

Natural Conservation Area Analysis for the Elwyn Tract Middletown Township, Delaware County, Pennsylvania



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Prepared for:

**Middletown Township Land Conservancy
&
Chester-Ridley-Crum Watersheds Association**

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INTRODUCTION

The Elwyn Tract, also known as Mineral Hill, is a 79-acre site at the intersection of U.S. 1 and Baltimore Pike in Middletown Township, Delaware County, Pennsylvania. It has been owned for many years by the nonprofit institution now known as Elwyn, Inc., which used the property for a summer camp scouting facility. During the nineteenth century parts of the northern section of the property were used for agriculture and quarrying. The tract is generally heavily wooded, especially in the considerable areas of moderately and very steep slopes. It also exhibits a rich concentration of streams and wetlands. The site, with its valuable yet sensitive features, remains as a natural island in a heavily developed watershed. The property is immediately adjacent to Ridley Creek (designated High Quality Waters) and just upstream from a major public drinking water intake. Due to the sensitive nature of the site and its extensive natural resources, this Natural Conservation Area Analysis was performed at the request of the Middletown Township Land Conservancy and the Chester-Ridley-Crum Watersheds Association to identify priority areas of the site that should be protected, if other areas were to be developed.

LEGAL BACKGROUND

Any plans to develop this sensitive site must meet state and federal environmental laws designed to protect the water quality of wetlands and streams. These laws include the federal Clean Water Act and associated federal regulations, the Pennsylvania Clean Streams Law, the Pennsylvania Stormwater Management Act, the Pennsylvania Dam Safety and Encroachments Act, Pennsylvania's Water Quality Standards and other state regulations governing wetland and stream encroachments, permitting of stormwater discharges, and erosion and sediment pollution control.

These laws and regulations require a developer to obtain permits for stormwater discharges and wetland and stream encroachments prior to developing a property. In order to obtain such permits, as a general rule, a developer must minimize environmental impacts and protect water quality. Where waters are of excellent existing quality (High Quality or Exceptional Value), the legal requirement to protect and maintain water quality is even greater. On such a site, depending on circumstances, this generally means that buffers around streams and wetlands must be protected, disturbance of steep slopes must be minimized and mature forest cover must be largely protected. Such is the case with the Elwyn Tract/Mineral Hill.

The federal and state legal requirements protecting wetlands and streams in Pennsylvania do not establish precise conservation areas on a property. Rather, it is left to the developer to design a development project that is protective enough of water quality and the environment that it can be permitted. There is however, plenty of scientifically-based professional guidance available that allow a site planner to determine and delineate conservation areas on a property. The conservation areas established in this report draw from such guidance, particularly those recommendations and regulations which are applicable in similar settings, including: New Jersey's Category 1 Waters requirements, Georgia's water supply watersheds

requirements, the Chesapeake Bay Riparian Handbook, the draft Pennsylvania Stormwater BMP Manual, Baltimore County, and local ordinances (Middletown, Kennett, Horsham, Upper Salford, Lower Merion, and East Nantmeal Townships as well as Delaware County).

CONSERVATION AREAS

The conservation areas are based on a thorough review of local and regional regulations, site-specific conditions, and the watershed context. The extents were developed in order to be environmentally protective yet also practically achievable. This approach also follows PA Department of Conservation and Natural Resources' (DCNR) *Growing Greener Program* (not to be confused with the Growing Greener grant program administered by PADEP). These conservation areas and the Conservation Area Maps are also consistent with the Ridley Creek Conservation Plan which recommends that "The steep wooded portion of the property owned by Elwyn Institute close to the creek should be set aside permanently." (Page 44)

Primary conservation areas for this site consist of streams, zone one of riparian buffers, wetlands, wetland buffers, very steep slopes (greater than 25 percent), and the coincidence of multiple secondary conservation areas. Secondary conservation areas include moderately steep slopes (15 to 25 percent), zone two of riparian buffers, contiguous woodlands, individual specimen trees, and special areas such as mineral collection sites, threatened plant locations, and areas with a high potential for prehistoric resources. Table 1 lists conservation areas, their recommended extents, and the disturbance that is allowed within each. Table 2 lists the approximate amount of conservation areas found on the site. A sample of related conservation regulations and guidance is shown in Table 3.

