRENT STATUS

A preliminary assessment (PA) was conducted on the property on November 21,1989. Construction and demolition debris was noted in the pit, and the PA recommended that the site be referred to the DNREC Solid Waste Branch for further investigation. Because hazardous substances were not documented, no further action was taken by DNREC-SIRS. The former property owner was contacted on June 2, 2009. According to him, the property was sold approximately 15 years ago, and a RV Park was built on the property.

Visited site on May 22, 2015. The site is now a RV Park. Administratively closed.

LAST UPDATED 1/4/2017 1:02:59 PM by Eileen.Capitoli

CONTACT

Eileen Capitoli 302-395-2600

SITE OPERATION HISTORY

The site area was excavated for sand and gravel from 1961 to 1964. The sand and gravel was used in the construction of roadways. The site was inactive from 1964 to 1988. In 1989, the property owner (Darrel Hitchins of Hitchins Construction Company) began using the borrow pit for disposal of construction and demolition debris. The debris reportedly consisted of lumber, bricks, concrete, and other rubble.

ENVIRONMENTAL INVESTIGATIONS AND ACTIONS

A PA was conducted at the site in November 1989.The PA recommended that the site be referred to the DNREC Solid and Hazardous Waste Management Section (SHWMS) for further investigation. Contacted the SHWMS in 2015, they have no record of handling the site. Because hazardous substances were not documented, no further action was taken by DNREC-SIRS.

CONTAMINANTS OF POTENTIAL CONCERN (COPC)

There are no contaminants of potential concern associated with the site.

CLEANUP STAGE

No Further Action.

SITE FACT SHEET

Hitchens Pit (DE-0240)

SITE IMAGES

TITLE

Site Location

DATE

02/02/2015

DESCRIPTION

Aerial View from GoogleEarth. Approximate site Location at an RV Park.

TITLE

Hitchens Pit

DATE

05/22/2015

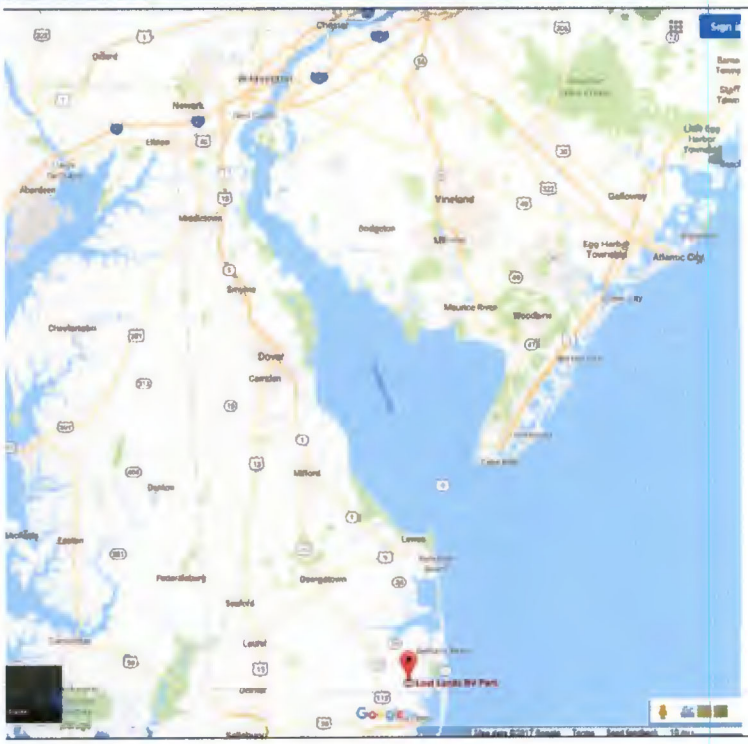
DESCRIPTION

Site Visit. The site is now an RV Park.

SITE FACT SHEET

Hitchens Pit (DE-0240)

SITE MAPS



TITLE

Site Location

DATE

02/02/2015

DESCRIPTION

Site Location Map

PHASE I ENVIRONMENTAL SITE ASSESSMENT
CLIENT INTERVIEW QUESTIONNAIRE

To: Mr. Henry Mast, Bayside Developers, LLC

From: Sam Geer, Geo-Technology Associates, Inc.

Date: June 21, 2019

At your request, Geo-Technology Associates, Inc. (GTA) has started a Phase I Environmental Site Assessment (ESA) of **Twin Cedars** in **Sussex County, Delaware**. As you probably know, we use the Phase I ESA to evaluate the likelihood that the subject property may have been impacted with petroleum or hazardous substances (i.e., we identify Recognized Environmental Conditions [RECs]).

Based on the ASTM Standard (E1527-13), we need to ask you (as our client and the "User" of the report) several questions about the subject property. You've asked us to develop a professional opinion about the subject property's environmental condition. But in order to prepare an ASTM-compliant Phase I ESA, we also need to use any relevant knowledge that you may have.

Please review the questions below and provide your responses (to the best of your knowledge), explaining any "yes" answers at the bottom of the page. Please either return the completed form, or call me to discuss with verbal responses.

1.	Do you know of any environmental cleanup liens against the subject property (filed under federal, tribal, state, or local law)?	☐ Yes ☐ No
2.	Are you aware of any "activity and use limitations" (AULs), such as engineering controls, land use restrictions, institutional controls, that are in place at the subject property? (e.g., deed notice, capped soil, groundwater use restrictions, residential prohibition, etc.)	☐ Yes ☐ No
3.	Do you have any specialized knowledge or experience related to the environmental condition of the subject property or nearby properties? (e.g., familiarity with a particular business activity or land use on or near the site)	☐ Yes ☐ No
4.	Do you have reason to believe that the purchase price of the subject property has been lowered because contamination is known or believed to be present?	☐ Yes ☐ No
5.	Are you aware of information about the subject property that would help identify conditions indicative of releases or threatened releases? (e.g., past uses, above or below ground storage tanks, chemical storage, spills, cleanups, etc.)	☐ Yes ☐ No
6.	Do you know of any obvious indicators that point to the presence or likely presence of contamination at the subject property?	☐ Yes ☐ No

Please explain any "yes" answers:_____

_____

_____

_____

Name _____ Company_____

Signature_____ Date_____

Geo-Technology Associates, Inc., 3445-A Box Hill Corporate Center Drive, Abingdon, MD 21009
Phone: 410-515-9446 Fax: 410-515-4895

Twin Cedars

Zion Church Road

Selbyville, DE 19975

Inquiry Number: 5658753.5

May 21, 2019

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

05/21/19

Site Name:

Twin Cedars
Zion Church Road
Selbyville, DE 19975
EDR Inquiry # 5658753.5

Client Name:

Geo-Technology Associates Inc.
3445-A Box Hill Corporate
Abingdon, MD 21009
Contact: Kaelyn Thornton

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Geo-Technology Associates Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # D864-4E94-B228

PO # 31190731

Project Twin Cedars

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: D864-4E94-B228

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

Geo-Technology Associates Inc. (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

APPENDIX D

EDR RADIUS MAP™ REPORT

Twin Cedars
Zion Church Road
Selbyville, DE 19975

Inquiry Number: 5658753.2s
May 21, 2019

The EDR Radius Map™ Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

ZION CHURCH ROAD
SELBYVILLE, DE 19975

COORDINATES

Latitude (North):	38.4777480 - 38° 28' 39.89''
Longitude (West):	75.1529160 - 75° 9' 10.49''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	486661.6
UTM Y (Meters):	4258628.5
Elevation:	15 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	6051100 SELBYVILLE, DE
Version Date:	2014

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20150801
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
ZION CHURCH ROAD
SELBYVILLE, DE 19975

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	HITCHENS PIT	RD 390 A	SEMS-ARCHIVE, SHWS	Lower	896, 0.170, South

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

EXECUTIVE SUMMARY

State and tribal landfill and/or solid waste disposal site lists

SWF/LF---------- Solid Waste Facilities

State and tribal leaking storage tank lists

LUST---------- Leaking Underground Storage Tank Project Listing
LAST---------- Leaking Aboveground Storage Tank Sites
INDIAN LUST---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST---------- Underground Storage Tank Listing
UST---------- Underground Storage Tank Database
AST---------- Aboveground Storage Tank Sites
INDIAN UST---------- Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

INST CONTROL---------- All Sites with Deed Restrictions

State and tribal voluntary cleanup sites

VCP---------- Voluntary Cleanup Program Sites
INDIAN VCP---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS---------- Certified Brownfields

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY---------- Recyclers Directory
INDIAN ODI---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI---------- Open Dump Inventory
IHS OPEN DUMPS---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL---------- Delisted National Clandestine Laboratory Register
US CDL---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2---------- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS---------- Hazardous Materials Information Reporting System

SPILLS---------- Environmental Release Notification System

Other Ascertainable Records

RCRA NonGen / NLR---------- RCRA - Non Generators / No Longer Regulated
FUDS---------- Formerly Used Defense Sites
DOD---------- Department of Defense Sites
SCRD DRYCLEANERS---------- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR---------- Financial Assurance Information
EPA WATCH LIST---------- EPA WATCH LIST
2020 COR ACTION---------- 2020 Corrective Action Program List
TSCA---------- Toxic Substances Control Act
TRIS---------- Toxic Chemical Release Inventory System
SSTS---------- Section 7 Tracking Systems
ROD---------- Records Of Decision
RMP---------- Risk Management Plans
RAATS---------- RCRA Administrative Action Tracking System
PRP---------- Potentially Responsible Parties
PADS---------- PCB Activity Database System
ICIS---------- Integrated Compliance Information System
FTTS---------- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS---------- Material Licensing Tracking System
COAL ASH DOE---------- Steam-Electric Plant Operation Data
COAL ASH EPA---------- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER---------- PCB Transformer Registration Database
RADINFO---------- Radiation Information Database
HIST FTTS---------- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS---------- Incident and Accident Data
CONSENT---------- Superfund (CERCLA) Consent Decrees
INDIAN RESERV---------- Indian Reservations
FUSRAP---------- Formerly Utilized Sites Remedial Action Program
UMTRA---------- Uranium Mill Tailings Sites
LEAD SMELTERS---------- Lead Smelter Sites
US AIRS---------- Aerometric Information Retrieval System Facility Subsystem
US MINES---------- Mines Master Index File
ABANDONED MINES---------- Abandoned Mines
FINDS---------- Facility Index System/Facility Registry System
UXO---------- Unexploded Ordnance Sites
ECHO---------- Enforcement & Compliance History Information
DOCKET HWC---------- Hazardous Waste Compliance Docket Listing
FUELS PROGRAM---------- EPA Fuels Program Registered Listing
AIRS---------- Air Emissions Listing
DRYCLEANERS---------- Drycleaner Facility Listing
ENF---------- Notice of Violations
Financial Assurance---------- Financial Assurance Information Listing
NPDES---------- Wastewater Permit Listing
TIER 2---------- Tier 2 Facility Listing
UIC---------- Underground Injection Wells Inventory Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP---------- EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Hist Auto---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner---------- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS---------- Recovered Government Archive State Hazardous Waste Facilities List
RGA LF---------- Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 03/11/2019 has revealed that there is 1 SEMS-ARCHIVE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
HITCHENS PIT Site ID: 0303899 EPA Id: DED984066886	***RD 390 A***	***S 1/8 - 1/4 (0.170 mi.)***	***1***	***8***

State- and tribal - equivalent CERCLIS

SHWS: Hazardous Substance Release Sites.

A review of the SHWS list, as provided by EDR, and dated 02/11/2019 has revealed that there is 1 SHWS site within approximately 1 mile of the target property.

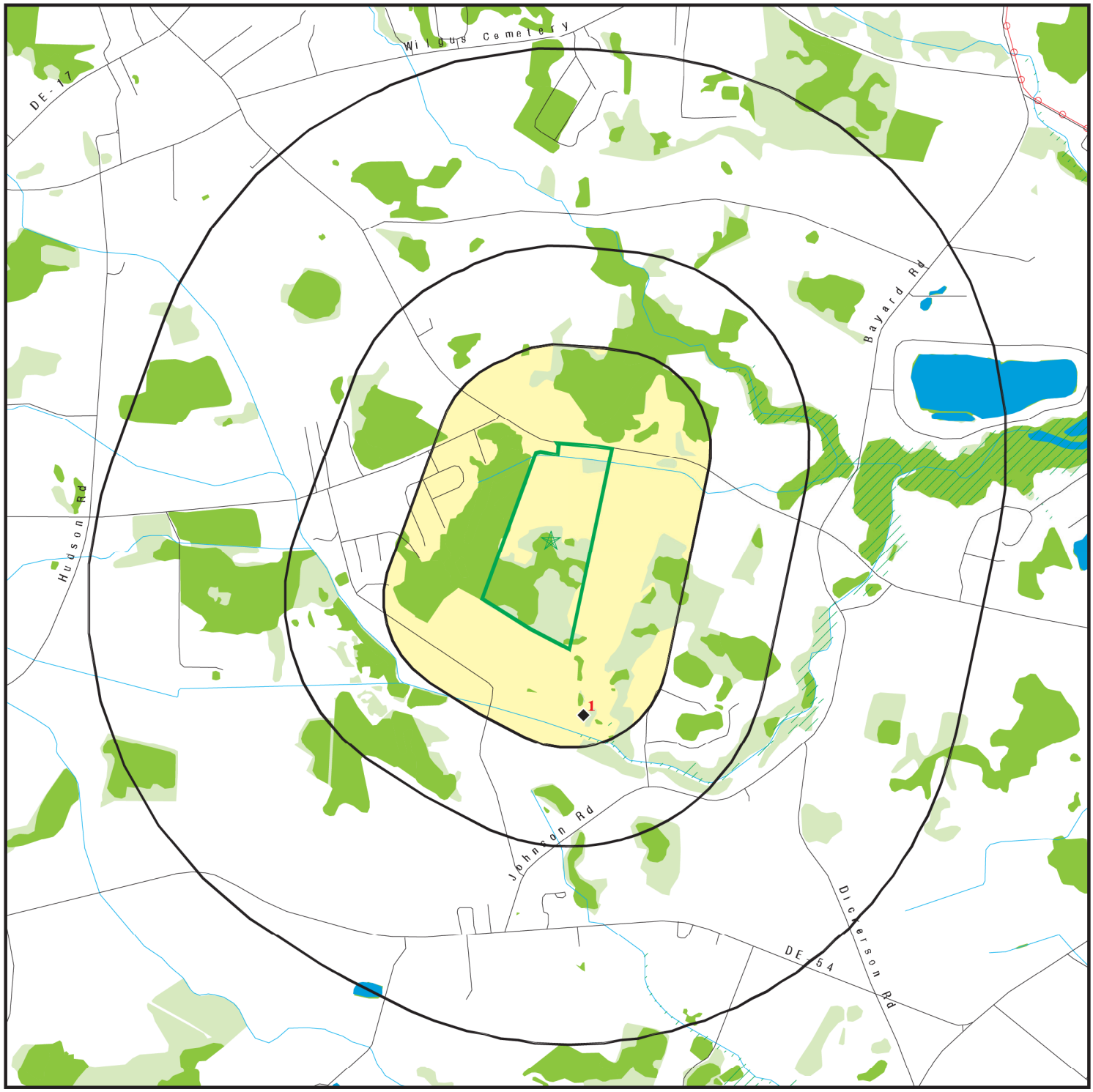
Lower Elevation	Address	Direction / Distance	Map ID	Page
HITCHENS PIT	***RD 390 A***	***S 1/8 - 1/4 (0.170 mi.)***	***1***	***8***
Facility Id: 10056272				
Prog ID: DE-0240				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 2 records.

