



DRAFT ENVIRONMENTAL IMPACT EVALUATION

HEBRON VILLAGE GREEN DISTRICT

HORTON PROPERTY

Hebron, Connecticut

NLJA # 0916-0002

April 4, 2005

Sponsor Agency:
Department of Economic and Community Development

Small Town Economic Assistance Program (STEAP)

Prepared by:
Nathan L. Jacobson & Associates, Inc.
86 Main Street
P O. Box 337
Chester, Connecticut 06412-0337

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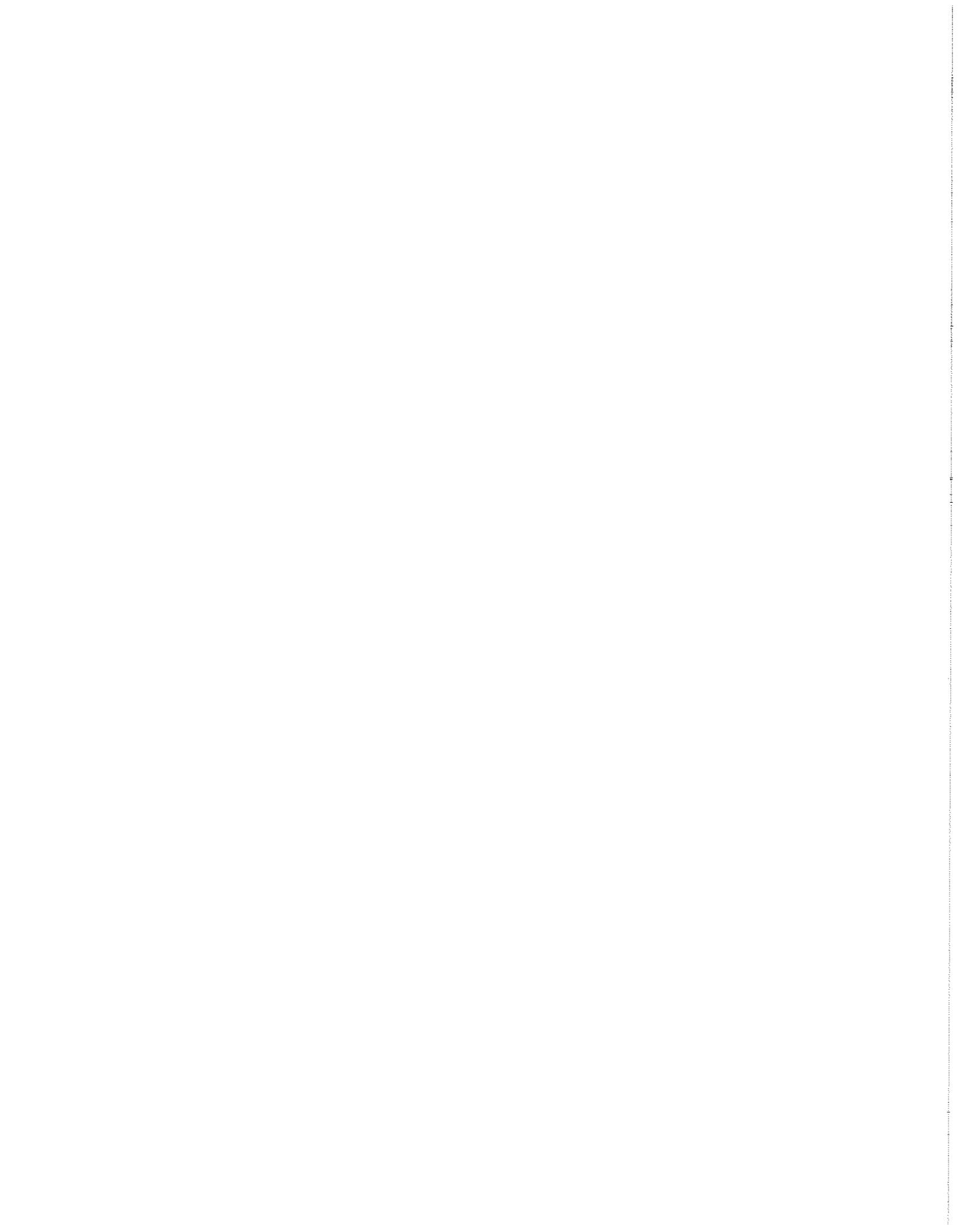


TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY..... 1-1

1.1 PROPOSED VILLAGE GREEN DISTRICT 1-1

1.2 ALTERNATIVES ANALYSIS..... 1-1

1.3 SUMMARY OF POTENTIAL IMPACTS 1-1

1.3.1 LAND USE AND ZONING 1-1

1.3.2 SOCIOECONOMICS 1-2

1.3.3 FARMLAND SOIL RESOURCES 1-2

1.3.4 HISTORIC AND ARCHEOLOGICAL RESOURCES 1-3

1.3.5 AESTHETIC AND VISUAL RESOURCES 1-3

1.3.6 CULTURAL AND HERITAGE RESOURCES 1-3

1.3.7 COMMUNITY, INSTITUTIONAL, & RECREATIONAL FACILITIES AND SERVICES 1-3

1.3.8 AIR QUALITY 1-3

1.3.9 NOISE 1-4

1.3.10 WATER QUALITY AND RESOURCES 1-4

1.3.11 NATURAL LAND RESOURCES AND FORMATIONS 1-5

1.3.12 BIOLOGICAL ENVIRONMENT 1-5

1.3.13 FLOOD HAZARD POTENTIAL 1-5

1.3.14 PESTICIDES, SOLID WASTE, RECYCLABLES, AND HAZARDOUS WASTE 1-5

1.3.15 TRAFFIC AND ROADWAY NETWORK 1-6

1.3.16 PUBLIC UTILITIES AND SERVICES 1-6

1.3.17 HAZARDS TO HUMAN HEALTH OR SAFETY 1-7

1.4 CONCLUSION 1-7

2.0 PROJECT BACKGROUND..... 2-1

2.1 INTRODUCTION 2-1

2.2 THE CEPA PROCESS 2-5

2.3 DESCRIPTION OF THE PROPOSED ACTION 2-7

2.4 PURPOSE AND NEED 2-9

2.5 RELATIONSHIP TO OTHER DOCUMENTS 2-9

3.0 ALTERNATIVES ANALYSIS..... 3-1

3.1 ALTERNATIVES CONSIDERED 3-1

3.2 NO ACTION ALTERNATIVE 3-1

3.3 PREFERRED ALTERNATIVE 3-2

4.0 EXISTING ENVIRONMENT AND ANALYSIS OF IMPACT..... 4-1

4.1 LAND USE AND ZONING 4-1

4.1.1 STATEWIDE LAND USE CONSERVATION AND DEVELOPMENT 4-1

4.1.2 CAPITOL REGION LAND USE PLAN 4-3

4.1.3 MUNICIPAL PLAN OF DEVELOPMENT 4-5

4.1.4 LAND USES IN THE PROJECT VICINITY 4-6

4.1.5 ANALYSIS OF LAND USE AND ZONING IMPACT 4-6

4.2 SOCIOECONOMICS 4-9

4.2.1 DEMOGRAPHICS 4-9

4.2.2	NEIGHBORHOOD	4-9
4.2.3	EMPLOYMENT	4-10
4.2.4	ANALYSIS OF IMPACT ON SOCIOECONOMICS	4-10
4.3	FARMLAND SOIL RESOURCES	4-11
4.3.1	BACKGROUND	4-11
4.3.2	ANALYSIS OF IMPACT ON SOIL RESOURCES	4-11
4.4	HISTORIC AND ARCHEOLOGICAL RESOURCES	4-13