Table 1. Conservation Area Descriptions

Conservation Area	Extent	Allowable Disturbance
Streams	Top of Bank	None
Riparian Buffer, Zone 1	100 feet from stream banks in all directions	None, except for restoration or small recreational elements (paths, etc.)
Wetlands	As delineated by USCOE and Schmid & Co.	None
Wetlands Buffer	50 feet from wetland boundaries in all directions	None, except for restoration or small recreational elements (paths, etc.)
Very Steep Slopes (greater than 25%)	As defined by topographic survey	5% of total extent for utility crossings, grade transitions, etc.
Moderately Steep Slopes (15 to 25%)	As defined by topographic survey	25% of total extent
Riparian Buffer, Zone 2	50 feet from the boundary of Zone 1 in all directions	Minor grading, utility crossings, changes for proposed pervious areas, 25% maximum disturbance
Contiguous Woodland	Treeline, as surveyed	50% maximum, tree replacement for all tree removal beyond 10%
Individual Specimen Trees	Unknown	Minimum practicable disturbance to area extending 10 ft. beyond driplines
Special Areas – Mineral Collections Sites, Threatened Species, Pre-historical, etc.	Not fully known, mineral sites primarily along tributaries	Minimum practicable disturbance
Coincidence of Multiple Conservation Areas	Areas with multiple secondary areas – as shown	None, except for restoration or small recreational elements (paths, etc.)

POTENTIAL DEVELOPABLE AREAS

The enclosed “Most Sensitive & Special Value Areas” map shows the primary conservation areas and zone two of the riparian buffers (since very little, if any, disturbance should occur in these areas). As can be seen, considerable portion of the property is situated outside these Most Sensitive areas such that approximately 24 acres of the site may be suitable for development undertaken with special care given the sensitive site and watershed context. As shown in the enclosed “Sensitive & Special Value Areas” map, much of these 24 acres is still covered by multiple valuable and sensitive features such as woodland and moderately steep slopes. Any disturbance to these secondary conservation areas should be minimized as much as possible with a maximum disturbance as shown in Table 1. These conclusions agree with the recommendations in the township comprehensive plan, namely for “green areas” and “existing and proposed low to medium intensity development” on the site (quotations from Delaware County Planning Commission review letter dated 8/15/02). Not surprisingly, these upland areas are also where the majority of the previous development and clearing have occurred. If new development were to occur in these areas, it must be done in a way to protect and sustain the extensive natural resources contained in the remaining conservation areas and the quality of Ridley Creek and its tributaries.

Especially critical is comprehensive stormwater management – managing volume, peak rate, pollutants, and erosion while maintaining groundwater recharge and excellent water quality. Groundwater recharge must be well distributed in the good upland soils to preserve the various wetlands and tributaries that depend on cool, clean baseflow. All Antidegradation requirements of Pennsylvania’s Water Quality Standards, the Department of Environmental Protection’s Comprehensive Stormwater Policy, and the draft Pennsylvania Stormwater Best Management Practices (BMP) Manual, as well as state and local erosion and sedimentation control guidelines should be followed rigorously. Conservation Design – also known as Low Impact Development – and non-structural BMPs should be used as much as possible. As stated in this report, any development proposed for this site must protect and maintain the water quality of Ridley Creek and its tributaries in order for stormwater discharge permits to be issued. Thus stormwater management and planning techniques such as those just discussed, which conserve natural soils and vegetation and strive to replicate the natural water cycle, are critical to overcoming the environmental challenges presented by this site.

