TIMMONS GROUP
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March 30, 2022

Chesterfield County Environmental Engineering
P.O. Box 40
Chesterfield, VA 23832

Re: Natural Resource Inventory
Various Component Analysis
Upper Magnolia Green – East (21SN0675)

Dear Environmental Engineering Staff,

Timmons Group has completed an analysis of several components as part of the Natural Resource Inventory Checklist in accordance with Section 19.1-542 of the Chesterfield County Zoning Ordinance for the proposed Upper Magnolia Green – East site (Site). The project area consists of approximately 700 acres and is located within the Swift Creek/Swift Creek Reservoir subwatershed in Chesterfield County, Virginia (See Table 1 and Figures 1-3).

Table 1: Parcel information within the project area from Chesterfield County GIS data.

GPIN	Physical Address	Project Acreage
PROJECT PARCELS		
6946757241	19801 DUVAL RD 23120	21.5
6956715448	18950 HULL STREET RD 23120	80.8
6976802507	18100 DUVAL RD 23120	524
ADDITIONAL PROJECT PARCELS		
7036848129	4361 MOSELEY RD 23120	68.4
7036854335	4355 MOSELEY RD 23120	5

The required Natural Resource Inventory components have been addressed through a combination of field investigations and careful desktop analyses and are discussed below.

Wetland Delineation and Resource Protection Area Determination

A wetland delineation of parcels controlled by the Economic Development Authority of Chesterfield County (GPINS 6946757241, 6956715448, 6976802507) was performed between August 2021 and January 2022 by Timmons Group personnel in accordance with the 1987 U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual and appropriate Regional Supplements. The limits of wetlands and waters on the eastern portions of parcel 6976802507 were confirmed by the USACE in a Jurisdictional Determination letter dated March 3, 2022 (Attachment 1).

On the remaining parcels (GPINS 7036848129, 7036854335), site access was not available until recently. Therefore, wetlands and waters were approximated using desktop evaluations of best available data (i.e. elevation, database wetlands, aerial, floodplain, slopes, soils, imagery signatures, etc.). A preliminary map showing the approximate size, shape, and location of jurisdictional features is included as Figure 4: Wetlands and Waters Map.

The limits of Resource Protection Areas (RPA) within the Economic Development Authority controlled parcels have been previously determined and confirmed, according to the Chesterfield County Environmental Engineering Department, under RPAD 610. For the remaining parcels, Timmons Group personnel conducted a perennial stream determination on February 10, 2022 utilizing field indicators as outlined in the North Carolina *Methodology for Identification of Intermittent and Perennial Streams and Their Origins, Version 4.11*. The limits of RPA were determined in these areas by placing a 100-foot buffer area along both sides of the identified perennial reaches and contiguous wetlands where appropriate and consistent with RPAD 610. A Resource Protection Area Determination (RPAD) request has been submitted to the County Environmental Engineering Department for the Additional Parcels and is under review as RPAD 1122. A preliminary map showing the approximate location of RPA buffer areas is included in Figure 4: Wetlands and Waters Map. A summary of overall wetlands, waters, and RPA feature geometries is provided in Table 2.

Table 2: Summary Totals of Wetlands, Waters, and RPAs Onsite

Feature Type	Acres	Linear Feet
Desktop Delineated Features		
Wetlands	4.6	
PER (R3)		760
Other Streams		1,301
Field Delineated Features (Confirmed 3/3/2022)		
PFO	19.2	
PEM	0.1	
PSS	0	
POW	0.14	
PER (R3)		2,188
INT (R4)		10,936
EPH (R6)		460
Field Delineated Features (Not confirmed)		
PFO	26.8	
PEM	0.1	
PSS	0	
POW	0	
PER (R3)		6,129
INT (R4)		7,030
EPH (R6)		2,266
Resource Protection Areas		
RPA	84.3	

100-Year Floodplain

Review of the Federal Emergency Management Agency (FEMA) mapping showed that the majority of the Site is located in Zone X, which is defined as an area outside of the 500-year floodplain and therefore is not located within a FEMA flood zone area. Areas identified as Zone AE occur along two USGS mapped stream channels onsite, Horsepen Creek and Blackman Creek. Zone AE is defined as an area subject to inundation by a 1% annual chance flooding event (Figure 5: FEMA Flood Zone Map).