Site Name	Database(s)
SAVAGE RESIDENCE	LUST
TWIN CEDARS - ZION CHURCH RD, FRAN	FINDS

OVERVIEW MAP - 5658753.2S

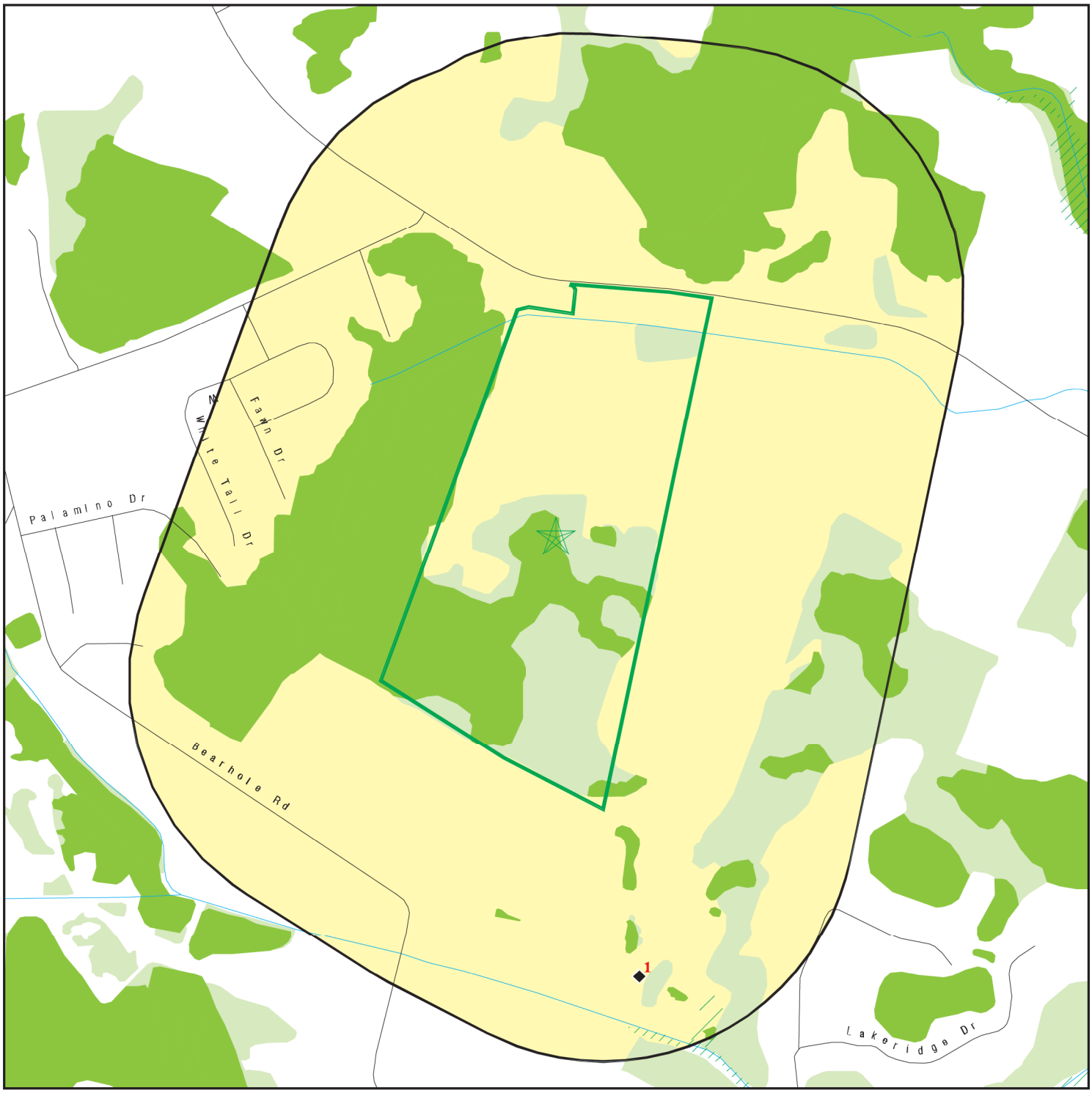


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Twin Cedars	CLIENT:	Geo-Technology Associates Inc.
ADDRESS:	Zion Church Road Selbyville DE 19975	CONTACT:	Kaelyn Thornton
		INQUIRY #:	5658753.2s
LAT/LONG:	38.477748 / 75.152916	DATE:	May 21, 2019 11:17 am

DETAIL MAP - 5658753.2S



0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Twin Cedars ADDRESS: Zion Church Road Selbyville DE 19975 LAT/LONG: 38.477748 / 75.152916	CLIENT: Geo-Technology Associates Inc. CONTACT: Kaelyn Thornton INQUIRY #: 5658753.2s DATE: May 21, 2019 11:18 am

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	1	0	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	1	0	0	NR	1
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0
LAST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
TIER 2	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	TP		NR	NR	NR	NR	NR	0
RGA LF	TP		NR	NR	NR	NR	NR	0
- Totals --		0	0	2	0	0	0	2

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
South
1/8-1/4
0.170 mi.
896 ft.

HITCHENS PIT
RD 390 A
BUNTING, DE 19975

SEMS-ARCHIVE **1003866740**
SHWS **DED984066886**

Relative:
Lower

Actual:
13 ft.

SEMS Archive:

Site ID:	0303899
EPA ID:	DED984066886
Cong District:	01
FIPS Code:	10005
FF:	N
NPL:	Not on the NPL
Non NPL Status:	NFRAP-Site does not qualify for the NPL based on existing information

SEMS Archive Detail:

Region:	03
Site ID:	0303899
EPA ID:	DED984066886
Site Name:	HITCHENS PIT
NPL:	N
FF:	N
OU:	00
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1
Start Date:	Not reported
Finish Date:	1990-05-31 04:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf In-Hse

Region:	03
Site ID:	0303899
EPA ID:	DED984066886
Site Name:	HITCHENS PIT
NPL:	N
FF:	N
OU:	00
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1990-04-03 04:00:00
Finish Date:	1990-04-03 04:00:00
Qual:	Not reported
Current Action Lead:	St Perf

Region:	03
Site ID:	0303899
EPA ID:	DED984066886
Site Name:	HITCHENS PIT
NPL:	N
FF:	N
OU:	00
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	Not reported
Finish Date:	1990-05-31 04:00:00
Qual:	N
Current Action Lead:	St Perf

HITCHENS PIT (Continued) **1003866740**

SHWS:

Facility ID:	10056272
Site Type:	Debris Disposal Area
Care Of:	Not reported
PI ID:	27067
Prog ID:	DE-0240
Additional Info:	HSCA
Reference Pt:	Facility/Interest Center
Horizontal Method:	Photo Interpolation-2002 Orthophoto
Loc Type:	P
XCoordinate NAD83 Meters:	223240.16
YCoordinate NAD83 Meters:	52335.53
Latitude Dec:	38.471389
Longitude Dec:	-75.15139
Latitude Degrees:	38
Latitude Minutes:	28
Latitude Seconds:	17.0004
Longitude Degrees:	-75
Longitude Minutes:	9
Longitude Seconds:	5.004
PO Name:	Selbyville
Tax ID:	Not reported
Sewer District:	Not reported
Floodplain Zone Code:	Not reported
Flood Plain Zone:	Not reported
Basin:	Inland Bays/Atlantic Ocean
Watershed:	Little Assawoman
DRBC_Basin:	N
Quad:	SELBYVILLE
Senate District:	20
Senator:	Senator Gerald W. Hocker
House District:	38
Representative:	Representative Ronald E. Gray
School District:	Milford
GMZ Name:	Not reported
AG Pres District:	Not reported
Water District:	Not reported
Mod Grid:	202-052

Facility ID:	10056272
Site Type:	Debris Disposal Area
Care Of:	Not reported
PI ID:	27067
Prog ID:	DE-0240
Additional Info:	Pre Remedial (PA/SI)
Reference Pt:	Facility/Interest Center
Horizontal Method:	Photo Interpolation-2002 Orthophoto
Loc Type:	P
XCoordinate NAD83 Meters:	223240.16
YCoordinate NAD83 Meters:	52335.53
Latitude Dec:	38.471389
Longitude Dec:	-75.15139
Latitude Degrees:	38
Latitude Minutes:	28
Latitude Seconds:	17.0004
Longitude Degrees:	-75
Longitude Minutes:	9

HITCHENS PIT (Continued) **1003866740**

Longitude Seconds:	5.004
PO Name:	Selbyville
Tax ID:	Not reported
Sewer District:	Not reported
Floodplain Zone Code:	Not reported
Flood Plain Zone:	Not reported
Basin:	Inland Bays/Atlantic Ocean
Watershed:	Little Assawoman
DRBC_Basin:	N
Quad:	SELBYVILLE
Senate District:	20
Senator:	Senator Gerald W. Hocker
House District:	38
Representative:	Representative Ronald E. Gray
School District:	Milford
GMZ Name:	Not reported
AG Pres District:	Not reported
Water District:	Not reported
Mod Grid:	202-052

Count: 2 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
FRANKFORD	S122881183	SAVAGE RESIDENCE	37024 JOHNSON ROAD	19945	LUST
SUSSEX COUNTY	1015890394	TWIN CEDARS - ZION CHURCH RD, FRAN	ZION CHURCH ROAD		FINDS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/05/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 34

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 34

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/22/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 41

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/10/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/31/2019
Date Data Arrived at EDR: 02/04/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/31/2019
Date Data Arrived at EDR: 02/04/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/04/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/26/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 36

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/26/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: Hazardous Substance Release Sites

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 02/11/2019
Date Data Arrived at EDR: 02/12/2019
Date Made Active in Reports: 04/10/2019
Number of Days to Update: 57

Source: Department of Natural Resources and Environmental Control
Telephone: 302-395-2600
Last EDR Contact: 05/17/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/02/2019
Date Data Arrived at EDR: 01/02/2019
Date Made Active in Reports: 02/14/2019
Number of Days to Update: 43

Source: Department of Natural Resources and Environmental Control
Telephone: 302-739-3820
Last EDR Contact: 04/02/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LAST: Leaking Aboveground Storage Tank Sites

Leaking aboveground storage tank site locations.

Date of Government Version: 04/15/2019
Date Data Arrived at EDR: 04/16/2019
Date Made Active in Reports: 04/18/2019
Number of Days to Update: 2

Source: Department of Natural Resources & Control
Telephone: 302-395-2500
Last EDR Contact: 04/16/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

LUST: Leaking Underground Storage Tank Project Listing

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 01/14/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 02/14/2019
Number of Days to Update: 30

Source: Department of Natural Resources and Environmental Control
Telephone: 302-395-2500
Last EDR Contact: 04/16/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/12/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 03/12/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 50

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 03/08/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/13/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/25/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Varies

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/14/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 02/15/2019
Number of Days to Update: 31

Source: Department of Natural Resources and Environmental Control
Telephone: 302-395-2500
Last EDR Contact: 04/16/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

AST: Aboveground Storage Tank Sites
Facilities with aboveground storage tanks.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 04/18/2019
Number of Days to Update: 16

Source: Department of Natural Resources and Environmental Control
Telephone: 302-739-4764
Last EDR Contact: 04/02/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 03/08/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 54

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/17/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 11/07/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 11/01/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/12/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/03/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 03/12/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 50

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

State and tribal institutional control / engineering control registries

Inst Control: All Sites with Deed Restrictions

Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/11/2019
Date Data Arrived at EDR: 02/12/2019
Date Made Active in Reports: 04/10/2019
Number of Days to Update: 57

Source: Department of Natural Resources & Environmental Control
Telephone: 302-395-2600
Last EDR Contact: 05/17/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Sites

When a property is contaminated with hazardous substances there are liabilities associated with the cleanup of the site under Federal and State Superfund laws, regardless of who caused the contamination and when it was caused. Because of this liability, old industrial sites (with contamination) located close to well developed infrastructure do not attract developers or buyers. These individuals prefer to purchase pristine property without contamination known as "greenfield." Under the Voluntary Cleanup Program (VCP) developers and buyers performing the cleanup of contaminated properties would be provided the much needed protection from potential liabilities for past contamination. Thus, they can proceed with the purchase or development of the property with the assurance that they will not be held liable for environmental problems that were a result of past practices at the site.

Date of Government Version: 02/11/2019
Date Data Arrived at EDR: 02/12/2019
Date Made Active in Reports: 04/10/2019
Number of Days to Update: 57

Source: Department of Natural Resources & Environmental Control
Telephone: 302-395-2600
Last EDR Contact: 05/17/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Annually

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/25/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Certified Brownfields

Sites that have requested brownfields certification from the Secretary of DNREC.

Date of Government Version: 10/30/2018
Date Data Arrived at EDR: 02/07/2019
Date Made Active in Reports: 04/10/2019
Number of Days to Update: 62

Source: Dept. of Natural Resources & Environmental Control
Telephone: 302-739-4764
Last EDR Contact: 05/06/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/17/2018
Date Data Arrived at EDR: 12/18/2018
Date Made Active in Reports: 01/11/2019
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/19/2019
Next Scheduled EDR Contact: 07/01/2019
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: Recyclers Directory

A listing of recycling facilities.

Date of Government Version: 03/21/2019
Date Data Arrived at EDR: 03/22/2019
Date Made Active in Reports: 04/10/2019
Number of Days to Update: 19

Source: Delaware Econonmic Development Office
Telephone: 302-739-4271
Last EDR Contact: 03/22/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/23/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/24/2019
Date Data Arrived at EDR: 02/26/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 50

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/24/2019
Date Data Arrived at EDR: 02/26/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 50

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/26/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 49

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/26/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

SPILLS: Environmental Release Notification System

The Department of Natural Resources and Environmental Control (DNREC) developed this system to allow Delawareans to learn promptly of releases or discharges of contaminants or pollutants that meet or exceed certain thresholds in their neighborhoods or throughout the state.

Date of Government Version: 01/22/2019
Date Data Arrived at EDR: 01/23/2019
Date Made Active in Reports: 02/15/2019
Number of Days to Update: 23

Source: Department of Natural Resources & Environmental Control
Telephone: 302-739-9902
Last EDR Contact: 04/09/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Semi-Annually

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/27/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 04/03/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/12/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/12/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/13/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/25/2019
Date Data Arrived at EDR: 03/26/2019
Date Made Active in Reports: 05/07/2019
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/26/2019
Next Scheduled EDR Contact: 07/08/2019
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/06/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/10/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/22/2019
Next Scheduled EDR Contact: 07/01/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/20/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/24/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 18

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2019
Date Data Arrived at EDR: 02/14/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 03/11/2019
Date Data Arrived at EDR: 03/14/2019
Date Made Active in Reports: 04/17/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/10/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/10/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 04/08/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/07/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/05/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 04/26/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/02/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 42
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/02/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 01/29/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 51

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/30/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 02/11/2019
Date Made Active in Reports: 03/21/2019
Number of Days to Update: 38

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/05/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/13/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/11/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 05/02/2019
Next Scheduled EDR Contact: 08/19/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/22/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 04/18/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/18/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/27/2018
Date Data Arrived at EDR: 02/27/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 33

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/27/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/01/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/01/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/27/2019
Date Data Arrived at EDR: 03/28/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 34

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/21/2019
Next Scheduled EDR Contact: 06/24/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/15/2019
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 03/15/2019
Number of Days to Update: 10

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 03/05/2019
Next Scheduled EDR Contact: 06/17/2019
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 03/01/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/15/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 03/03/2019
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/09/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 02/21/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 39

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/21/2019
Next Scheduled EDR Contact: 06/03/2019
Data Release Frequency: Quarterly

AIRS: Air Emissions Listing

A listing of facilities with air emissions.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 04/18/2019
Number of Days to Update: 16

Source: Department of Natural Resources & Environmental Control
Telephone: 302-323-4542
Last EDR Contact: 04/02/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

DRYCLEANERS: DRYCLEANERS

A listing of drycleaner facility locations.