Table 2. Approximate Amount of Conservation Areas on Elwyn Tract

Conservation Area	Approximate Area on Elwyn Tract (acres)
Riparian Buffer, Zone 1	30.0
Very Steep Slopes (greater than 25%)	10.6
Wetlands and Wetlands Buffer	14.6
Coincidence of Multiple Secondary Areas	8.1
Riparian Buffer, Zone 2	9.3
Moderately Steep Slopes (15 to 25%)	22.7
Woodland	73.3
Approx. Total Area Unsuitable for Development (not including overlaps)**	54.6

*** Calculated by summing all primary conservation areas, zone two of the riparian buffers, and the minimum protected area of moderately steep slopes (75% of 22.7 acres), but not counting any given area of the site more than once.*

Table 3. Sample of Related Conservation Regulations and Guidance

	Regulation	Pertains To...	Source
RIPARIAN BUFFERS	"300-foot special resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards, or from the centerline of the waterway..."	Category One (NJAC 7:9B), and perennial or intermittent streams that drain into or upstream of of the C1 waters	New Jersey , <i>STORMWATER MANAGEMENT RULE: N.J.A.C. 7:8</i> http://www.nj.gov/dep/rules/adoptions/2004_0202_water_shed.pdf
	"applicant shall create a riparian buffer extending a minimum of fifty (50) feet to either side of the top of the bank of the channel"	Perennial or intermittent streams	Middletown Township, <i>Subdivision and Land Development Ordinance</i> , dated 7/26/04 http://www.middletowntownship.org
	"All water supply watersheds must provide 100ft buffers from the stream banks of all tributaries within a 7 mile radius of a water intake. Also required is a 150ft impervious surface setback... "	Water supply tributaries	Georgia, <i>Georgia Planning Act Minimum Standards of 1983 (O.C.G.A. 12-2-8)</i> , http://rules.sos.state.ga.us/docs/391/3/16/01.pdf
	"...forest buffer should be the greater of the following (1) 100 ft , (2) 25 ft from the outer wetland boundary , (3) 25 ft from the 100-year floodplain reservation or easement boundary... "	III,III-P,IV, or TV-P stream	Baltimore County, MD, <i>Buffer Protection and Management Ordinance</i> , http://www.epa.gov/owow/nps/ordinance/documents/A2a-Baltimore.pdf
	"The most commonly approved minimum buffer widths for water quality and habitat maintenance are 35-100 feet."	All	Pennsylvania, <i>Pennsylvania Stormwater Management Manual (Draft 2005)</i> , http://www.dep.state.pa.us/dep/subject/advoun/Stormwater/stormwatercomm.htm
	"no woodland or other land disturbance shall be permitted within Zone 1 Riparian buffer "	All	Kennett Township, Chester County, PA, <i>Natural Resources Protection Ordinance</i> , http://www.dvrpc.org/planning/community/ProtectionTools/Ordinances/Wetlands_Kennett.pdf
	"... minimum 75' from each defined edge of an identified watercourse...or shall equal the extent of the 100-year floodplain, which ever is greater."	All	Horsham and Upper Salford Townships, Montgomery County, PA, <i>Stream Corridor Protection Ordinance</i> , http://www.dvrpc.org/planning/community/ProtectionTools/Ordinances/Stream_Corridor_Horsham.pdf
	"A minimum width of 75 to 100 feet is recommended to provide effective stream protection."	All	Palone, R.S. and A.H. Todd (eds.) 1997. Chesapeake Bay Riparian Handbook. USDA Forest Service. NA-TP-02-97. Radnor, PA. http://www.chesapeakebay.net/pubs/subcommittee/ncs/forest
WETLAND BUFFERS	"The width of the transition area shall be determined by the department as follows: (1) No greater than 150 feet nor less than 75 feet for a freshwater wetland of exceptional resource value ; (2) No greater than 50 nor less than 25 feet for a freshwater wetland of intermediate resource value "	Freshwater wetlands of exceptional and intermediate resource value	New Jersey, <i>New Jersey DEP Freshwater Wetlands Protection Act</i> , http://www.state.nj.us/dep/landuse/7-7a.pdf
	100 ft buffer for freshwater wetlands	Freshwater wetlands (over 12.4 acres or any smaller wetlands determined to be of unusual importance)	New York, <i>Freshwater Wetlands Act</i> , http://www.dec.state.ny.us/website/dfwmr/habitat/fwwprog4.htm#Regulations
	25 ft buffer	Freshwater wetlands	Maryland, <i>Maryland Non-tidal Wetlands Act</i> , www.emdot.com/WaterQuality/Wetlands%20Protection.doc
STEEP SLOPES	"No more than 30% of moderately steep slopes shall be regraded, built upon, or otherwise altered or disturbed"	Moderately steep slopes	Kennett Township, Chester County, PA, <i>Natural Resources Protection Ordinance</i> , http://www.dvrpc.org/planning/community/ProtectionTools/Ordinances/Wetlands_Kennett.pdf
	"No more than 15% of very steep slopes shall be regraded, built upon, or otherwise altered or disturbed"	Very steep slopes	
	disturbance limit 30%	Slopes 15%-20%	Upper Salford Township, Montgomery County, PA, <i>Steep Slope Ordinance</i> , http://www.dvrpc.org/planning/community/ProtectionTools/Ordinances/Steep_Slope_Upper_Salford.pdf
	disturbance limit 20%	Slopes 20%-25%	
	disturbance limit 10%	Slopes 25%-30%	
	disturbance limit 5%	Slopes >30%	