Slopes Greater than 25%

A slope analysis was performed for the subject property and shows several areas with slopes greater than 25%. These slopes are almost entirely associated with topographic draws and drainage features extending off Horsepen Creek in the northern and central portions of the Site and Blackman Creek in the southern portion of the Site (Figure 6: Slope Analysis Map).

Hydrologic Soil Groups

Hydrologic soil groups are identified below and are shown on Figure 7: Hydrologic Soil Groups Map.

Table 3: Hydrologic soil groups on site as mapped by NRCS.

Map Unit Symbol	Map Unit Name	Rating	Acres in Study Area	Percent of Study Area
151B	Mayodan gravelly sandy loam, clayey substratum 2 to 6 percent slopes	B	3.0	0.43
1A	Fluvaquents	D	58.6	8.38
201C	Mayodan, clayey substratum-Creedmoor sandy loams, 6 to 12 percent slopes	B	164.2	23.47
201D	Mayodan, clayey substratum-Creedmoor sandy loams, 12 to 20 percent slopes	B	22.6	3.23
261B	Bourne-Colfax complex, 2 to 6 percent slopes	C	20.0	2.86
59B	Mayodan sandy loam, clayey substratum, 2 to 6 percent slopes	B	31.3	4.47
59C	Mayodan sandy loam, clayey substratum, 6 to 12 percent slopes	B	15.6	2.23
59D	Mayodan sandy loam, clayey substratum, 12 to 20 percent slopes	B	5.9	0.84
61B	Creedmoor fine sandy loam, 2 to 6 percent slopes	D	324.0	46.31
61C	Creedmoor fine sandy loam, 6 to 12 percent slopes	D	25.7	3.67
61C2	Creedmoor fine sandy loam, 6 to 12 percent slopes, eroded	D	7.3	1.04
68	Worsham fine sandy loam, 0 to 4 percent slopes	D	21.5	3.07

*Fluvaquents (1A) soils have been mapped as hydrologic soil groups “D” in Figure 7, at the request of the Chesterfield County Environmental Engineering Department.

Threatened and Endangered Species

The U.S. Fish & Wildlife Service Information, Planning, and Consultation System (IPaC), the Department of Wildlife Resources (DWR) Virginia Fish and Wildlife Information Service (VaFWIS) database, and the Department of Conservation and Recreation (DCR) Department of Natural Heritage (DNH) were reviewed to determine the potential for threatened and endangered (T&E)

species to occur onsite, within a 2-mile radius around the subject property, and within Chesterfield County in general (Attachment 2). The results indicate that there are no known occurrences of T&E species or critical habitats onsite. However, the Northern Long-eared Bat (NLEB) (federally and state threatened) was identified by IPaC as having the potential to be affected by activities within the surrounding area. Review of available U.S. Fish & Wildlife Service (USFWS) and Virginia Department of Wildlife Resources (DWR) data indicates that there are no known NLEB winter hibernacula/maternity roosts within the vicinity of the Site. Therefore, the proposed project should not result in any unauthorized take of NLEB per the USFWS Final 4(d) Rule.

The nearest Bald Eagle nests as shown by the Center for Conservation Biology Mapping are located approximately 8,000 feet (1.5 miles) east and 9,500 feet (1.8 miles) northeast of the project area.

Transactions Screen - Hazardous Materials

A computer regulatory database search was completed using Environmental Risk Information Services (ERIS) and reviewed to identify current and/or past uses of the Upper Magnolia Green – East Site and surrounding properties that may have resulted in and/or could pose a material threat of a release of hazardous materials, resulting in a potential impact to the surrounding environment.

According to the ERIS Database Report (Attachment 3), no records are found within the subject property. Three (3) records were identified within a 0.50-mile radius of the Site at higher topographic elevations. All identified records are leaking storage tanks (LST) with closed case statuses. Two (Map Key 3) are located at Grange Elementary School 0.35 miles south of the Site and have closed case statuses as of May 1, 1991 and August 25, 1994. One (Map Key 4) is located at 8309 Beaver Bridge Road 0.37 miles south of the Site and has a closed case status as of September 18, 2001. All listings located farther than 0.50 miles from the Site or listings that are located at lower topographic elevations in relation to the Site are not considered to present potential risks to the project area.

During site visits, a minimal volume of miscellaneous solid waste material was observed across the Site consisting primarily of tires, bottles, cans, paper goods, scrap metal, and Styrofoam. This discarded solid waste was primarily observed at points of access and near internal logging roads/paths. While some of the materials may have specific non-hazardous disposal requirements, the extent of observed onsite material would likely be considered a de minimis condition.