Date of Government Version: 01/18/2019
Date Data Arrived at EDR: 01/24/2019
Date Made Active in Reports: 02/14/2019
Number of Days to Update: 21

Source: Department of Natural Resources & Environmental Control
Telephone: 302-739-9400
Last EDR Contact: 02/26/2019
Next Scheduled EDR Contact: 06/10/2019
Data Release Frequency: Varies

ENFORCEMENT: Notice of Violations

Notice of violations are based on the observations of, and information submitted to, DNREC personnel. They only represent preliminary findings of the Department and are subject to further technical and legal review. These notices may or may not result in an enforcement action. Divisions included are Water Resources Air & Waste Management

Date of Government Version: 01/22/2019
Date Data Arrived at EDR: 01/24/2019
Date Made Active in Reports: 02/14/2019
Number of Days to Update: 21

Source: Department of Natural Recourses & Conservation
Telephone: 302-738-9401
Last EDR Contact: 04/25/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Semi-Annually

Financial Assurance 1: Financial Assurance Information Listing

Financial assurance information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay

Date of Government Version: 01/10/2018
Date Data Arrived at EDR: 01/11/2018
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 5

Source: Department of Natural Resources & Environmental Control
Telephone: 302-739-9403
Last EDR Contact: 04/05/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
Financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay

Date of Government Version: 01/10/2018
Date Data Arrived at EDR: 01/11/2018
Date Made Active in Reports: 02/21/2018
Number of Days to Update: 41

Source: Department of Natural Resources & Environmental Control
Telephone: 302-739-9403
Last EDR Contact: 04/05/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Varies

Financial Assurance 3: Financial Assurance Information Listing
Underground storage tank financial assurance information.

Date of Government Version: 01/14/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 02/15/2019
Number of Days to Update: 31

Source: Department of Natural Resources & Environmental Control
Telephone: 302-395-2500
Last EDR Contact: 04/16/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Quarterly

NPDES: Wasterwater Permit Listing
A listing of wastewater permits.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/02/2019
Date Made Active in Reports: 04/18/2019
Number of Days to Update: 16

Source: Department of Natural Resources & Environmental Control
Telephone: 302-739-9946
Last EDR Contact: 04/02/2019
Next Scheduled EDR Contact: 07/15/2019
Data Release Frequency: Quarterly

TIER 2: Tier 2 Facility Listing
A listing of facilities which store or manufacture hazardous materials that submit a chemical inventory report.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 01/19/2018
Number of Days to Update: 53

Source: Department of Natural Resources & Environmental Control
Telephone: 302-739-9405
Last EDR Contact: 04/25/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Annually

UIC: Underground Injection Wells Inventory Listing
A listing of underground injection well locations.

Date of Government Version: 01/16/2019
Date Data Arrived at EDR: 01/25/2019
Date Made Active in Reports: 02/15/2019
Number of Days to Update: 21

Source: DNREC
Telephone: 302-739-9948
Last EDR Contact: 04/22/2019
Next Scheduled EDR Contact: 08/05/2019
Data Release Frequency: Semi-Annually

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Deparment of Natural Resources and Environmental Control in Delaware.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Natural Resources and Environmental Control
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Deparment of Natural Resources and Environmental Control in Delaware.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 200

Source: Department of Natural Resources and Environmental Control
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 02/11/2019
Date Data Arrived at EDR: 02/12/2019
Date Made Active in Reports: 03/04/2019
Number of Days to Update: 20

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/14/2019
Next Scheduled EDR Contact: 08/26/2019
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/10/2019
Next Scheduled EDR Contact: 07/22/2019
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/30/2019
Date Made Active in Reports: 02/14/2019
Number of Days to Update: 15

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/01/2019
Next Scheduled EDR Contact: 08/12/2019
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 10/23/2018
Date Made Active in Reports: 11/27/2018
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/15/2019
Next Scheduled EDR Contact: 07/29/2019
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/17/2019
Next Scheduled EDR Contact: 09/02/2019
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/15/2018
Date Made Active in Reports: 07/09/2018
Number of Days to Update: 24

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/11/2019
Next Scheduled EDR Contact: 06/24/2019
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Electric Power Transmission Line Data
Source: PennWell Corporation
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Facility List
Source: Department of Services for Children
Telephone: 302-633-2500

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Statewide Wetlands Mapping Project
Source: Dept. of Natural Resources & Environmental Conservation
Telephone: 302-739-4691

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

Appendix 9 – Traffic Analysis

Service Level Evaluation, DelDOT, November 13, 2019

TIS Approval Letter – Twin Cedars, DelDOT, July 13, 2020

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

November 13, 2019

Ms. Janelle Cornwell, Director
Sussex County Planning & Zoning
P.O. Box 417
Georgetown, DE 19947

Dear Ms. Cornwell:

The Department has completed its review of a Service Level Evaluation Request for the **Bay Developers, LLC (Mr. Henry Mast)** rezoning application, which we received on October 17, 2019. This application is for an approximately 64.22-acre parcel (Tax Parcel: 533-11.00-42.00). The subject land is located on the south side Zion Church Road (Sussex Road 382), approximately 800 feet east of the intersection of Zion Church Road (Sussex Road 382) and Deer Run Road (Sussex Road 388). The subject land is currently split-zoned as CR-1 (Commercial Residential) and GR (General Residential), and the applicant is seeking a residential planned community (RPC) overlay approval for the GR portion to develop 44 single-family detached houses, 44 townhouses, and 168 apartment units.

Per the 2018 Delaware Vehicle Volume Summary, the annual average and summer average daily traffic volumes along the segment of Zion Church Road where the subject land is located, which is from Bayard Road (Sussex Road 384) to Frankford School Road (Sussex Road 92), are 5,305 and 6,628 vehicles per day, respectively.

Based on our review, we estimate that the proposed land use would generate more than 50 vehicle trips in any hour or 500 vehicle trips per day, and would be considered to have a Major impact to the local area roadways. In this instance, the Department considers a Major impact to be when a proposed land use would generate more than 200 vehicle trips in any hour of the week and / or 2,000 vehicle trips per day. According to the Institute of Transportation Engineers (ITE) Trip Generation Manual, the proposed development would generate 2,051 vehicle trips per day, 133 vehicle trips during the morning peak hour, and 161 vehicle trips during the afternoon peak hour. Because of this impact, we recommend that the applicant be required to perform a Traffic Impact Study (TIS) for the subject application.

DelDOT

If the County approves this application, the applicant should be reminded that DelDOT requires compliance with State regulations regarding plan approvals and entrance permits, whether or not a TIS is required.

Please contact Mr. Claudy Joinville, at (302) 760-2124, if you have questions concerning this correspondence.

Sincerely,

T. William Brockenbrough, Jr.
County Coordinator
Development Coordination

TWB:cjm
cc: Constance C. Holland, Coordinator, Cabinet Committee on State Planning Issues
Bay Developers, LLC (Mr. Henry Mast), Applicant
J. Marc Coté, Assistant Director, Development Coordination
Gemez Norwood, South District Public Works Manager, Maintenance and Operations
Susanne Laws, Sussex County Subdivision Coordinator, Development Coordination
Derek Sapp, Subdivision Manager, Development Coordination
Kevin Hickman, Subdivision Manager, Development Coordination
Brian Yates, Subdivision Manager, Development Coordination
John Andrescavage, Subdivision Manager, Development Coordination
Troy Brestel, Project Engineer, Development Coordination
Claudy Joinville, Project Engineer, Development Coordination

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

July 13, 2020

Mr. Joe Caloggero
The Traffic Group, Inc.
9900 Franklin Square Drive
Suite H
Baltimore, MD 21236

Dear Mr. Caloggero:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Twin Cedars** (Protocol Tax Parcel 533-11.00-42.00) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel
Project Engineer

TEB:km
Enclosures
cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Jamie Whitehouse, Sussex County Planning and Zoning
Mr. Andrew Parker, McCormick Taylor, Inc.
Mr. Kevin Hickman, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Brad Eaby, Deputy Attorney General
J. Marc Coté, Director, Planning
Shanté Hastings, Director, Transportation Solutions (DOTS)
Mark Luszcz, Deputy Director, DOTS
Michael Simmons, Assistant Director, Project Development South, DOTS
Todd Sammons, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Chris Sylvester, Traffic Studies Manager, Traffic, DOTS
Alistair Probert, South District Engineer, South District
Gemez Norwood, South District Public Works Supervisor, South District
Jared Kaufmann, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Susanne Laws, Sussex Review Coordinator, Development Coordination
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
James Argo, Sussex Plan Reviewer, South District
Mark Galipo, Traffic Engineer, Traffic, DOTS
Claudy Joinville, Project Engineer, Development Coordination

McCORMICK TAYLOR

July 10, 2020

Mr. Troy E. Brestel
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1946F
Traffic Impact Study Services
Task No. 1A Subtask 01A – Twin Cedars

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Twin Cedars residential development prepared by The Traffic Group, Inc. dated March 9, 2020. The Traffic Group prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Twin Cedars residential development, proposed to be located along Delaware Route 20 (Zion Church Road / Sussex Road 382) between Deer Run Road (Sussex Road 388) and Bayard Road (Sussex Road 384) / Johnson Road (Sussex Road 382A) in Sussex County, Delaware. The proposed development would consist of 44 single-family detached houses, 44 townhouses, and 168 apartments. One full-access driveway is proposed on Delaware Route 20. Construction is expected to be complete by 2026.

The subject land is located on an approximately 64.22-acre parcel. The land is currently split zoned as C-1 (General Commercial) and GR (General Residential), and the developer is seeking a residential planned community (RPC) overlay for the GR portion in Sussex County.

Currently, there is one active DelDOT project within the study area. The project involves planned improvements at the intersection of Delaware Route 20 and Bayard Road/Johnson Road. In late 2018 and early 2019, DelDOT's Traffic Studies Section conducted a traffic study and solicited public input to evaluate possible safety improvements at this unsignalized two-way stop-controlled intersection. Through this process, DelDOT determined that a traffic signal is recommended for this intersection. This recommendation and the associated documentation has been sent to DelDOT's Traffic Design Section to start programming the design work. The construction date is to be determined.

Based on our review, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	*Existing Traffic Control*	*Situations for which deficiencies occur*
Delaware 20 and Bayard Road / Johnson Road	Unsignalized	2019 Existing summer Saturday (Case 1); 2026 without Twin Cedars summer Saturday (Case 2); 2026 with Twin Cedars summer Saturday (Case 3)

Delaware Route 20 and Bayard Road / Johnson Road

This unsignalized intersection experiences LOS deficiencies in the Saturday midday peak hour for 2019 existing conditions, 2026 conditions without Twin Cedars, and 2026 conditions with Twin Cedars. DelDOT has evaluated various improvement options for this intersection and determined that a traffic signal is recommended; to this end, the developer should make an equitable share contribution toward the installation of a traffic signal, as described below in Item No. 2.

Should the County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should construct the full-movement site access on Delaware Route 20. The proposed configuration is shown in the table below. This proposed site driveway should be constructed directly across from the existing Bayside Mini Storage driveway.

Approach	Existing Configuration	Proposed Configuration
Eastbound Delaware Route 20	One shared left-turn/through lane	One left-turn lane, one through lane, and one right-turn lane
Westbound Delaware Route 20	One shared through/right-turn lane	One left-turn lane and one shared through/right-turn lane
Northbound Site Access	Approach does not exist	One shared left-turn/through lane and one right-turn lane
Southbound Bayside Mini Storage driveway	One shared left/right-turn lane	One shared left/through/right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Delaware Route 20	50 feet *	290 feet **
Westbound Delaware Route 20	210 feet **	N/A
Northbound Site Access	N/A	50 feet ***
Southbound Bayside Mini Storage driveway	N/A	N/A

* Turn lane is not warranted per DelDOT's *Auxiliary Lane Worksheet,* but is recommended for safety to shadow the required westbound left-turn lane.
** Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*.
*** Initial turn-lane length based on storage length per queuing analysis, with 50-foot minimum

2. The developer should coordinate with DelDOT regarding an equitable share contribution toward a DelDOT project to install a traffic signal at the intersection of Delaware Route 20 and Bayard Road / Johnson Road. The amount of the contribution should be determined through coordination with DelDOT's Development Coordination Section. At least one other developer is required to contribute to this improvement as well.

3. The following bicycle and pedestrian improvements should be included:

   a. Adjacent to the proposed right-turn lane on eastbound Delaware Route 20 at the proposed site entrance, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel

   b. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.

   c. Utility covers should be made flush with the pavement.

   d. If clubhouses or other community facilities are constructed as shown on the site plan, bicycle parking should be provided near building entrances. Where building architecture provides for an awning, other overhang, or indoor parking, the bicycle parking should be covered.

   e. A minimum 15-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Delaware Route 20.

f. Within the easement along the Delaware Route 20 site frontage, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed. The shared-use path should meet AASHTO and ADA standards and should have a minimum of a five-foot buffer from the roadway. At the property boundaries, the shared-use path should connect to the adjacent property or to the shoulder in accordance with DelDOT's *Shared-Use Path and/or Sidewalk Termination Reference Guide* dated August 1, 2018. The developer should coordinate with DelDOT's Development Coordination Section to determine the details of the shared-use path connections at the property boundaries.

g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.

h. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. Internal sidewalks in the development should connect to the proposed shared-use path along Delaware Route 20.

i. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's site plan review process.

Additional details on our review of this TIS are attached. Please contact me at (610) 640-3500 or through e-mail at ajparker@mccormicktaylor.com if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.

Andrew J. Parker, PE, PTOE
Project Manager

Enclosure

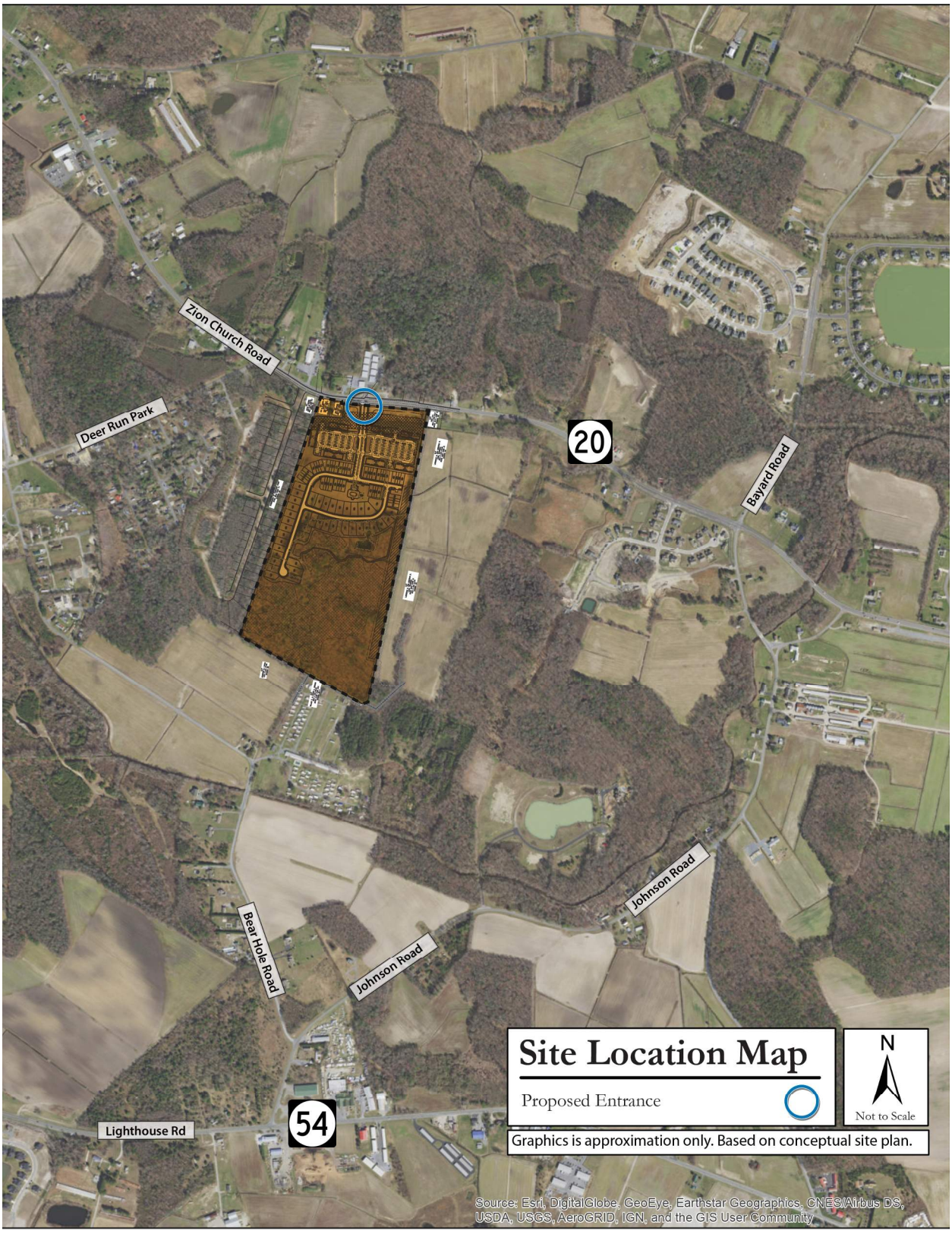
General Information

Report date: March 9, 2020
Prepared by: The Traffic Group, Inc.
Prepared for: Bay Developers, LLC
Tax parcel: 533-11.00-42.00
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Twin Cedars development consists of 44 single-family detached houses, 44 townhouses, and 168 apartments.
Location: The site is located along Delaware Route 20 (Zion Church Road / Sussex Road 382) between Deer Run Road (Sussex Road 388) and Bayard Road (Sussex Road 384) / Johnson Road (Sussex Road 382A) in unincorporated Sussex County. A site location map is included on page 6.
Amount of land to be developed: approximately 64.22 acre parcel
Land use approval(s) needed: Subdivision approval. The land is currently split zoned as C-1 (General Commercial) and GR (General Residential), and the developer is seeking a residential planned community (RPC) overlay for the GR portion in Sussex County.
Proposed completion year: 2026
Proposed access locations: One full-access driveway is proposed on Delaware Route 20.
Daily Traffic Volumes (per DelDOT Traffic Summary 2019):