4.4.1	BACKGROUND	4-13
4.4.2	ANALYSIS OF IMPACT ON HISTORIC AND ARCHEOLOGICAL RESOURCES	4-14
4.5	AESTHETIC AND VISUAL RESOURCES	4-17
4.5.1	EXISTING DEVELOPMENT PATTERNS	4-17
4.5.2	SITE AND BUILDING DESIGN	4-17
4.5.3	COMPATIBILITY WITH NEIGHBORHOOD	4-17
4.5.4	AESTHETIC AND VISUAL RESOURCES MITIGATION	4-18
4.6	CULTURAL AND HERITAGE RESOURCES	4-19
4.6.1	NEW ENGLAND VILLAGE ATMOSPHERE	4-19
4.6.2	CULTURAL AND HERITAGE RESOURCE MITIGATION	4-19
4.7	COMMUNITY, INSTITUTIONAL, & RECREATIONAL FACILITIES AND SERVICES	4-21
4.7.1	EXISTING PUBLIC SAFETY AND EMERGENCY SERVICES AND IMPACT	4-21
4.7.2	EXISTING PUBLIC WORKS DEPARTMENT AND IMPACT	4-22
4.7.3	EXISTING EDUCATIONAL RESOURCES AND IMPACT	4-22
4.7.4	EXISTING RECREATIONAL RESOURCES AND IMPACT	4-23
4.7.5	EXISTING ANCILLARY BUSINESS AND IMPACT	4-23
4.8	AIR QUALITY	4-25
4.8.1	EXISTING ENVIRONMENT	4-25
4.8.2	ANALYSIS OF IMPACT ON AIR QUALITY	4-25
4.9	NOISE	4-27
4.9.1	EXISTING ENVIRONMENT	4-27
4.9.2	ANALYSIS OF NOISE IMPACT	4-28
4.10	WATER QUALITY AND RESOURCES	4-29
4.10.1	STORMWATER	4-29
4.10.2	SURFACE WATER RESOURCES	4-30
4.10.3	GROUNDWATER RESOURCES	4-32
4.10.4	ANALYSIS OF IMPACT ON WATER QUALITY AND RESOURCES	4-32
4.11	NATURAL LAND RESOURCES AND FORMATIONS	4-35
4.11.1	COMPATIBILITY WITH NATURAL RESOURCES	4-35
4.11.2	TOPOGRAPHY	4-35
4.11.3	BEDROCK GEOLOGY	4-35
4.11.4	SURFICIAL GEOLOGY	4-36
4.11.5	ANALYSIS OF IMPACT	4-36
4.12	BIOLOGICAL ENVIRONMENT	4-37
4.12.1	VEGETATION	4-37
4.12.2	ANALYSIS OF VEGETATION IMPACT	4-40
4.12.3	INLAND WETLANDS	4-40
4.12.4	ANALYSIS OF INLAND WETLANDS IMPACT	4-41
4.12.5	FISH AND WILDLIFE HABITAT	4-42
4.12.6	ANALYSIS OF FISH AND WILDLIFE HABITAT IMPACT	4-43
4.12.7	SPECIES OF SPECIAL CONCERN	4-44
4.12.8	ANALYSIS OF SPECIES OF SPECIAL CONCERN IMPACT	4-44
4.13	FLOOD HAZARD POTENTIAL	4-47
4.13.1	EXISTING ENVIRONMENT	4-47