Greenways

Based on the DCR Virginia Outdoors Plan Mapper, the project area is not located in the vicinity of any greenways (Attachment 4: DCR Virginia Outdoors Plan Mapper).

Abandoned or Existing Mines or Quarries

No known abandoned or existing mines or quarries are present on or near the project area. See Attachment 5: Department of Mines, Minerals, and Energy Database Results.

Cultural Resources

According to the Virginia Department of Historic Resources (DHR) Cultural Resources Information System (V-CRIS), there are three cultural resources located offsite within a 0.25-mile radius surrounding the Site. Two architectural resources were identified offsite (DHR IDs: 020-0043, 020-0334) and consist of late 18th and early 19th century single-family dwellings. Resource 020-0043 also encompasses a family cemetery with several headstones. Neither resource has been formally evaluated by DHR Staff. One archaeological resource (44CF0700) was identified offsite within a 0.25-mile radius surrounding the Site and has been deemed "Not Eligible" by DHR Staff for listing in the NRHP or VLR. The locations of these resources are detailed in Attachment 6: DHR V-CRIS Search Results.

Vegetation Summary

Timmons Group reviewed the vegetative condition of the Site in conjunction with the onsite wetland delineation and field efforts. The Site is dominated by mature mixed pine-hardwood forest. Surface waters onsite are drained offsite in multiple directions by three main waterways: northeast by tributaries of Otterdale Branch, and east by Horsepen Creek and Blackman Creek.

The dominant vegetation within the tree stratum in wetland areas onsite was generally comprised of shallow-rooting white oak (*Quercus alba*), willow oak (*Quercus phellos*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and loblolly pine (*Pinus taeda*). The dominant sapling vegetation within jurisdictional areas included ironwood (*Carpinus caroliniana*), sweetgum, red maple, and American holly (*Ilex opaca*). The shrub stratum within jurisdictional areas was dominated by several types of blueberry and huckleberry, namely blue huckleberry (*Gaylussacia frondosa*), hybrid blueberry (*Vaccinium X marianum*), black highbush blueberry (*Vaccinium fuscatum*), and southern highbush blueberry (*Vaccinium formosum*). Herbaceous vegetation within jurisdictional areas was dominated by cinnamon fern (*Osmundastrum cinnamomeum*), netted chain fern (*Woodwardia areolata*), sweet wood-reed (*Cinna arundinacea*), slender fimbry (*Fimbristylis autumnalis*), and various *Carex* species. Where present, the vine stratum was dominated by greenbrier (*Smilax rotundifolia*) and muscadine (*Vitis rotundifolia*).

Upland (non-jurisdictional) slopes and hilltops onsite were comprised primarily of loblolly pine and a diversity of oak species, with varied shrub species and little herbaceous vegetation. The tree and sapling strata in these areas were dominated by loblolly pine, northern white oak, northern red oak (*Quercus rubra*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), and blackjack oak (*Quercus marilandica*). The shrub stratum within these areas was generally dominated by blue huckleberry, early lowbush blueberry (*Vaccinium pallidum*), deerberry (*Vaccinium stamineum*), and black huckleberry (*Gaylussacia baccata*); occasionally, these areas were dominated by hybrid blueberry and black blueberry. These areas often had low diversity and density of herbaceous vegetation. Where present, the herbaceous stratum was primarily comprised of Christmas fern (*Polystichum acrostichoides*) and eastern woodland sedge (*Carex blanda*). The vine stratum was also less common, but where present was dominated by greenbrier and muscadine.

Upland floodplains were generally comprised of American beech (*Fagus grandifolia*), red maple, ironwood, pignut hickory (*Carya glabra*), and American holly in the tree and sapling strata. These areas tended to have more densely populated herbaceous vegetation and more sparsely populated shrubs than the hilltops and slopes. Where present, the shrub stratum within these areas onsite was dominated by blue huckleberry, black highbush blueberry, hybrid blueberry, and

black huckleberry. Herbaceous vegetation in these areas was dominated by Christmas fern, varied *Carex* species, namely eastern woodland sedge and white-tinge sedge (*Carex albicans*), slender fimbry, and slender wood-oats (*Chasmanthium laxum*). Where present, the vine stratum was dominated by greenbrier and muscadine.