- 2019 Average Annual Daily Traffic on Delaware Route 20: 6,635 vehicles/day


Zion Church Road
Deer Run Park
20
Bayard Road
Johnson Road
Bear Hole Road
Johnson Road
Lighthouse Rd
54
Site Location Map
Proposed Entrance
N
Not to Scale
Graphics is approximation only. Based on conceptual site plan.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2015 Delaware Strategies for State Policies and Spending

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed Twin Cedars residential development is located within Investment Level 3.

Investment Level 3
Investment Level 3 reflects areas where growth is anticipated by local, county, and state plans in the longer-term future. Investment Level 3 areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities, but where development is not necessary to accommodate expected short-term population growth. The second category includes lands that are adjacent to fast-growing Investment Level 1 and 2 areas but are often impacted by environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state Agencies and local governments with land-use authority.

Generally, Investment Level 3 areas should not be developed until surrounding Investment Level 1 and 2 areas are substantially built out. From a housing perspective, Investment Level 3 areas are characterized by low density and rural homes. New housing developments in the short term would, in most cases, represent leap-frog development, which is undesirable. Higher density housing in Investment Level 3 areas is more appropriate once Level 2 areas are built out and utilities are available.

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed Twin Cedars residential development includes 44 single-family detached houses, 44 townhouses, and 168 apartments located within an Investment Level 3 area. Investment Level 3 reflects areas where growth is anticipated by the county in the long-term. Given that the location is in a Growth Area as defined by Sussex County and that the anticipated opening date for this development is three years out, the proposed development generally appears to comply with the guidelines of Investment Level 3 areas as described in the 2015 "Strategies for State Policies and Spending."

Comprehensive Plan

Sussex County Comprehensive Plan:
(Source: Sussex County Comprehensive Plan, March 2019)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development parcel is within a Coastal Area (categorized as a Growth Area).

Growth Areas, including the Coastal Area, are designed to accommodate concentrated levels of development. Sussex County has designated the areas around Rehoboth Bay, Indian River Bay, and Little Assawoman Bay (the inland bays) as Coastal Areas. Coastal Areas generally encompass areas on the south-eastern side of Sussex County within what was previously referred to as the Environmentally Sensitive Developing Areas of prior Comprehensive Plans. The updated name more accurately reflects the function of this land use classification. While the Coastal Area is a

Growth Area, additional considerations should be taken into account in this Area that may not apply in other Growth Areas.

The Coastal Area designation is intended to recognize two characteristics. First, this region is among the most desirable locations in Sussex County for new housing, as is reflected in new construction data and real estate prices. Second, this region contains ecologically important and sensitive characteristics as well as other coastal lands which help to absorb floodwaters and provide extensive habitat for native flora and fauna. This area also has significant impact upon water quality within the adjacent bays and inlets as well as upon natural the region's various habitats. And, these factors are themselves part of the reason that this Area is so desirable-making the protection of them important to both the environment and the economy.

The County has significant initiatives to extend public sewer service to replace inadequate on-site systems. Careful control of stormwater runoff is also an important concern in keeping sediment and other pollutants out of the Inland Bays.

The challenge in this region is to safeguard genuine natural areas and mitigate roadway congestion without stifling the tourism and real estate markets which: a) provide many jobs; b) create business for local entrepreneurs; and c) help keep local tax rates low.

The following guidelines should apply to future growth in Coastal Areas:

Permitted Uses – Coastal Areas are areas that can accommodate development provided special environmental concerns are addressed. A range of housing types should be permitted in Coastal Areas, including single-family homes, townhouses, and multi-family units. Retail and office uses are appropriate but larger shopping centers and office parks should be confined to selected locations with access along arterial roads. Appropriate mixed-use development should also be allowed. In doing so, careful mixtures of homes with light commercial, office and institutional uses can be appropriate to provide for convenient services and to allow people to work close to home. Major new industrial uses are not proposed in these areas.

Densities – Sussex County's base density of 2 units per acre is appropriate throughout this classification; however, medium and higher density (4-12 units per acre) can be appropriate in certain locations. Medium and higher density could be supported in areas: where there is central water and sewer; near sufficient commercial uses and employment centers; where it is in keeping with the character of the area; where it is along a main road or at/or near a major intersection; where there is adequate Level of Service; or where other considerations exist that are relevant to the requested project and density. A clustering option permitting smaller lots and additional flexibility in dimensional standards is encouraged on tracts of a certain minimum size, provided significant permanent common open space is preserved and the development is connected to central water and sewer service. The preservation of natural resources or open space is strongly encouraged in this land use classification. The County should revisit environmental protection in the Coastal Areas.

Specific regulations governing cluster developments are designated by zoning district. There currently is an option where density can be increased with optional density bonuses for certain

zoning districts. Those optional bonuses may involve payment of fees that fund permanent land preservation elsewhere in the County, or other options. RPC's are encouraged to allow for a mix of housing types and to preserve open space and natural areas/resources. Cluster development that allows for smaller lots and flexibility in dimensional standards is encouraged if the developer uses a cluster option that results in permanent preservation of a substantial percentage of the tract and/or natural areas/resources. Master planning should be encouraged especially for large-scale developments on large parcels or groups of parcels, higher density and mixed-use developments to provide flexibility in site design.

All applicants for developments of a minimum size (as specified in zoning) should continue to be required to provide information that analyzes the development's potential environmental impacts, including effects on stormwater runoff, nitrogen and phosphorous loading, wetlands, woodlands, wastewater treatment, water systems, and other matters that affect the ecological sensitivity of the inland bays.

Infrastructure – Central water and sewer facilities are strongly encouraged. If central utilities are not possible, permitted densities should be limited to two units per acre provided a septic permit can be approved.

Proposed Development's Compatibility with Comprehensive Plan: The proposed Twin Cedars residential development includes 44 single-family detached houses, 44 townhouses, and 168 apartments on a 64.22-acre parcel (a gross density of just under 4 units per acre). The land is currently split zoned as C-1 (General Commercial) and GR (General Residential), and the developer is seeking a residential planned community (RPC) overlay for the GR portion in Sussex County. The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development parcel is within the Coastal Area (categorized as a Growth Area). The proposed development appears to comply with the characteristics and *Permitted Uses* for the Coastal Area. However, due to the some small lot sizes and overall density greater than 2 units per acre, along with the potential RPC overlay, this development raises questions regarding consistency with Sussex County regulations; therefore additional discussion may be required.

Relevant Projects in the DelDOT Capital Transportation Program

Currently, there is one active DelDOT project within the study area. The project involves planned improvements at the intersection of Delaware Route 20 and Bayard Road/Johnson Road. In late 2018 and early 2019, DelDOT's Traffic Studies Section conducted a traffic study and solicited public input to evaluate possible safety improvements at this unsignalized two-way stop-controlled intersection. Through this process, DelDOT determined that a traffic signal is recommended for this intersection. This recommendation and the associated documentation has been sent to DelDOT's Traffic Design Section to start programming the design work. The construction date is to be determined.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Tenth Edition, published by the Institute of Transportation Engineers (ITE). The following land use was utilized to estimate the amount of new traffic generated for this development:

- 44 Single-Family Detached Homes (ITE Land Use Code 210)
- 44 Multi-Family Housing Units, Low-Rise (ITE Land Use Code 220)
- 168 Multi-Family Housing Units, Mid-Rise (ITE Land Use Code 221)

Table 1
TWIN CEDARS PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
44 Single-Family Detached	9	27	36	29	17	46	30	25	55
44 Multi-Family Housing, Low-Rise	5	17	22	18	10	28	8	6	14
168 Multi-Family Housing, Mid-Rise	15	42	57	45	28	73	38	39	77
TOTAL TRIPS	29	86	115	92	55	147	76	70	146

Overview of TIS

Intersections examined:

1) Delaware Route 20 & Site Access
2) Delaware Route 20 & Deer Run Road
3) Delaware Route 20 & Bayard Road / Johnson Road

Conditions examined:

1) 2019 existing (Case 1)
2) 2026 without Twin Cedars (Case 2)
3) 2026 with Twin Cedars (Case 3)

Peak hours evaluated: Weekday morning and evening and Saturday mid-day peak hours

Committed developments considered:

1) Orr Property (a.k.a. Miller Creek) (135 single-family detached houses)
2) Estuary (284 single-family detached houses)
3) Fox Haven I (76 single-family detached houses; 4 unbuilt)
4) Fox Haven II (99 single-family detached houses)

Intersection Descriptions

1) **Delaware Route 20 & Site Access**
   Type of Control: proposed one-way stop (T-intersection)
   Eastbound Approach: (Delaware Route 20) existing one through lane; proposed one through lane and one right-turn lane
   Westbound Approach: (Delaware Route 20) existing one through lane; proposed one left-turn lane and one through lane
   Northbound Approach: (Site Access) proposed one shared left-turn/right-turn lane, stop control

2) **Delaware Route 20 & Deer Run Road**
   Type of Control: unsignalized
   Eastbound Approach: (Delaware Route 20) one shared through/right-turn lane
   Westbound Approach: (Delaware Route 20) one left-turn/through lane
   Northbound Approach: (Deer Run Road) one shared left-turn/right-turn lane, stop control

3) **Delaware Route 20 & Bayard Road / Johnson Road**
   Type of Control: existing two-way stop; DelDOT traffic study proposes a traffic signal
   Eastbound Approach: (Delaware Route 20) one left-turn lane, one through lane, one bicycle lane, and one right-turn lane
   Westbound Approach: (Delaware Route 20) one shared left-turn/through/right-turn lane
   Northbound Approach: (Johnson Road) one shared left-turn/through/right-turn lane, stop control
   Southbound Approach: (Bayard Road) one shared left-turn/through/right-turn lane, stop control

Safety Evaluation

Crash Data: Per current DelDOT policy, review of crash data was not conducted at this time.

Sight Distance: The proposed site access on Delaware Route 20 is located between two horizontal curves, so sight distance is limited looking in either direction (especially to the left) from the proposed northbound driveway approach. As always adequacy of available sight distance should be confirmed during the site plan review process for all proposed movements at the site accesses.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) does not currently operate any fixed-route transit bus service in the area of the proposed Twin Cedars residential development.

Planned transit service: The TIS provided documentation of correspondence with a DTC representative who stated that no transit amenities are needed at this time. DTC has no plans to provide transit service to the area in the near future.

Existing bicycle and pedestrian facilities: The following study area roadways are identified as "Bicycling Routes" on the *Sussex County Bicycle Map* published by DelDOT:

- Delaware Route 20:
  - Regional Bicycle Route with bikeway
  - Over 5,000 vehicles daily
- Bayard Road: Connector bicycle route without bikeway
- Johnson Road: Connector bicycle route without bikeway

There are no existing sidewalks or exclusive pedestrian facilities in the immediate area of the proposed site entrance on Delaware Route 20. There are however new pedestrian facilities and bike lanes at the Delaware Route 20 & Bayard / Johnson Road intersection in the eastbound direction.

Planned bicycle and pedestrian facilities: The TIS provided documentation of correspondence with a representative from DelDOT's Local Systems Planning Section who was contacted to determine requested accommodations for bicycles and pedestrians. It is requested that a 10-foot-wide Multi-Use Pathway would be needed across the frontage.

Previous Comments

In a review letter dated February 5, 2020, DelDOT indicated that the revised Preliminary TIS was acceptable as submitted.

It appears that all substantive comments from DelDOT's TIS Scoping Memorandum, Traffic Count Review, Preliminary TIS Review, and other correspondence were addressed in the Final TIS submission.

General HCS Analysis Comments

(see table footnotes on the following pages for specific comments)

1) Both The Traffic Group, Inc. and McCormick Taylor utilized Highway Capacity Software (HCS) version 7.8 to complete the traffic analyses.

2) As per HCM methodologies, The Traffic Group and McCormick Taylor applied percent heavy vehicles (HV) by lane at all-way stop control intersections. In general, existing HV were applied to future conditions as well. For new intersections, 3% was assumed as per the DelDOT Development Coordination Manual section 2.2.8.11.6.H.

3) For existing conditions, the TIS and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F.