4.13.2 ANALYSIS OF IMPACT 4-47

4.14 PESTICIDES, SOLID WASTE, RECYCLABLES, AND HAZARDOUS WASTE 4-49

4.14.1 EXISTING ENVIRONMENT 4-49

4.14.2 ANALYSIS OF IMPACT 4-49

4.15 TRAFFIC AND ROADWAY NETWORK 4-51

4.15.1 DESCRIPTION OF AREA 4-51

4.15.2 BACKGROUND TRAFFIC 4-52

4.15.3 SITE DESCRIPTION 4-53

4.15.4 SITE GENERATED TRAFFIC 4-54

4.15.5 TRAFFIC IMPACT 4-54

4.15.6 SIGNAL WARRANT ANALYSIS 4-58

4.15.7 PHASE I OF TRAFFIC IMPROVEMENTS 4-59

4.15.8 SIGHT LINE ANALYSIS 4-60

4.15.9 TRAFFIC ACCIDENT DATA 4-60

4.16 PUBLIC UTILITIES AND SERVICES 4-63

4.16.1 WATER SUPPLY 4-63

4.16.2 ANALYSIS OF WATER SUPPLY IMPACTS 4-63

4.16.3 SANITARY SEWER 4-64

4.16.4 ANALYSIS OF SANITARY SEWER IMPACTS 4-64

4.16.5 ELECTRIC, GAS, TELEPHONE, AND CABLE SERVICE 4-65

4.16.6 ANALYSIS OF ELECTRIC, GAS, TELEPHONE, AND CABLE SERVICE IMPACTS 4-65

4.17 HAZARDS TO HUMAN HEALTH OR SAFETY 4-67

5.0 IMPACT EVALUATION 5-1

5.1 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS 5-1

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES 5-1

5.3 MITIGATION OPPORTUNITIES 5-1

5.4 CERTIFICATES, PERMITS, APPROVALS 5-2

5.5 PROJECT COSTS AND BENEFITS 5-3

APPENDIX A STATE AGENCY CIRCULATION

APPENDIX B ARCHEOLOGICAL RECONNAISSANCE SURVEY WITHOUT APPENDIX III

APPENDIX C EASTERN BOX TURTLE FIELD STUDY

APPENDIX D TRAFFIC IMPACT STUDY

**DOCUMENTS INCORPORATED BY REFERENCE BUT NOT INCLUDED WITH THIS
VOLUME:**

ARCHEOLOGICAL RECONNAISSANCE SURVEY APPENDIX III
TOWN CENTER STORMWATER MANAGEMENT STUDY
MASTER CONCEPT PLAN (MCP) & DEVELOPMENT STANDARDS (DS)
MASTER PLAN JOB CREATION ANALYSIS
CULTURAL AND HERITAGE IMPACT STATEMENT
COMMUNITY & INSTITUTIONAL FACILITIES AND SERVICES
 FISCAL IMPACT ANALYSIS
 LETTER FROM TOWN MANAGER/POLICE AUTHORITY, DATED FEBRUARY 4, 2005
PUBLIC WORKS AND UTILITIES
 PUBLIC WORKS IMPACT STATEMENT
 FAX FROM EARTH TECH TO TOWN OF HEBRON, DATED NOVEMBER 24, 2004
 LETTER FROM HEBRON PUBLIC WORKS DIRECTOR, DATED NOVEMBER 8, 2004
 LETTER FROM BIRMINGHAM UTILITIES, DATED FEBRUARY 12, 2004
 LETTER FROM BIRMINGHAM UTILITIES, DATED DECEMBER 2, 2004
NATURAL RESOURCES INVENTORY AND IMPACT ASSESSMENT
TRAFFIC IMPACT STUDY RAW DATA

TABLES

TABLE 4-1: LOCATIONAL GUIDE MAP CATEGORIES	4-3
TABLE 4-2: PUBLIC SCHOOLS IN THE TOWN OF HEBRON	4-23
TABLE 4-3: CLASS A NOISE ZONE	4-27
TABLE 4-4: CLASS A EMITTER TO DESIGNATED RECEPTOR	4-27
TABLE 4-5: CLASS B NOISE ZONE	4-28
TABLE 4-6: CLASS B EMITTER TO DESIGNATED RECEPTOR	4-28
TABLE 4-7: STORMWATER MANAGEMENT	4-30
TABLE 4-8: CONTROLS USED IN LAND DEVELOPMENT DESIGN PRACTICE	4-30
TABLE 4-9: LIST OF DOMINANT WETLAND FUNCTIONS	4-41
TABLE 4-10: LEVEL OF SERVICE CRITERIA	4-55
TABLE 4-11: A.M. LEVEL OF SERVICE ANALYSIS AT SELECTED INTERSECTIONS	4-55
TABLE 4-12: P.M. LEVEL OF SERVICE ANALYSIS AT SELECIED INTERSECTIONS	4-56
TABLE 4-13: SATURDAY LEVEL OF SERVICE ANALYSIS AT SELECTED INTERSECTIONS	4-56

FIGURES

FIGURE 2-1: CONNECTICUT STATE MAP: HEBRON AND TOLLAND COUNTY HIGHLIGHTED	2-1
FIGURE 2-2: MAP OF THE TOWN OF HEBRON, CONNECTICUT	2-1
FIGURE 2-3: HEBRON TOWN CENTER.....	2-2
FIGURE 2-4: HEBRON ZONING MAP.....	2-3
FIGURE 2-5: VILLAGE GREEN DISTRICT CONCEPTUAL PLAN OF DEVELOPMENT	2-4
FIGURE 2-6: MASTER CONCEPT PLAN OPEN SPACE MAP	2-8
FIGURE 4-1: PROPOSED STATE PLAN OF CONSERVATION & DEVELOPMENT: CAPITAL COG REGION, CT.....	4-2
FIGURE 4-2: HEBRON HISTORIC POPULATION (1800-2000)	4-9
FIGURE 4-3: HEBRON FARMLAND SOIL MAP	4-12
FIGURE 4-4: RAYMOND BROOK WATERSHED AND SITE LOCATION MAP	4-31
FIGURE 4-5: EXISTING VEGETATION ASSOCIATIONS MAP	4-38
FIGURE 4-6: EASTERN BOX TURTLE HABITAT AREAS.....	4-45
FIGURE 4-7: EASTERN BOX TURTLE HABITAT AREAS WITH DEVELOPMENT OVERLAY	4-46
FIGURE 4-8: SPECIAL FLOOD HAZARD AREAS	4-47
FIGURE 4-9: HEBRON, CT ROAD MAP.....	4-51