Highly Erodible Soils

Erodible soil groups are identified below and shown on Figure 3: Environmental Inventory Map.

Table 4: Highly erodible soils as mapped on site by NRCS.

Map Unit Symbol	Map Unit Name	Rating	Component Name (Percent)	Acres in Study Area	Percent of Study Area
151B	Mayodan gravelly sandy loam, clayey substratum 2 to 6 percent slopes	Slight	Mayodan (85%)	3.0	0.43
1A	Fluvaquents	Slight	Fluvaquents (85%)	58.6	8.38
201C	Mayodan, clayey substratum-Creedmoor sandy loams, 6 to 12 percent slopes	Severe	Mayodan (40%) Creedmoor (30%)	164.2	23.47
201D	Mayodan, clayey substratum-Creedmoor sandy loams, 12 to 20 percent slopes	Severe	Mayodan (40%) Creedmoor (30%)	22.6	3.23
261B	Bourne-Colfax complex, 2 to 6 percent slopes	Moderate	Bourne (45%) Colfax (40%)	20.0	2.86
59B	Mayodan sandy loam, clayey substratum, 2 to 6 percent slopes	Moderate	Mayodan (85%)	31.3	4.47
59C	Mayodan sandy loam, clayey substratum, 6 to 12 percent slopes	Severe	Mayodan (85%)	15.6	2.23
59D	Mayodan sandy loam, clayey substratum, 12 to 20 percent slopes	Severe	Mayodan (85%)	5.9	0.84
61B	Creedmoor fine sandy loam, 2 to 6 percent slopes	Moderate	Creedmoor (85%)	324.0	46.31
61C	Creedmoor fine sandy loam, 6 to 12 percent slopes	Severe	Creedmoor (85%)	25.7	3.67
61C2	Creedmoor fine sandy loam, 6 to 12 percent slopes, eroded	Severe	Creedmoor (85%)	7.3	1.04
68	Worsham fine sandy loam, 0 to 4 percent slopes	Slight	Worsham (85%)	21.5	3.07

K Factor (whole soil)

The K factors for onsite soil groups are detailed below and can be seen on Figure 3: Environmental Inventory Map.

Table 5: Soil group K Factor as mapped on site by NRCS.

Map Unit Symbol	Map Unit Name	Rating
151B	Mayodan gravelly sandy loam, clayey substratum 2 to 6 percent slopes	0.19
1A	Fluvaquents	0.36
201C	Mayodan, clayey substratum-Creedmoor sandy loams, 6 to 12 percent slopes	0.24
201D	Mayodan, clayey substratum-Creedmoor sandy loams, 12 to 20 percent slopes	0.24
261B	Bourne-Colfax complex, 2 to 6 percent slopes	0.25
59B	Mayodan sandy loam, clayey substratum, 2 to 6 percent slopes	0.19
59C	Mayodan sandy loam, clayey substratum, 6 to 12 percent slopes	0.19
59D	Mayodan sandy loam, clayey substratum, 12 to 20 percent slopes	0.19
61B	Creedmoor fine sandy loam, 2 to 6 percent slopes	0.30
61C	Creedmoor fine sandy loam, 6 to 12 percent slopes	0.30
61C2	Creedmoor fine sandy loam, 6 to 12 percent slopes, eroded	0.30
68	Worsham fine sandy loam, 0 to 4 percent slopes	0.27

Other Potentially Sensitive Environmental Factors

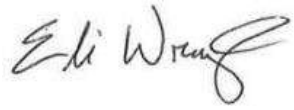
No other potentially sensitive environmental features were identified within the proposed Upper Magnolia Green - East site.

Results

Timmons Group completed analyses for the following components: wetland delineation & RPA assessment, 100-year floodplains, steep slopes, erodibility, hydrologic soil groups, threatened and endangered species, hazardous materials, greenways, abandoned or existing mines or quarries, historic/archeological/cultural features, and assessed the presence of other potentially sensitive environmental features.

Please contact Eli Wright at (804) 200-6582 or eli.wright@timmons.com if you have any questions or comments regarding the methods of completion or data presented for the Natural Resource Inventory Checklist.