Table 2
Peak Hour Levels of Service (LOS)
Based on Twin Cedars Traffic Impact Study – March 2020
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [1] **One-Way Stop (T-Intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 20 & **Site Access**	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2026 with Twin Cedars (Case 3)						
Westbound DE 20 – Left	A (7.9)	A (8.3)	A (8.6)	A (7.9)	A (8.3)	A (8.6)
Northbound Site Access	B (12.9)	B (14.1)	C (19.8)	B (12.9)	B (14.1)	C (19.8)

[1] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 3
Peak Hour Levels of Service (LOS)
Based on Twin Cedars Traffic Impact Study – March 2020
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [2] **One-Way Stop (T-Intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 20 & **Deer Run Road**	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2019 Existing (Case 1)						
Westbound DE 20 – Left	A (7.8)	A (7.9)	A (8.2)	A (7.8)	A (7.9)	A (8.2)
Northbound Deer Run Road	B (10.8)	B (10.8)	B (12.5)	B (10.8)	B (10.8)	B (12.5)
2026 without Twin Cedars (Case 2)						
Westbound DE 20 – Left	A (7.9)	A (8.0)	A (8.3)	A (7.9)	A (8.0)	A (8.3)
Northbound Deer Run Road	B (11.3)	B (11.2)	B (13.0)	B (11.3)	B (11.2)	B (13.0)
2026 with Twin Cedars (Case 3)						
Westbound DE 20 – Left	A (7.9)	A (8.1)	A (8.4)	A (7.9)	A (8.1)	A (8.4)
Northbound Deer Run Road	B (11.6)	B (11.6)	B (13.4)	B (11.6)	B (11.6)	B (13.4)

[2] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 4
Peak Hour Levels of Service (LOS)
Based on Twin Cedars Traffic Impact Study – March 2020
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [3] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 20 & Bayard Road / Johnson Road	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2019 Existing (Case 1)						
Eastbound DE 20 – Left	A (7.8)	A (8.0)	A (8.6)	A (7.8)	A (8.0)	A (8.6)
Westbound DE 20 – Left	A (7.7)	A (7.8)	A (8.1)	A (7.7)	A (7.8)	A (8.1)
Northbound Johnson Road	B (14.9)	C (16.6)	D (30.3)	B (14.9)	C (16.7)	D (30.6)
Southbound Bayard Road	C (17.1)	C (18.3)	F (70.9)	C (17.6)	C (18.9)	F (82.6)
2026 without Twin Cedars (Case 2)						
Eastbound DE 20 – Left	A (7.9)	A (8.1)	A (8.8)	A (7.9)	A (8.1)	A (8.8)
Westbound DE 20 – Left	A (7.7)	A (7.8)	A (8.2)	A (7.7)	A (7.8)	A (8.2)
Northbound Johnson Road	C (16.4)	C (19.8)	E (47.2)	C (16.5)	C (19.9)	E (49.1)
Southbound Bayard Road	C (21.2)	C (24.1)	F (206.3)	C (22.1)	D (25.4)	F (238.9)
2026 with Twin Cedars (Case 3)						
Eastbound DE 20 – Left	A (8.0)	A (8.2)	A (8.9)	A (8.0)	A (8.2)	A (8.9)
Westbound DE 20 – Left	A (7.8)	A (7.9)	A (8.2)	A (7.8)	A (7.9)	A (8.2)
Northbound Johnson Road	C (18.6)	C (23.5)	F (76.2)	C (18.6)	C (23.6)	F (86.1)
Southbound Bayard Road	D (25.5)	D (29.1)	F (310.7)	D (27.5)	D (31.1)	F (354.3)

[3] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Appendix 10 – Utility Analysis

"Sewer Concept Evaluation Study", Sussex County Engineering Department, September 23, 2019

"Ability to Serve Letter", Artesian Water Company, March 10, 2021

ENGINEERING DEPARTMENT

ADMINISTRATION	(302) 855-7718
AIRPORT & INDUSTRIAL PARK	(302) 855-7774
ENVIRONMENTAL SERVICES	(302) 855-7730
PUBLIC WORKS	(302) 855-7703
RECORDS MANAGEMENT	(302) 854-5033
UTILITY ENGINEERING	(302) 855-7717
UTILITY PERMITS	(302) 855-7719
UTILITY PLANNING	(302) 855-1299
FAX	(302) 855-7799

Sussex County
DELAWARE
sussexcountyde.gov

HANS M. MEDLARZ, P.E.
COUNTY ENGINEER

JOHN J. ASHMAN
DIRECTOR OF UTILITY PLANNING

SEWER SERVICE CONCEPT EVALUATION (SSCE)

UTILITY PLANNING DIVISION

Applicant: Morris & Ritchie Associates, Inc.

Date: 9/23/2019

Reviewed by: **Chris Calio**

Agreement #:**943-1**

Project Name: **Twin Cedars**

Tax Map & Parcel(s): **533-11.00-42.00**

Sewer Tier: Tier 1 - Sussex County Unified Sanitary Sewer District

Proposed EDUs: **258**

Pump Station(s) Impacted: **PS 305 & PS 30**

List of parcels to be served, created from the base parcel: **N/A.**

List of additional parcels to be served (Parcels required for continuity must be served with infrastructure): **533-11.00-44.00**

Connection Point(s): **Manhole JC-111 or JC-110**

Use of Existing Infrastructure Agreement required? Yes ☒ or No ☐

Annexation Required? Yes ☐ or No ☒

Easements Required? Yes ☒ or No ☐

Fee for annexation (based on acreage):**N/A**

Current Zoning: **C-1 & GR** Zoning Proposed: **C-1 & GR w/ RPC overlay**

Acreage: **64.22**

Additional Information: **Click or tap here to enter text.**

* No capacity is guaranteed until System Connection Fees are paid

All gravity sewers with three (3) or more minor branches shall be designed at minimum slope and maximum depth.

Once Construction Drawings are completed with all of the above information satisfied, please submit to:

Sussex County Public Works Department
2 The Circle
P.O. Box 589
Georgetown DE 19947

CC: John Ashman
Jayne Dickerson
Michael Brady
Noell Warren

March 10, 2021

Mr. Henry Mast
Bay Developers, LLC
220 Weston Drive
Dover, DE 19904

RE: Twin Cedars Subdivision Ability to Serve Letter

With reference to your request concerning Water Service ("Service") for the proposed Twin Cedars Subdivision Project on Zion Church Road in Baltimore Hundred, Sussex County, Delaware known as Tax Parcel Number 533-11.00-42.00 (the "Property"), please be advised as follows:

Subject to the following conditions, Artesian Water Company, Inc. ("Artesian") is willing and able to provide Service to the Property that meets all applicable State of Delaware, Delaware Department of Natural Resources and Environmental Control standards. Artesian currently has the water Certificate of Public Convenience and Necessity ("CPCN") from the Delaware Public Service Commission (the "Commission"). Artesian will provide Service in accordance with Artesian's Commission approved tariffs, as amended from time to time.

Based on current conditions and subject to the development entity and Artesian entering Water Service Agreements ("Agreements") that addresses the financial terms of the provision of Service for the Property, in accordance with Artesian's tariff, Artesian is willing and able to provide the required Service for this Property.

This letter shall expire if Agreements are not executed within one year of the date of this letter.

Yours very truly,

ARTESIAN WATER COMPANY, INC.

Katherine E. Garrison

Katherine E. Garrison
Senior Planning Designer

STATE OF DELAWARE
EXECUTIVE DEPARTMENT
OFFICE OF STATE PLANNING COORDINATION

August 21, 2019

Mr. Christopher Flathers, P.E.
Morris & Ritchie Associates, Inc.
18 Boulden Circle, Suite 36
New Castle, DE 19720

RE: PLUS review 2019-07-05; Twin Cedars

Dear Mr. Flathers:

Thank you for meeting with State agency planers on July 24, 2019 to discuss the proposed plans for the Twin Cedars project. According to the information received you are seeking review of a 254 unit subdivision on 64.22 acres along Zion Church Road in Sussex County.

Please note that changes to the plan, other than those suggested in this letter, could result in additional comments from the State. Additionally, these comments reflect only issues that are the responsibility of the agencies represented at the meeting. **The developers will also need to comply with any Federal, State, and local regulations regarding this property. We also note that as Sussex County is the governing authority over this land, the developers will need to comply with any and all regulations/restrictions set forth by the county.**

Strategies for State Policies and Spending

This project is located in Investment Level 3 according to the Strategies for State Policies and Spending. Investment Level 3 reflects areas where growth is anticipated by local, county, and state plans in the longer term future, or areas that may have environmental or other constraints to development. State investments may support future growth in these areas, but may have priorities for the near future. Level 3 area means there may be environmental concerns on or near the parcel and we would encourage you to design the site with respect for the environmental features which are present.

Code Requirements/Agency Permitting Requirements

Department of Transportation – Contact Bill Brockenbrough 760-2109

- The site access on Zion Church Road (Delaware Route 20) must be designed in accordance with DelDOT's Development Coordination Manual, which is available at http://www.deldot.gov/Business/subdivisions/index.shtml?dc=changes.

- Pursuant to Section P.3 of the Manual, a Pre-Submittal Meeting is required before plans are submitted for review. The form needed to request the meeting and guidance on what will be covered there and how to prepare for it is located at https://www.deldot.gov/Business/subdivisions/pdfs/Meeting_Request_Form.pdf?08022017.

- Section P.5 of the Manual addresses fees that are assessed for the review of development proposals. DelDOT anticipates collecting the Initial Stage Fee when the record plan is submitted for review and the Construction Stage Fee when construction plans are submitted for review.

- Per Section 2.2.2.1 of the Manual, Traffic Impact Studies (TIS) are warranted for developments generating more than 500 vehicle trip ends per day or 50 vehicle trip ends per hour in any hour of the day. From the PLUS application, the total daily trips are estimated at 2,030 vehicle trip ends per day. DelDOT calculates a higher number, 2,051 vehicle trip ends per day, but regardless the warrant for a TIS is met.

  On July 30, 2008, DelDOT commented to the County on its review of a TIS for an earlier plan to develop these lands. Having reviewed the attached letter, DelDOT finds that a new TIS, conforming to current DelDOT regulations, is needed to address the plan now proposed. The primary purpose of a TIS is to determine the need for off-site transportation improvements. Without prejudging the results of the TIS, DelDOT expects to require turning lanes at the site entrance and a signal agreement for the intersection of Zion Church Road, Johnson Road aka Bunting Road (Sussex Road 382A) and Bayard Road (Sussex Road 384).

- As necessary, in accordance with Section 3.2.5 and Figure 3.2.5-a of the Manual, DelDOT will require dedication of right-of-way along the site's frontage on Zion Church Road. By this regulation, this dedication is to provide a minimum of 40 feet of right-of-way from the physical centerline along both roads. The following right-of-way dedication note is required, "**An X-foot wide right-of-way is hereby dedicated to the State of Delaware, as per this plat.**"

- In accordance with Section 3.2.5.1.2 of the Manual, DelDOT will require the establishment of a 15-foot wide permanent easement across the property frontage on Zion Church Road. The location of the easement shall be outside the limits of the ultimate right-of-way. The easement area can be used as part of the open space calculation for the

site. The following note is required, "**A 15-foot wide permanent easement is hereby established for the State of Delaware, as per this plat.**"

- Referring to Section 3.4.2.1 of the Manual, the following items, among other things, are required on the Record Plan:
    - A Traffic Generation Diagram. See Figure 3.4.2-a for the required format and content.
    - Depiction of all existing entrances within 600 feet of the entrances on Zion Church Road.
    - Notes identifying the type of off-site improvements, agreements (signal, letter) contributions and when the off-site improvements are warranted.
- Section 3.5 of the Manual provides DelDOT's requirements with regard to connectivity. The requirements in Sections 3.5.1 through 3.5.3 shall be followed for all development projects having access to state roads or proposing DelDOT maintained public streets for subdivisions. DelDOT supports the proposed extension of Road B.
- Section 3.5.4.2 of the Manual addresses requirements for shared-use paths and sidewalks. For projects in Level 1 and 2 Investment Areas, installation of paths or sidewalks along the frontage on State-maintained roads is required. DelDOT anticipates requiring the developer to build a Shared Use Path along their frontage on Zion Church Road.
- Referring to Section 3.5.5 of the Manual, existing and proposed transit stops and associated facilities as required by the Delaware Transit Corporation (DTC) or DelDOT shall be shown on the Record Plan.
- In accordance with Section 3.8 of the Manual, storm water facilities, excluding filter strips and bioswales, shall be located a minimum of 20 feet from the ultimate State right-of-way along Zion Church Road.
- In accordance with Section 5.2.9 of the Manual, the Auxiliary Lane Worksheet should be used to determine whether auxiliary lanes are warranted at the site entrances and how long those lanes should be. The worksheet can be found at http://www.deldot.gov/Business/subdivisions/index.shtml.
- In accordance with Section 5.14 of the Manual, all existing utilities must be shown on the plan and a utility relocation plan will be required for any utilities that need to be relocated.

Department of Natural Resources and Environmental Control – Contact Michael Tholstrup 735-3352

Habitat of Conservation Concern (Site Assessment)

- This project parcel was surveyed on September 21, 2006 to search for habitat of conservation concern and to assess the ecological quality of the area. A copy of this report has been included with these comments. During the survey, the forest at this site was determined to be 25 to 75 years of age; however, some individuals were identified that were likely 100 years of age or greater.

  Contact the Division of Fish and Wildlife for assistance in identifying, preserving, and managing the existing forest on-site. For technical assistance or to schedule a site visit please contact Katie Kadlubar, Kathryn.Kadlubar@delaware.gov.

Wetland and Forest Preservation

- DNREC mapping indicates presence of forested wetlands and hydric soils (Hurlock) which encompass a large portion of the subject parcel.

- DNREC botanist, Bill McAvoy, can assist in drafting a list of plants suitable for this site. Bill can be contacted at (302) 735-8668 or William.McAvoy@delaware.gov.

State Historic Preservation Office – Contact Carlton Hall 736-7404

- There are no known archaeological sites or known National Register listed or eligible properties on the parcel. There was a farmstead that disappeared by 1965. There is a suspicious tree spot on the 1937 aerial east of the house that may indicate a cemetery. The soils range from somewhat poorly drained to very poorly drained. There is potential for a mid-19th century archaeological site and possibly a cemetery. Therefore, our office recommends an archaeological survey of the project area. If you have any questions please contact our office for assistance at 302-736-7408.

- If any project or development proceeds, the developer should be aware of the Unmarked Human Burials and Human Skeletal Remains Law (Del. C. Title 7, Ch. 54). Prior to any demolition or ground-disturbing activities, the developer should hire an archaeological consultant to examine the parcel for archaeological resources, including unmarked human burials or human skeletal remains, to avoid those sites or areas.

- If there is federal involvement, in the form of licenses, permits, or funds, the federal agency, often through its client, is responsible for complying with Section 106 of the National Historic Preservation Act (36 CFR 800) and must consider their project's effects on any known or potential cultural or historic resources. For further information on the Section 106 process please review the Advisory Council on Historic Preservation's website at: www.achp.gov

Delaware State Fire Marshall's Office – Contact Duane Fox 259-7037
At the time of formal submittal, the applicant shall provide; completed application, fee, and three sets of plans depicting the following in accordance with the Delaware State Fire Prevention Regulation (DSFPR):

Fire Protection Water Requirements:

- Water distribution system capable of delivering at least 1000 gpm for 1-hour duration, at 20-psi residual pressure is required. Fire hydrants with 800 feet spacing on centers.
- Where a water distribution system is proposed for residential sites, the infrastructure for fire protection water shall be provided, including the size of water mains for fire hydrants and sprinkler systems.

Fire Protection Features:

- All structures over 10,000 Sq. Ft. aggregate will require automatic sprinkler protection installed.
- Buildings occupied as apartments (multi-family living units comprising of 3 or more units) will require automatic sprinkler protection installed.
- Buildings greater than 10,000 sq. ft., 3-stories or more, over 35 feet, or classified as High Hazard, are required to meet fire lane marking requirements
- For townhouse buildings, provide a section / detail and the UL design number of the 2-hour fire rated separation wall on the Site plan
- Show Fire Department Connection location (Must be within 300 feet of fire hydrant), and detail as shown in the DSFPR.
- Show Fire Lanes and Sign Detail as shown in DSFPR

Accessibility:

- All premises, which the fire department may be called upon to protect in case of fire, and which are not readily accessible from public roads, shall be provided with suitable gates and access roads, and fire lanes so that all buildings on the premises are accessible to fire apparatus. The road island at the entrance from the main thoroughfare must be constructed so fire department apparatus may negotiate it.
- Fire department access shall be provided in such a manner so that fire apparatus will be able to locate within 100 ft. of the front door.
- Any dead end road more than 300 feet in length shall be provided with a turn-around or cul-de-sac arranged such that fire apparatus will be able to turn around by making not more than one backing maneuver. The minimum paved radius of the cul-de-sac shall be 38 feet. The dimensions of the cul-de-sac or turn-around shall be shown on the final plans. Also, please be advised that parking is prohibited in the cul-de-sac or turn around.
- The use of speed bumps or other methods of traffic speed reduction must be in accordance with Department of Transportation requirements.
- The local Fire Chief, prior to any submission to our Agency, shall approve in writing the use of gates that limit fire department access into and out of the development or property.

Gas Piping and System Information

- Provide type of fuel proposed, and show locations of bulk containers on plan.