AUTHORS

Cahill Associates, Inc. (CAI) is an environmental consulting firm specializing in Water Resources Management, Environmental Planning, and Sustainable Site Design. CAI is committed to managing and sustaining our valuable land and water resources while meeting the increasingly demanding needs of society. CAI's professional staff includes environmental, civil and water resources engineers, planners, scientists, and computer experts.

CAI has been performing environmental studies, water resources projects, and sustainable development designs throughout the U.S. since 1974. A fundamental challenge in this work is to balance the human uses of land and water resources so that we live within the sustainable limits of the natural systems. Some of our recent work includes the preparation of the draft Pennsylvania Stormwater BMP Manual for the PA Department of Environmental Protection, the Darby Creek Watershed River Conservation Plan, the Radnor Township Comprehensive Plan Update, and the Technical BMP Manual & Infiltration Feasibility Report for Little Lehigh Creek. Some of our latest stormwater management systems were designed for Kaiser Permanente Hospitals, University of North Carolina, Ford Motor Company, City of Wilmington (DE), University of Pennsylvania, Philadelphia Water Department and Pennsylvania Horticultural Society, U.S. National Fish & Wildlife Service, Swarthmore College, U.S. Forest Service, Washington National Cathedral, Pennsylvania State University, Delaware County Community College, Radnor Township, and the Port of Portland (OR).

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Citizens for Pennsylvania’s Future (PennFuture) is a Pennsylvania public interest membership organization dedicated to creating a just future where the environment, communities and the economy thrive. PennFuture enforces environmental laws and advocates for the transformation of public policy, public opinion and the marketplace to restore and protect the environment and safeguard public health. PennFuture advances effective solutions to environmental and quality of life problems. According to the Philadelphia Inquirer, PennFuture is Pennsylvania’s leading environmental organization.

Matthew B. Royer, Staff Attorney – an environmental attorney and a graduate of Dartmouth College (B.A. Biology, 1993) and Duke University School of Law (J.D. 1996). Mr. Royer heads PennFuture’s watershed program, which provides legal outreach, education and representation to watershed groups, land conservancies and other organizations and individuals engaged in grassroots efforts to protect local watersheds. He serves on the steering committee for the Pennsylvania Campaign for Clean Water, a coalition of over 100 organizations dedicated to protecting the Commonwealth’s water resources. Prior to joining PennFuture, Mr. Royer worked as an attorney in the Pennsylvania Department of Environmental Protection’s Southcentral Regional Office, where he counseled the mining and waste management programs. He is the author of PennFuture’s Stream Redesignation Handbook and a frequent lecturer on water quality law and policy.