LIST OF ABBREVIATIONS

ADT	Average Daily Traffic volume
BMP	best management practices
CEPA	Connecticut Environmental Policy Act
CFR	Code of Federal Regulations
CGS	Connecticut General Statutes
CHC	Connecticut Historic Commission
ConnDOT	Connecticut Department of Transportation
CRCOG	Capitol Region Council of Governments
CRRA	Connecticut Resource Recovery Authority's
dBA	A-weighted decibel
DECD	Department of Economic and Community Development
DEP	Department of Environmental Protection
DoAg	Department of Agriculture
DOT	Department of Transportation
DS	Development Standards
DWD	Drinking Water Division
EA	Environmental Assessment
ECD	Environmental Classification Document
EIE	Environmental Impact Evaluation
EMS	Emergency Medical Services
EMTs	Emergency Medical Technicians
EPA	Environmental Protection Agency
ERT	Environmental Review Team
GPD	gallons per day
HCM	2000 Highway Capacity Manual
HVFD	Hebron Volunteer Fire Department
ISD	Intersection Sight Distance
ITE	Institute of Transportation Engineers
LOS	Level of Service
MCP	Master Concept Plan
MGD	million gallons per day
mph	miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
NGVD	National Geodetic Vertical Datum
OPM	Office of Policy and Management
PAST	Public Archaeology Survey Team, Inc
PERD	Permitting, Enforcement and Remediation Division
RCSA	Regulations of Connecticut State Agencies
ROD	Record of Decision
ROW	Right-of-way
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SLOSSS	Suggested List of Surveillance Study Sites
SIEAP	Small Town Economic Assistance Program
SWCD	Soil and Water Conservation District
TASR	Traffic Accident Surveillance Report
v/c	volume-to-capacity ratio
VG	Village Green District

1.0 Executive Summary

The purpose of this document is to assess the potential environmental impacts related to the construction of a proposed office, retail, and residential project covering approximately 148 acres situated on the south side of Main Street (Route 66), the east side of Church Street (Route 85), and the north side of Kinney Road in Hebron. The project is zoned as the Village Green District.

1.1 *Proposed Village Green District*

In 2000, the Town of Hebron re-zoned a large tract of land, owned by the Horton family, from a Residential I district to a newly created zone called the Village Green District. The goal of the district is to create a mixed-use business expansion area within the existing Hebron town center. The Hebron Zoning Regulations were amended to add Section 5.10 entitled 'The Village Green District'

1.2 *Alternatives Analysis*

Historically, several alternative locations have been considered for a business expansion area within the Town of Hebron. Some of the important criteria that would make a site suitable and desirable for a business expansion area such as the Village Green are: proximity to the Town's existing main business district, location within an area presently served by an existing sanitary sewer system, location within an area which could be served by an existing public water supply, and a location that would allow business expansion within an area that would be consistent with the State Plan of Conservation and Development, the Capitol Region Plan of Development and the Town's Plan of Conservation and Development.

1.3 *Summary of Potential Impacts*

The following is an abbreviated summary of the impact assessment. For more detailed information, analysis, and mapping, the reader is directed to §4.0 in the main body of this document.

1.3.1 **Land Use and Zoning**

The proposed development is believed to be consistent with State, regional and local land use planning documents and is in keeping with allowable land uses within the Town of Hebron's *Village Green* designation. Specifically, the following points are noted:

- According to the proposed State Plan of Conservation and Development Areas for the Capital COG Region which is expected to be adopted by the Legislature this year, the Village Green District includes Rural Community Center Areas as well as Preservation and Conservation Areas, with the majority identified as a Rural Community Center. According to the State Plan, Rural Community Centers "promote concentration of mixed-use development such as municipal facilities,

employment, shopping, and residential uses within a village center setting.” It further states that Preservation Areas “protect significant resource, heritage, recreation, and hazard-prone areas by avoiding structural development, except as directly consistent with the preservation value.” The Conservation Areas “plan for the long-term management of lands that contribute to the state’s need for food, fiber, water and other resources and environmental quality by ensuring that any changes in use are compatible with the identified conservation value.” The Village Green District hopes to help continue to promote all three of these area types

- The proposed land uses are consistent with the Village Development designation by the Capitol Region’s *Achieving the Balance: A Plan of Conservation and Development for the Capitol Region*, a designation that includes clustered housing, open space preservation, mixed-use development, and traditional neighborhood design
- The proposed development is located in a Village Green District zone as depicted on the Town of Hebron zoning map and is believed to be compatible with existing surrounding land uses.