Required Notes:

- Provide a note on the final plans submitted for review to read " All fire lanes, fire hydrants, and fire department connections shall be marked in accordance with the Delaware State Fire Prevention Regulations"
- Proposed Use
- Alpha or Numerical Labels for each building/unit for sites with multiple buildings/units
- Square footage of each structure (Total of all Floors)
- National Fire Protection Association (NFPA) Construction Type
- Maximum Height of Buildings (including number of stories)
- Note indicating if building is to be sprinklered
- Name of Water Provider
- Letter from Water Provider approving the system layout
- Provide Lock Box Note (as detailed in DSFPR) if Building is to be sprinklered
- Provide Road Names, even for County Roads

Sussex County – Contact Rob Davis 302-855-7820

- The parcel is within Tier 1 - Sussex County Unified Sanitary Sewer District and sewer service is available. A sewer system concept evaluation must be requested to define a connection point.

  The proposal for 254-unit subdivision 64.22 acres is within sewer system design assumptions and sewer capacity can be assumed. A "Use of Existing Infrastructure Agreement" is required and must be approved prior to approval of construction plans. Sussex County Code, Chapter 110, requires that the Engineer and/or Developer request a Sewer System Concept Evaluation (SSCE) from the Utility Planning Department for their project by providing the parcel(s) estimated equivalent dwelling units (EDU) for the project, along with payment of $1,000.00 payable to Sussex County Council. The Utility Planning Department will review the parcel(s) and EDU, confirm capacity, provide the connection point and define any additional parcels that must be served as part of the project. Should it be determined that a pump station is required for the project, additional information may be requested. This information will be conveyed to the engineer and/or developer as well as the Sussex County Public Works department. The Public Works Division will use this information when reviewing construction drawings to verify that the correct connection point is used, and all required parcels are served.

- The proposed development will require a developer installed collection system in accordance with Sussex County standards and procedures.

- Onetime system connection charges will apply. Please contact the Utility Permits Division at 302 855-7719 for additional information on charges.

Recommendations/Additional Information

This section includes a list of site specific suggestions that are intended to enhance the project. These suggestions have been generated by the State Agencies based on their expertise and subject area knowledge. **These suggestions do not represent State code requirements.** They are offered here in order to provide proactive ideas to help the applicant enhance the site design, and it is hoped **(but in no way required)** that the applicant will open a dialogue with the relevant agencies to discuss how the suggestions can benefit the project.

Department of Transportation – Contact Bill Brockenbrough 760-2109

- The applicant should expect a requirement that any substation and/or wastewater facilities will be required to have access from an internal driveway with no direct access to Zion Church Road.

- The applicant should expect a requirement that all PLUS and Technical Advisory Committee (TAC) comments be addressed prior to submitting plans for review.

- Please be advised that the Standard General Notes have been updated and posted to the DelDOT website. Please begin using the new versions and look for the revision dates of March 21, 2019 and March 25, 2019. The notes can be found at https://www.deldot.gov/Business/subdivisions/

Department of Natural Resources and Environmental Control – Contact Michael Tholstrup 735-3352

Habitat of Conservation Concern (Site Assessment)

- Small animals, such as salamanders have difficulty climbing vertical curbs. DNREC recommends designing the development to exclude curbs is best for these species but if road curbing is part of the design, curbing that allows small animals to climb out of the roadbed (such as Cape Cod curbing) is preferred over steep, vertical curbing.

- Avoid installing sewers with grates, which can create a hazard for amphibians and reptiles.

- Any culverts installed should be open bottom box culverts to allow for natural substrate to remain and in-water passage of aquatic life. Additionally, culverts should be left as wide as possible to ensure that salamanders can travel through them.

- To deter waterfowl from taking up residence in the stormwater ponds, DNREC recommends planting pond perimeters with a mix of native grasses and wildflowers (to be planted in accordance with Sediment and Stormwater Plan requirements and delegated agency approval). In addition to deterring nuisance waterfowl, the native wildflower mix will also serve to attract pollinators like bees and butterflies, and reduce run-off, which can contain pollutants from nearby impervious surfaces.

Wetland and Forest Preservation

- Given the benefit of trees in erosion control and flood abatement, tree removal for construction activities and stormwater management should be minimized. The site plan should be designed in a way that allows for preservation of as much of this wooded area as feasible.

- Restrict forest clearing and disturbance of soil to the footprint of buildings and infrastructure. Re-seed and stabilize disturbed areas immediately. Landscape with native species.

- To reduce impacts to nesting birds and other wildlife species that utilize forests for breeding, forest clearing should not occur April 1st to July 31st.

- Low spillage lights (those that reflect light directly downward onto the illuminated area) should be used on roads and homes within 750 feet of the forested wetlands on site. Fluorescent and mercury vapor lighting should not be used.

- Green-technology stormwater management is highly recommended. Efforts to mitigate for impervious cover (pervious pavers) should also be implemented where applicable. Avoid diverting surface water from roadways and stormwater facilities into the wetlands on-site. Water quality could be detrimentally affected by run-off which can contain oil and other pollutants, such as fertilizers and other lawn treatments applied by homeowners.

- Avoid causing increases or decreases in water levels by maintaining inputs to natural wetlands at pre-construction levels.

- To protect the function and integrity of wetlands, a minimum 100-foot buffer should be left intact around the perimeter of remaining waterbodies or wetlands on site. Buffers reduce the amount of non-point source pollution entering waterways that could negatively affect habitat function and aquatic organism survival.

Delaware State Fire Marshall's Office – Contact Duane Fox 259-7037

- Although not a requirement of the State Fire Prevention Regulations, the Office of the State Fire Marshal encourages home builders to consider the benefits of home sprinkler

protection in dwellings, including single family dwellings and townhomes. The Office of the State Fire Marshal also reminds home builders that they are obligated to comply with requirements of Subchapter III of Chapter 36 of Title 6 of the Delaware Code which can be found at the following website: http://delcode.delaware.gov/title6/c036/sc03/index.shtml

- Preliminary meetings with fire protection specialists are encouraged prior to formal submittal. Please call for appointment. Applications and brochures can be downloaded from our website: www.statefiremarshal.delaware.gov technical services link, plan review, applications or brochures.

State Housing Authority – Contact: Jonathan Adkins-Taswell 739-4263

- DSHA strongly supports the site plan for 254 units of 168 multi-family apartments on 64.22 acres along Zion Church Road in Sussex County. This would provide Sussex County an excellent opportunity to facilitate a more affordable housing product in the southern Coastal Area. The need for housing affordable to the many county residents who work in this resort economy is acute and well documented. Considering the site's close proximity to the Rt. 54 and north of Selbyville and location within a DSHA-defined "Areas of Opportunity" provides economic opportunity, high performing school district, and supportive infrastructure that help households succeed. This is an excellent location for a more affordable housing product. As a result, DSHA recommends that Sussex County embrace the opportunity to approve this proposal permitting residents to live close to their jobs, as well as, access the resources and benefits this area provides.
- DSHA encourages a site layout and quality design measures that creates desirable rental units which are vital to any well-balanced community, the intensity of the proposal warrants design measures to create human-scaled, and pedestrian-oriented community. Incorporating attractive streetscapes, community recreation areas, visually appealing façade treatments, significant landscaping and pedestrian-oriented measures will help the proposal to integrate well into the larger coastal area.
- If you have any questions or would like more information, please feel free to call me at (302) 739-4263 ext. 245 or via e-mail at Jonathan@destatehousing.com.

In addition to the comments above our office has received a letter from Brandy Nauman, Sussex County Housing Coordinator & Fair Housing Compliance Officer. A copy of that letter is enclosed wit this letter.

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

Thank you for the opportunity to review this project. If you have any questions, please contact me at 302-739-3090.

Sincerely,

Constance C. Holland, AICP
Director, Office of State Planning Coordination

CC: Sussex County Planning

Enclosure
Attachment

BRANDY BENNETT NAUMAN
HOUSING COORDINATOR &
FAIR HOUSING COMPLIANCE OFFICER
(302) 855-7777 T
(302) 854-5397 F
bnauman@sussexcountyde.gov

Sussex County
DELAWARE
sussexcountyde.gov

July 22, 2019

Mr. Christopher Flathers
Morris & Ritchie Associates, Inc.
18 Boulden Circle, Suite 36
New Castle, DE 19720

RE: Twin Cedars – PLUS Review (PLUS 2019-07-05)

Dear Mr. Flathers,

Sussex County endeavors to promote non-discrimination and affordable housing whenever possible throughout the County. In this regard, the developer and associated financial institutions are encouraged to provide and finance affordable housing opportunities to Sussex County residents in all new developments, and affirmatively market those affordable housing units to diverse populations.

For questions about opportunities available for affordable housing projects within Sussex County, please consult Sussex County's "Affordable Housing Support Policy". The policy along with other resources are available on the County's Affordable & Fair Housing Resource Center website: www.sussexcountyde.gov/affordable-and-fair-housing-resource-center. The County's Community Development & Housing Department can advise about existing affordable housing opportunities in Sussex County and the appropriate County Department to contact regarding specific development issues concerning future affordable housing projects within Sussex County.

The Community Development & Housing Department can also explain and assist with any financial support or incentives that may be available to a project from federal, state and county sources, as well as private funding sources that also promote affordable housing in Sussex County.

Please understand that all residential projects, including Affordable Housing Projects are subject to the applicable provisions of the Sussex County Subdivision and Zoning Codes, and the approval processes set forth in those Codes.

On behalf of Sussex County, we look forward to cooperating with you and your project as it moves forward.

Thank you,

Brandy B. Nauman
Housing Coordinator &
Fair Housing Compliance Officer

EQUAL HOUSING OPPORTUNITY

1 October 2006

Roger Black
Charles/Black Companies, LLC
7820 B-1 Penn Western Ct.
Upper Marlboro, MD 20772

RE: "Twin Cedars" development project (parcel ID: 5-33-11.00-42.00), Sussex Co., southeast of Frankford and Roxana

Dear Mr. Black,

On 21 September 2006, I meet with you at the above referenced site to tour the property and search for unique habitat that may support rare and uncommon species, as well as to asses the overall ecological quality of the natural areas that occur on site.

The natural areas on the property are found in the southern half of the site and consist of about 38 acres of forest. The majority of the forest appears to be poorly drained and could be classified as forested wetland, with the remainder being moist to well drained uplands. The poorly drained areas of forest are mid-to-late successional (about 50 to 75 years of age), and the moist to well drained areas are early-to-mid successional (about 25 to 50 years of age). The forested wetland areas are likely older in age due to the fact that it is more difficult to clear trees in poorly drained soils then in moist or well drained soils. The forest canopy is composed of a variety of deciduous [red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), willow oak (*Quercus phellos*), scarlet oak (*Q. coccinea*), white oak (*Q. alba*), black gum (*Nyssa sylvatica*)] and evergreen [loblolly pine (*Pinus taeda*)] tree species. In the lower strata, the following shrubs and small trees were encountered: sweet pepper bush (*Clethra alnifolia*), high bush blueberry (*Vaccinium corymbosum*), arrow-wood (*Viburnum dentatum*), and sweet bay magnolia (*Magnolia virginiana*). The dominant herbaceous plants of the forest floor included: netted chain fern (*Woodwardia areolata*), Virginia chain fern (*W. virginica*), cinnamon fern (*Osmunda cinnamomea*), and Indian cucumber root (*Medeola virginiana*). There is good structural diversity within this forest, with areas of dense to sparse shrub cover, and scattered canopy gaps. Coarse woody debris is evident throughout the forest with many standing dead trunks observed. A few drainage ditches in the northeast portion of the forest appear to be quite old in age and may only have a limited affect on the overall hydrology of the site. Found infrequently scattered through the forested wetland area, were small pockets containing large individuals (30 to 40 inches in diameter) of willow oak and loblolly pine. These trees are likely to be at least 100 years of age or greater. The forested southern half of the property is somewhat isolated ecologically, with only limited connectivity to early successional woodlands in the southwest and southeast corners. Overall, I would rank the quality of this forest as fair, although the forested wetland portions of the site are of good quality. No state rare plant species of concern, or federally listed plants were discovered on this day and the potential for future discoveries is low. However, based on the ecological characteristics of the site, it is likely a valuable area for wildlife species, particularly songbirds that may be utilizing the area for breeding and foraging, and also for species of reptiles and amphibians, especially salamanders.

The preliminary design for the Twin Cedars development designates the majority of the forest (24 acres) as open space, with most of the forested wetlands being preserved. However, lots and storm water basins planned for the southeast portion of the forest may be impacting some of the pockets mentioned above that support large willow oaks and loblolly pines. Scaling-down, or eliminating these lots and basins would go far to help maintain the current ecological condition of the forest. Of course preserving the forest in its entirety would be ideal. If this is an option that you would consider, putting the forested area of the property in a conservation easement would offer financial incentives. For more information about conservation easements, contact Tim Kaden at the Division of Parks and Recreation (302-739-9235, timothy.kaden@state.de.us).

The Delaware Natural Heritage Program appreciates the opportunity to visit this site and to comment on the development design. The data collected here will be added to our plant community database and will add to our overall knowledge of the forest types of southeast Sussex County.

If you have any questions or concerns regarding this brief report, don't hesitate to write or call.

Respectfully,

William A. McAvoy
Botanist, Delaware Natural Heritage Program
William.mcavoy@state.de.us

cc: Karen Bennett, Edna Stetzar, Rober Coxe, Kevin Coyle, Connie Holland, Robert Zimmerman, Stephanie Hansen

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

CAROLANN WICKS, P.E.
SECRETARY

July 30, 2008

Mr. Lawrence B. Lank
Director
Sussex County Planning & Zoning Commission
P.O. Box 417
Georgetown, DE 19947

Dear Mr. Lank:

The attached Traffic Impact Study (TIS) review letter for the **Twin Cedars** development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Rules and Regulations for Subdivision Streets and other accepted practices and procedures for such studies. DelDOT accepts this TIS review and concurs with the recommendations. We are providing it to you in fulfillment of our joint agreement regarding the review of TIS. If you have any questions concerning this letter or the attached review letter, please contact me at (302) 760-2134.

Sincerely,

Todd Sammons
Project Engineer

TS:km
Enclosures
cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Derrick Kennedy, Orth-Rodgers & Associates, Inc.
Mr. Andrew J. Parker, McCormick Taylor
Mr. Mir Wahed, Johnson, Mirmiran, and Thompson
DelDOT Distribution

DelDOT

DelDOT Distribution

Frederick H. Schranck, Deputy Attorney General
Darrel Cole, Chief of Community Relations, Public Relations
Robert Taylor, Director, Transportation Solutions (DOTS)
Ralph A. Reeb, Director, Division of Planning
Michael H. Simmons, Assistant Director, Project Development South, DOTS
Donald D. Weber, Chief Traffic Engineer, Traffic, DOTS
Mark Luszcz, Assistant Chief Traffic Engineer, Traffic, DOTS
Thomas E. Meyer, Traffic Studies Manager, Traffic, DOTS
Theodore G. Bishop, Assistant Director, Development Coordination
Joseph Wright, Assistant Director, Transportation Engineering
Marvin Roberts, Public Works Manager, South District
Jennifer Pinkerton, Deputy Principal Assistant, Pavement Management
William J. Dryden, Transportation Planner, Project Development South, DOTS
Lisa Collins, Service Development Planner, Delaware Transit Corporation
Marc Coté, Subdivision Engineer, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
John Fiori, Subdivision Manager, Development Coordination
Anthony Aglio, Bicycle and Pedestrian Coordinator, Statewide & Regional Planning
Troy Brestel, Project Engineer, Development Coordination

McCormick Taylor
Engineers & Planners Since 1946

July 30, 2008

Mr. Todd J. Sammons
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1404
Traffic Impact Study Services
Task No. 19A – Twin Cedars

Dear Mr. Sammons,

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for Twin Cedars prepared by Orth-Rodgers & Associates, Inc (ORA) for McCrone Inc., dated April 18, 2008. This review was assigned as Task Number 19A. ORA prepared the report in a manner generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*.