Sincerely,
Timmons Group



Eli Wright, PWS, PWD
Senior Environmental Scientist

Legend

Desktop Delineated Features

Field Delineated Features

Transaction Screen - Database Results

Threatened and Endagered Species

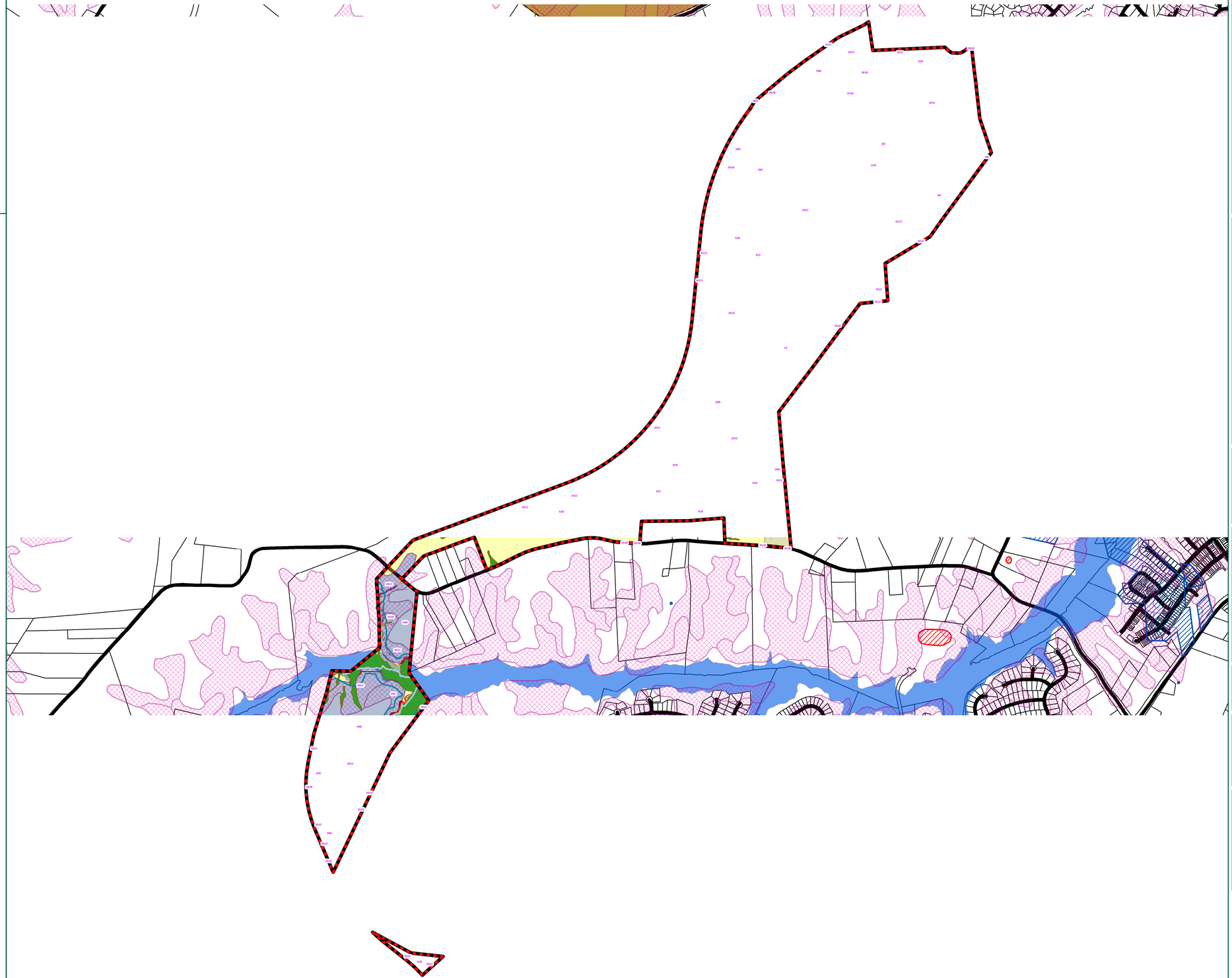
Abandoned or Existing Mines/Quarries

Flood Hazard

Hydrologic Soil Group - Dominant Condition

Potential Soil Erosion Hazard

Slope Percentage



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PROJECT NAME & LOCATION

UPPER MAGNOLIA GREEN - EAST (21SN0675)

DATE

PROJECT NUMBER

PROJECT NAME

DESIGNED BY / DRAWN BY

REVISIONS

DRAWING DESCRIPTION

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE

SHEET NUMBER