1.3.2 Socioeconomics

No displacement of people is expected. The proposed mixed-use development will add a substantial increase in the number of people using the site for employment, shopping, residential, and recreational purposes.

The proposed development is consistent with the Town of Hebron’s Plan of Conservation and Development. The majority of the site is undeveloped; therefore no disruption or division of an established community is expected. Plans focus on clustering development in the vicinity of the existing Town Center while providing lower density uses and buffers as transitions to existing residential zones to the east and south of the site.

The addition of the Village Green will provide employment opportunities for both existing and new residents of Hebron. By adding this “work village” people will be able to work more local than having to commute to Manchester or Glastonbury or Colchester.

1.3.3 Farmland Soil Resources

Hebron’s C&D Plan addresses Agriculture and Farming with a goal to protect as well as promote this resource town-wide. It is the Town’s plan to promote farmland preservation in areas of, or associated with, active farmlands. The Town currently has over 800 acres of permanently preserved farmland in the Town. These areas are much more appropriate for farmland preservation than in areas associated with business and commercial or mixed uses such as the Village Green District.

1.3.4 Historic and Archeological Resources

As part of this study a Phase I Archeological survey of the project area was completed. The report provided by the Public Archaeology Survey Team, Inc recommends that two areas of early historic-period artifact concentrations should be investigated further in the form of a Phase II Intensive Archaeological study. Background research suggests that the artifacts may be associated with the 19th-century Peters family occupation or possibly an earlier occupation. The survey concludes that the "Phase I" data is insufficient to determine whether the assemblage of historic-period artifacts is associated with an undocumented house within the project area or the result of the disposal of refuse from a house on the main road (one of the Peters' houses still stands just outside the project area). As the archaeology of Connecticut freedmen and African Americans in general is in its infancy, intact archaeological deposits that could be firmly associated with the Peters occupation would have importance from an archeological standpoint. No significant prehistoric period resources were identified during the survey.

1.3.5 Aesthetic and Visual Resources

The existing street, building, and open space patterns in the vicinity of the site are reinforced by the proposed development. This will complement the existing street and open space patterns as well as compatibility with the surrounding neighborhood.

1.3.6 Cultural and Heritage Resources

The planned design and placement of buildings, pedestrian walks and landscaping create an old New England Village atmosphere which would be a continuation of the styles present in the Hebron Historic District. Keeping with the old New England Village atmosphere, the project site will reinforce scale, massing and proportions of the surrounding historic area, as well as be easily accessible by pedestrian-traffic. Effort will be made to maintain the rural character by preserving woodlands, wetlands, open fields, stonewalls, and trees along the edge of the roadways.

1.3.7 Community, Institutional, & Recreational Facilities and Services

According to the impact studies, there will be no significant impact to public safety and emergency services (fire and police), the public works department, the educational resources, the recreational resources, or the ancillary businesses.

1.3.8 Air Quality

The proposed uses of the Village Green District (i.e. mixed-use business, light industrial, and residential) are not expected to significantly impact air quality. Air quality impacts are most often associated with vehicular traffic. Increases in Hebron Center traffic as a result of development are not anticipated to increase carbon monoxide levels substantially. Since high levels of carbon monoxide are typically associated with areas of heavy traffic congestion, the project is not anticipated to have an adverse impact on air

quality in Hebron center due to the layout of the Village Green District being conducive to bicycle and pedestrian traffic. Construction related air quality impacts are anticipated to be localized, temporary, and minimal.

1.3.9 Noise

Noise levels at the proposed project site over the long term are expected to be typical of other settings near the Village Green District and no long-term noise related impacts are expected. The primary short-term noise concerns relate to construction and demolition activities and their potential to generate unacceptable levels of noise. Construction activities will be limited to the daytime, when rush hour traffic is at higher levels. The additional traffic and construction related noise is anticipated to be minimal in this environment.