The TIS evaluates the impacts of Twin Cedars, proposed to be located along the south side of Zion Church Road (Delaware Route 20 / Sussex Road 382), between Deer Run Road (Sussex Road 388) and Johnson Road (Sussex Road 389) / Bayard Road (Sussex Road 384) in Sussex County, Delaware. The proposed development would consist of 31 single-family detached houses, 120 apartments, 80 townhouses and 40,000 square feet of retail on approximately 64 acres of land. Two access points are proposed along Zion Church Road. Construction is anticipated to be complete by 2012.

As evaluated by the TIS and McCormick Taylor, the proposed development of The Estuary was considered as one of the committed developments. However, we now understand The Estuary is no longer moving forward. As a result, the future analyses conducted by the TIS and McCormick Taylor, for a number of intersections, are based on volumes that are greater than anticipated without The Estuary. However, the recommendations included in this letter would be needed whether or not The Estuary is ever built.

DelDOT currently has one relevant project near the study area. The *SR 54, Mainline Improvements* project (State Contract No. 24-112-01) includes improvements planned along Delaware Route 54 (Sussex Road 58 / Lighthouse Road) east of Zion Church Road to Keenwick Road (Sussex Road 58C), which will include two 12-foot travel lanes, a 14-foot center left-turn lane, two eight-foot shoulders, two three-foot grass buffers, and two five-foot sidewalks. In addition, a reconstruction project was recently completed for the intersection of Zion Church Road and Delaware Route 54, which realigned the intersection and added a fourth leg for the Americana Bayside development.

Based on our review, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	***Situations for which deficiencies occur***
Zion Church Road and East Site Entrance	2012 Saturday with Twin Cedars
Zion Church Road and West Site Entrance	2012 Saturday with Twin Cedars
Zion Church Road and Johnson Road / Bayard Road	2012 AM, PM, and Saturday without and with Twin Cedars

Should the County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should improve Zion Church Road from Deer Run Road to the eastern edge of the site frontage in order to meet DelDOT's major collector road standards. These standards include but are not limited to twelve-foot travel lanes and eight-foot shoulders. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.

2. The developer should construct the two site entrances on Zion Church Road to each include a separate right-turn lane on the eastbound Zion Church Road approach and a separate left-turn lane on the westbound Zion Church Road approach. Each northbound site entrance approach should consist of one left-turn lane and one right-turn lane.

3. The developer should enter into a traffic signal agreement with DelDOT for one of the two proposed site entrances along Zion Church Road, to be determined at DelDOT's discretion. The agreement should include pedestrian signals, crosswalks and interconnection at DelDOT's discretion, and the developer will be required to perform a peak hour and a four-hour signal warrant analysis.

4. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Zion Church Road and Johnson Road / Bayard Road. The agreement should include pedestrian signals, crosswalks and interconnection at DelDOT's discretion. At least one other developer is expected to enter into a traffic signal agreement for this intersection as well. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the traffic signal.

5. The following bicycle, pedestrian, and transit improvements should be included:

   a. The shoulders on Zion Church Road should be maintained and marked as bike lanes from Deer Run Road to the eastern edge of the site frontage.
   b. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of each right-turn lane added to Zion Church Road.
   c. Where right-turn lanes are added to Zion Church Road, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.
   d. Utility covers should be moved outside of the designated bicycle lane or be flush with the pavement.
   e. Covered bike parking should be included near the commercial locations to be included with this development.
   f. A 15-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT for future use within the site frontage along Zion Church Road.
   g. ADA compliant curb ramps should be provided at all pedestrian crossings. Type 3 curb ramps are discouraged.
   h. Internal sidewalks to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. These sidewalks should be constructed to extend to the site entrances, and should connect to the frontage shoulders along Zion Church Road.
   i. The developer should coordinate with the Delaware Transit Corporation regarding the possibility of adding transit services and facilities at this location.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Mark Luszcz of DelDOT's Traffic Section.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's subdivision review process.

Additional details on our review of this TIS are attached. Please contact me at (302) 738-0203 or through e-mail at ajparker@mtmail.biz if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.

Andrew J. Parker, P.E., PTOE
Project Manager

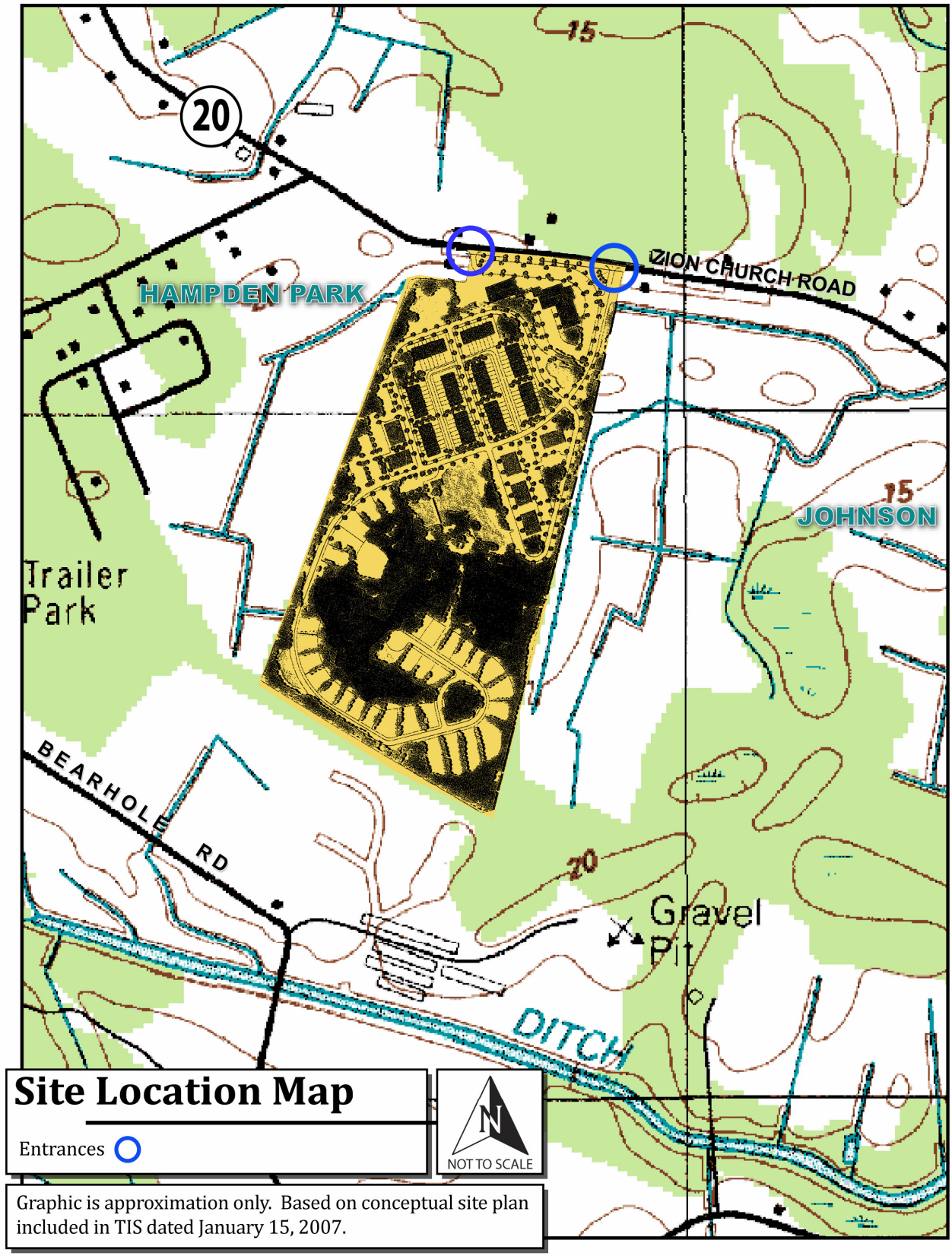
Enclosure

General Information

Report date: April 18, 2008
Prepared by: Orth-Rodgers & Associates, Inc.
Prepared for: McCrone Inc.
Tax parcel: 533-11.00-42.00
Generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*: Yes

Project Description and Background

Description: The proposed development would consist of 31 single-family detached houses, 120 apartments, 80 townhouses and 40,000 square feet of retail.
Location: Twin Cedars is proposed to be located along the south side of Zion Church Road (Delaware Route 20 / Sussex Road 382), between Deer Run Road (Sussex Road 388) and Johnson Road (Sussex Road 389) / Bayard Road (Sussex Road 384) in Sussex County, Delaware. A site location map is included on Page 6.
Amount of land to be developed: approximately 64 acres of land
Land use approval(s) needed: Subdivision approval. The land is currently zoned as GR (General Residential) and C-1 (Commercial) in Sussex County and will be developed under the current zoning.
Proposed completion date: 2012
Proposed access locations: Two access points are proposed along Zion Church Road.


15
20
HAMPDEN PARK
ZION CHURCH ROAD
15
JOHNSON
Trailer
Park
BEARHOLE RD
20
Gravel
Pit
DITCH
Site Location Map
Entrances
N
NOT TO SCALE
Graphic is approximation only. Based on conceptual site plan
included in TIS dated January 15, 2007.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, July 2004)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
The proposed Twin Cedars development is located within Investment Level 4.

Investment Level 4

Areas located within Investment Level 4 are predominantly agricultural; contain agribusiness activities, farm complexes and small settlements that are often found at historic crossroads. These areas contain undeveloped natural areas, including forestland and recreational parks, however may have scattered single-family detached residential houses located within them.

Transportation facilities and services will be preserved by the state while they continue to manage the transportation system in a manner that will support the preservation of the natural environment. The state will limit its investments in water and wastewater systems to existing public health, safety and environmental risks and discourage accommodating further development. In addition, the state will limit continued development of areas within Investment Level 4 to those that enhance agriculture and protect water supplies, preserve critical habitat and maintain existing education and public safety services. Although residential development is not desirable in Investment Level 4, conservation design techniques (protecting large portions of existing open space and farmland while clustering development on a smaller portion of the parcel and using environmentally friendly design innovations) can be utilized in some cases to help ensure that developments are compatible with the rural character and natural resources present in the area. However, it is the state's general intent to discourage additional development in Investment Level 4 areas that are unrelated to the areas' needs by limiting infrastructure investment.

Proposed Development's Compatibility with Livable Delaware:
The proposed Twin Cedars development falls within Investment Level 4 and is to be developed with a mix of residential and commercial sites. According to Livable Delaware, areas classified as an Investment Level 4 are not desirable to be built upon unless preserving the natural and/or agricultural environment already in place. As such, this development appears to be generally inconsistent with the 2004 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plan

Sussex County Comprehensive Plan:
(Source: 2003 Sussex County Comprehensive Plan Update)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development parcel is in a Low Density Area. The purpose of the Low Density Area is to provide for a full range of agricultural activities and to protect agricultural lands as one of the County's most valuable natural resources from the depreciating effect of objectionable, hazardous and unsightly uses. The housing types appropriate for these areas include single-

family detached homes and manufactured homes, where permitted by ordinance. Density guidelines state that the minimum lot size in a Low Density Area without on-site wastewater systems is 0.75 acres, or 0.50 acres if the clustering option is used. If on-site wastewater systems are to be provided, the minimum lot size in a Low Density area is 20,000 square feet (approximately 0.46 acres). Appropriate non-residential uses in a Low Density Area include limited retail and commercial business uses for convenience shopping.

Proposed Development's Compatibility with Comprehensive Plans:
Assuming no open space, the average lot size of this development is approximately 0.28 acres, which is less than the minimum lot size for Low Density Areas. Actually, there will be a certain amount of open space, which would make the average lot size even smaller. Although the limited commercial portion may be deemed appropriate as stated above, the proposed residential land use is generally not appropriate for a Low Density Area and the proposed development appears to be incompatible with the Sussex County Comprehensive Plan.

Transportation Analysis Zone

Transportation Analysis Zones (TAZ) where development would be located: 1188

TAZ Boundaries:

Current employment estimate for TAZ: 608 jobs in 2005
Future employment estimate for TAZ: 734 jobs in 2030

Current population estimate for TAZ: 525 people in 2005
Future population estimate for TAZ: 870 people in 2030
Current household estimate for TAZ: 234 houses in 2005
Future household estimate for TAZ: 392 houses in 2030
Relevant committed developments in the TAZ: None
Would the addition of committed developments to current estimates exceed future projections: No
Would the addition of committed developments and the proposed development to current estimates exceed future projections: Yes

Relevant Projects in the DelDOT Capital Transportation Program (FY 2008 – FY 2013)

DelDOT currently has one relevant project near the study area. The *SR 54, Mainline Improvements* project (State Contract No. 24-112-01) includes improvements planned along Delaware Route 54 (Sussex Road 58 / Lighthouse Road) east of Zion Church Road to Keenwick Road (Sussex Road 58C), which will include two 12-foot travel lanes, a 14-foot center left-turn lane, two eight-foot shoulders, two three-foot grass buffers, and two five-foot sidewalks. In addition, a reconstruction project was recently completed for the intersection of Zion Church Road and Delaware Route 54, which realigned the intersection and added a fourth leg for the Americana Bayside development.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Seventh Edition, published by the Institute of Transportation Engineers (ITE). The following land uses were utilized to estimate the amount of new traffic generated for this development:

- 31 single-family detached houses (ITE Land Use Code 210)
- 120 apartments (ITE Land Use Code 220)
- 80 townhouses (ITE Land Use Code 230)
- 40,000 square feet of retail (ITE Land Use Code 820)

Table 1
TWIN CEDARS TRIP GENERATION

Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
31 single-family detached houses	8	22	30	23	14	37	21	18	39
120 apartments	13	50	63	55	29	84	34	34	68
80 townhouses	7	36	43	33	17	50	36	30	66
Subtotal	28	106	136	111	60	171	91	82	173
Internal Capture	-	-	-	21	15	36	16	12	28
Primary Residential Trips	**28**	**106**	**136**	**90**	**45**	**135**	**75**	**70**	**145**
40,000 square feet of retail	55	35	90	164	178	342	248	229	477
Internal Capture	-	-	-	15	21	36	12	16	28
External Trips	-	-	-	149	157	306	236	213	449
Pass-by Trips	-	-	-	76	80	156	89	81	170
Primary Retail Trips	**55**	**35**	**90**	**73**	**77**	**150**	**147**	**132**	**279**
TOTAL TRIPS	**83**	**143**	**226**	**163**	**122**	**285**	**222**	**202**	**424**

Overview of TIS

Intersections examined:

1) Zion Church Road & East Site Entrance
2) Zion Church Road & West Site Entrance
3) Zion Church Road & Johnson Road / Bayard Road
4) Zion Church Road & Delaware Route 54
5) Zion Church Road & Delaware Route 17 (Sussex Road 52 / Roxana Road)
6) Delaware Route 54 & Johnson Road (Sussex Road 390)
7) Zion Church Road & Deer Run Road
8) Delaware Route 17 & Bixler Road (Sussex Road 388)

Conditions examined:

1) 2007 existing conditions (Case 1)
2) 2012 without Twin Cedars (Case 2)
3) 2012 with Twin Cedars (Case 3)

Peak hours evaluated: Weekday morning and evening, and Saturday mid-day peak hours

Committed developments considered:

1) The Estuary (1,052 single-family detached houses)
2) Americana Bayside (413 single-family detached houses (278 unbuilt), 1,227 condominiums/townhouses (912 unbuilt), 60 assisted-living units (fully built and

occupied), 81,880 square feet of retail, and an 18 hole golf course (fully built and operational))
3) Hamlet at Dirikson Pond (81 single-family detached houses; 28 unbuilt)
4) The Refuge at Dirikson Creek (287 single-family detached houses (77 unbuilt) and 57 townhouses)

Note: Although we now understand The Estuary is no longer moving forward, it was included as a committed development at the time future analyses were conducted by both the TIS and McCormick Taylor.

Intersection Descriptions

1) Zion Church Road & East Site Entrance
Type of Control: proposed two-way stop-controlled (T-intersection)
Northbound approach: (East Site Entrance) proposed one left-turn lane and one right-turn lane, stop-controlled
Eastbound approach: (Zion Church Road) existing one through lane, proposed one shared through/right-turn lane
Westbound approach: (Zion Church Road) existing one through lane, proposed one shared through/left-turn lane

2) Zion Church Road & West Site Entrance
Type of Control: proposed two-way stop-controlled (T-intersection)
Northbound approach: (West Site Entrance) proposed one left-turn lane and one right-turn lane, stop-controlled
Eastbound approach: (Zion Church Road) existing one through lane, proposed one shared through/right-turn lane
Westbound approach: (Zion Church Road) existing one through lane, proposed one shared through/left-turn lane

3) Zion Church Road & Johnson Road / Bayard Road
Type of Control: two-way stop-controlled
Northbound approach: (Johnson Road) one shared left/through/right-turn lane, stop controlled
Southbound approach: (Bayard Road) one shared left/through/right-turn lane, stop controlled
Eastbound approach: (Zion Church Road) one shared left/through/right-turn lane
Westbound approach: (Zion Church Road) one shared left/through/right-turn lane

4) Zion Church Road & Delaware Route 54
Type of Control: signalized four-leg intersection
Northbound approach: (Delaware Route 54) one left-turn lane, two through lanes, and one right-turn lane
Southbound approach: (Delaware Route 54) one left-turn lane, two through lanes, and one right-turn lane

Eastbound approach: (Zion Church Road) one left-turn lane, two through lanes, and one right-turn lane
Westbound approach: (Bayside Driveway) one left-turn lane, two through lanes, and one right-turn lane

5) Zion Church Road & Delaware Route 17
Type of Control: signalized four-leg intersection
Northbound approach: (Delaware Route 17) one shared left/through/right-turn lane
Southbound approach: (Delaware Route 17) one shared left/through/right-turn lane
Eastbound approach: (Zion Church Road) one shared left/through/right-turn lane
Westbound approach: (Zion Church Road) one shared through/left-turn lane and one right-turn lane

6) Delaware Route 54 & Johnson Road
Type of Control: two-way stop-controlled (T-intersection)
Southbound approach: (Johnson Road) one shared left/right-turn lane, stop-controlled
Eastbound approach: (Delaware Route 54) one shared through/left-turn lane
Westbound approach: (Delaware Route 54) one shared through/right-turn lane

7) Zion Church Road & Deer Run Road
Type of Control: two-way stop-controlled (T-intersection)
Northbound approach: (Deer Run Road) one shared left/right-turn lane, stop-controlled
Eastbound approach: (Zion Church Road) one shared through/right-turn lane
Westbound approach: (Zion Church Road) one shared through/left-turn lane

8) Delaware Route 17 & Bixler Road
Type of Control: two-way stop-controlled (T-intersection)
Northbound approach: (Delaware Route 17) one shared through/right-turn lane
Southbound approach: (Delaware Route 17) one shared through/left-turn lane
Westbound approach: (Bixler Road) one shared left/right-turn lane, stop-controlled

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: The Delaware Transit Corporation (DTC) currently does not offer any transit service near the study area.

Planned transit service: McCormick Taylor contacted Ms. Lisa Collins, a Service Development Planner for the DTC, via email on May 2, 2008 to determine whether DTC has any plans to extend the existing transit system in the vicinity of the development. No comments were received from DTC. However, included in the TIS was an October 26, 2007 email from Mr. David Dooley, a Service Development Planner for the DTC, stating that a transit route has been proposed along Delaware Route 54 from Selbyville to the beach, but this proposal has no funding and its eventual implementation is in doubt. Mr. Dooley also requested that Twin Cedars include sidewalks along the site frontage and connecting the site entrance to the development.

Existing bicycle and pedestrian facilities: According to the *Delaware Kent and Sussex Counties Bicycle Touring Map*, Bixler Road and Deer Run Road are both designated as having average cycling conditions with low traffic volumes (less than 2,000 ADT). Delaware Route 17 is designated as having above average cycling conditions with moderate traffic volumes (between 2,000 and 10,000 ADT). Johnson Road and Bayard Road are both designated as having above average cycling conditions with low traffic volumes, however there is a small portion of Johnson Road just south of Zion Church Road that has average cycling conditions with low traffic volumes. Zion Church Road and Delaware Route 54 are both designated as having average cycling conditions with moderate traffic volumes. There are currently no designated bicycle lanes or sidewalks along the site frontage on Zion Church Road.

Planned bicycle and pedestrian facilities: DelDOT's Bicycle and Pedestrian Facilities Team indicated, in a letter from Stephen Bayer dated November 9, 2007, that the following bicycle and pedestrian facilities should be required. In the letter, Mr. Bayer commented that Livable Delaware's updated State Strategies for Spending Map indicates the site is located in an Investment Level 4 area, where the existing transportation network should preserve the natural environment. However, if the development does occur, the following requests should be incorporated into the project to facilitate bicycle and pedestrian transportation:

a. 5' bike lanes should be added on both sides of Zion Church Road. At the proposed entrances on Zion Church Road, a 5' bike lane should be striped through any turn lanes and a right turn yield to bikes sign (MUTCD R4-4) should be added at the start of any right-turn lanes.
b. A 15' wide permanent easement should be dedicated to DelDOT for future instillation of multimodal facilities along all property frontages.
c. Internal sidewalks should be included with this development and should be constructed to extend to the entrance of this development.
d. Covered bike parking should be included near the commercial locations to be included with this development.

Mr. Bayer also indicated the State's Bicycle Map designates Zion Church Road as a bike route.

Previous Comments

All comments from DelDOT's Scoping Letter, Traffic Count Review and Preliminary TIS Review were addressed in the Final TIS submission.

General HCS Analysis Comments

(see table footnotes on the following pages for specific comments)

1) For future conditions at existing intersections, the TIS generally assumed heavy vehicle factors (HV) to be the same as existing HV and assumed no minimum HV. McCormick Taylor assumed the future HV to be either existing HV or 2%, whichever was greater.

2) For future conditions, the TIS (with a few minor exceptions) and McCormick Taylor assumed a peak hour factor (PHF) of either existing PHF or 0.88, whichever was greater, at all intersections.

3) The HCS analyses included in the TIS did not always reflect the lane widths observed in the field by McCormick Taylor. McCormick Taylor's HCS analyses incorporated the field-measured lane widths.
4) The TIS and McCormick Taylor used different cycle lengths and/or signal timing parameters when analyzing the signalized intersections in some cases.

5) The TIS input existing Right-Turn-on-Red (RTOR) volumes for some future analyses. Due to increased volumes and fewer available gaps, there would likely be fewer vehicles able to make right turns on red, so McCormick Taylor input no RTOR volumes for future conditions.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Unsignalized Intersection [1] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & East Site Entrance	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2012 with Twin Cedars (Case 3)						
Northbound Site Entrance	B (12.4)	C (16.8)	F (62.3)	B (12.4)	C (17.0)	F (63.5) [2]
Westbound Zion Church Road – Left	A (8.0)	A (8.6)	A (9.8)	A (8.0)	A (8.6)	A (9.8)
2012 with Twin Cedars (Case 3) *With Improvement Option 1* [3]						
Northbound Site Entrance	N/A	N/A	N/A	B (12.3)	C (16.2)	F (54.8) [2]
Westbound Zion Church Road – Left	N/A	N/A	N/A	A (8.0)	A (8.6)	A (9.8)

Signalized Intersection [1]	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & East Site Entrance	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2012 with Twin Cedars (Case 3) *With Improvement Option 1* [3]	N/A	N/A	N/A	A (0.27)	A (0.33)	A (0.51)

[1] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[2] The 95th percentile queue length for the northbound site entrance approach during the Case 3 Saturday peak hour is less than 5 vehicles.
[3] Improvement Option 1 includes the addition of an exclusive right-turn lane on the eastbound Zion Church Road approach and an exclusive left-turn lane on the westbound Zion Church Road approach. Both turn lanes are warranted by DelDOT's Standards and Regulations for Access to State Highways.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Unsignalized Intersection [4] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & West Site Entrance	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2012 with Twin Cedars (Case 3)						
Northbound Site Entrance	B (14.4)	C (16.1)	E (40.8)	B (13.1)	C (16.3)	E (41.7) [5]
Westbound Zion Church Road – Left	A (7.9)	A (8.5)	A (9.5)	A (7.9)	A (8.5)	A (9.5)
2012 with Twin Cedars (Case 3) *With Improvement Option 1* [6]						
Northbound Site Entrance	N/A	N/A	N/A	B (13.0)	C (15.8)	E (38.6) [5]
Westbound Zion Church Road – Left	N/A	N/A	N/A	A (7.9)	A (8.5)	A (9.5)

[4] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[5] The 95th percentile queue length for the northbound site entrance approach during the Case 3 Saturday peak hour is less than 3 vehicles.
[6] Improvement Option 1 includes the addition of an exclusive right-turn lane on the eastbound Zion Church Road approach and an exclusive left-turn lane on the westbound Zion Church Road approach. Both turn lanes are warranted by DelDOT's Standards and Regulations for Access to State Highways.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Unsignalized Intersection [7] **Two-Way Stop Control**	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & Johnson Road / Bayard Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)						
Northbound Johnson Road	B (12.5)	B (12.9)	C (18.8)	B (12.5)	B (12.9)	C (18.8)
Southbound Bayard Road	B (12.3)	B (13.8)	C (20.0)	B (12.3)	B (13.8)	C (20.0)
Eastbound Zion Church Road – Left	A (7.6)	A (7.6)	A (8.2)	A (7.6)	A (7.6)	A (8.2)
Westbound Zion Church Road – Left	A (7.5)	A (7.6)	A (8.0)	A (7.5)	A (7.6)	A (8.0)
2012 without Twin Cedars (Case 2)						
Northbound Johnson Road	C (21.2)	D (30.4)	F (105.9)	C (21.4)	D (30.4)	F (105.9) [8]
Southbound Bayard Road	E (42.6)	F (391.8)	F (1633)	E (43.6)	F (391.8) [9]	F (1659) [10]
Eastbound Zion Church Road – Left	A (8.5)	A (8.4)	A (9.4)	A (8.5)	A (8.4)	A (9.4)
Westbound Zion Church Road – Left	A (7.7)	A (8.1)	A (8.6)	A (7.7)	A (8.1)	A (8.6)
2012 with Twin Cedars (Case 3)						
Northbound Johnson Road	D (32.3)	F (71.7)	F (1131)	D (32.2)	F (71.7)	F (1168) [8]
Southbound Bayard Road	F (91.7)	F (682.8)	F (4707)	F (91.7)	F (682.8) [9]	F (4707) [10]
Eastbound Zion Church Road – Left	A (8.6)	A (8.6)	A (9.8)	A (8.6)	A (8.6)	A (9.9)
Westbound Zion Church Road – Left	A (7.8)	A (8.2)	A (8.8)	A (7.8)	A (8.2)	A (8.9)

Signalized Intersection [7]	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & Johnson Road / Bayard Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2012 with Twin Cedars (Case 3)	B (0.55)	C (0.71)	C (0.89)	B (0.59)	C (0.76)	C (0.88)

[7] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[8] The 95th percentile queue length for the northbound Johnson Road approach is approximately 5 vehicles during the Case 2 Saturday peak hour and approximately 15 vehicles during the Case 3 Saturday peak hour.
[9] The 95th percentile queue length for the southbound Bayard Road approach is approximately 25 vehicles during the Case 2 PM peak hour and approximately 34 vehicles during the Case 3 PM peak hour.
[10] The 95th percentile queue length for the southbound Bayard Road approach is approximately 38 vehicles during the Case 2 Saturday peak hour and approximately 49 vehicles during the Case 3 Saturday peak hour.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Signalized Intersection [11]	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & Delaware Route 54	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)	C (0.29)	C (0.29)	C (0.55)	C (0.36)	C (0.38)	C (0.55)
2012 without Twin Cedars (Case 2)	D (0.57)	C (0.60)	D (0.78)	D (0.51)	D (0.55)	D (0.82)
2012 with Twin Cedars (Case 3)	D (0.58)	C (0.62)	D (0.80)	D (0.53)	D (0.56)	D (0.84)

[11] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Signalized Intersection [12]	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & Delaware Route 17	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)	B (0.19)	B (0.27)	B (0.36)	B (0.20)	B (0.28)	B (0.35)
2012 without Twin Cedars (Case 2)	B (0.31)	B (0.47)	B (0.57)	B (0.31)	B (0.48)	B (0.58)
2012 with Twin Cedars (Case 3)	B (0.36)	B (0.53)	B (0.65)	B (0.34)	B (0.55)	B (0.67)

[12] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Unsignalized Intersection [13] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 54 & Johnson Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)						
Southbound Johnson Road	A (9.4)	A (9.7)	B (13.2)	A (9.3)	A (9.7)	B (13.3)
Eastbound Delaware Route 54 – Left	A (7.6)	A (7.6)	A (8.1)	A (7.5)	A (7.6)	A (8.1)
2012 without Twin Cedars (Case 2)						
Southbound Johnson Road	B (10.3)	B (10.6)	C (17.4)	B (10.3)	B (10.7)	C (17.4)
Eastbound Delaware Route 54 – Left	A (7.8)	A (8.0)	A (8.8)	A (7.8)	A (8.0)	A (8.8)
2012 with Twin Cedars (Case 3)						
Southbound Johnson Road	B (10.5)	B (10.8)	C (18.8)	B (10.5)	B (10.9)	C (18.8)
Eastbound Delaware Route 54 – Left	A (7.8)	A (8.0)	A (8.9)	A (7.8)	A (8.0)	A (8.9)

[13] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Unsignalized Intersection [14] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Zion Church Road & Deer Run Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)						
Northbound Deer Run Road	A (9.6)	A (9.9)	B (11.1)	A (9.6)	A (9.9)	B (11.2)
Westbound Zion Church Road – Left	A (7.6)	A (7.6)	A (8.0)	A (7.6)	A (7.6)	A (8.0)
2012 without Twin Cedars (Case 2)						
Northbound Deer Run Road	B (10.7)	B (12.1)	B (13.5)	B (10.7)	B (12.1)	B (13.5)
Westbound Zion Church Road – Left	A (7.8)	A (8.0)	A (8.5)	A (7.8)	A (8.0)	A (8.5)
2012 with Twin Cedars (Case 3)						
Northbound Deer Run Road	B (11.2)	B (13.3)	C (15.2)	B (11.2)	B (13.3)	C (15.3)
Westbound Zion Church Road – Left	A (7.9)	A (8.3)	A (8.9)	A (7.9)	A (8.3)	A (8.9)

[14] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 9
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Twin Cedars
Report dated April 18, 2008
Prepared by Orth-Rodgers & Associates, Inc.

Unsignalized Intersection [15] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 17 & Bixler Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)						
Southbound Delaware Route 17 – Left	A (7.5)	A (7.5)	A (7.5)	A (7.5)	A (7.5)	A (7.5)
Westbound Bixler Road	A (9.7)	B (10.5)	B (10.0)	A (9.7)	B (10.1)	B (10.1)
2012 without Twin Cedars (Case 2)						
Southbound Delaware Route 17 – Left	A (7.6)	A (7.5)	A (7.5)	A (7.6)	A (7.6)	A (7.5)
Westbound Bixler Road	A (9.7)	B (10.4)	B (10.1)	A (9.8)	B (10.4)	B (10.2)
2012 with Twin Cedars (Case 3)						
Southbound Delaware Route 17 – Left	A (7.6)	A (7.6)	A (7.5)	A (7.6)	A (7.6)	A (7.6)
Westbound Bixler Road	A (10.0)	B (10.6)	B (10.5)	A (10.0)	B (10.6)	B (10.6)

[15] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.