1.3.10 Water Quality and Resources

The Master Concept Plan and Design Standards are laid out such that an effective stormwater management system can be designed which will minimize the negative effects that are normally associated with stormwater discharge. The plan produces a strategy that promotes treatment of stormwater as close to the source as possible rather than collecting it all for treatment at the point of discharge. Many of the stormwater treatment practices proposed employ low impact development techniques. A minimum buffer of fifty feet is maintained between the development and the wetlands boundary to support this design. The intent of the Master Concept Plan and Design Standards is to set the framework and foundation for these designs. Consequently, the effects of the stormwater discharges will be minimal if the ultimate designs incorporate the techniques shown on the Master Concept Plan and within the Design Standards for drainage.

The Hebron Village Green project site is located in the Raymond Brook watershed which is part of the Salmon Regional Basin. Site drainage is directed to one of three drainageways on the property. Since the watercourses on the property are located within the headwaters of the drainage basin, flows emanating from the property would likely be quite variable. The watercourses on and adjacent to the site are classified as Class A surface waters. This designation indicates that this is uncontaminated surface water suitable for recreational use, fish and wildlife habitat, agricultural and industrial supply, and potential drinking water supply. Mitigation via erosion and sediment control and stormwater treatment is anticipated to abate any potential minor impacts.

There are no stratified drift deposits of soil on the property able to supply large quantities of groundwater. However, the groundwater that is present beneath and in the vicinity of the site is classified as GA and GAA. Class GA groundwaters are presumed suitable for direct human consumption without the need for treatment. Class GAA waters are groundwaters contributing to existing public water supply wells.

1.3.11 Natural Land Resources and Formations

No extensive filling or re-grading will be necessary to develop the project site for the proposed Village Green District. Following review of the pertinent geologic information and field investigation, the potential for significant impacts to the physical environment of the project site is not evident. Additionally, existing soils should not present any significant limitations with respect to the construction of the contemplated structures.

1.3.12 Biological Environment

Significant environmental impacts to the biological environment are not expected to occur as a result of the proposed project. The following points are noted:

- The design standards of the Village Green District include provisions that call for the preservation of stonewalls, hedgerows, specimen trees, and barways.
- The open space standards of the Village Green District include provisions that call for the incorporation of buffers to preserve natural resources corridors, protect and include watercourses and wetlands, provide habitat for wildlife, and provide buffers to adjacent uses.
- A comprehensive stormwater management plan that utilizes best management practices to protect wetlands and water resources will be designed and implemented.
- A comprehensive erosion and sediment control plan will be designed and implemented to protect wetlands and watercourses from sedimentation impacts.
- A field study has been performed to find preferred habitat areas for the eastern box turtle, though many of these areas are out of the area of construction. If necessary, an eastern box turtle survey could be conducted after May 2005, specifically within those areas classified as potential habitat areas. If eastern box turtles are found onsite, specific conditions such as habitat preservation, construction scheduling, etc. will be evaluated and incorporated into the Site Development plan where applicable.

1.3.13 Flood Hazard Potential

The proposed activities will take place outside of the 100-year floodplain. Therefore, no associated impacts are anticipated to occur. Inland wetlands help reduce the effects of localized flooding by slowing the flow of surface water runoff and temporarily storing floodwaters within the wetland basin. In addition post development storm water controls will be implemented to mitigate increases in peak runoff rates if determined necessary by a detailed hydrologic analysis.

1.3.14 Pesticides, Solid Waste, Recyclables, and Hazardous Waste

Extensive uses of pesticides are not expected to be used in the Village Green District, at this time. If pesticides are used, proper precautions will be provided and utilized. The current solid waste disposal facilities for solid waste and recyclables should be capable of

handling the additional solid waste created by the project. In that the proposed commercial uses of the Village Green District are generally limited to business and light industrial, there would be no foreseeable uses which would generate significant hazardous waste material. As with any development there is some potential for groundwater and surface water contamination from the storage and potential release of hazardous materials from standard uses such as oil/fuel storage and turf management. Measures have been put into place to mitigate the potential for contamination.

1.3.15 Traffic and Roadway Network

The proposed development for the Horton property in the Village Green District of Hebron, Connecticut between Route 66 and Route 85 is expected to generate a total of 942, 1,780, and 1,673 vehicle trips respectively during the a.m., p.m., and Saturday peak hours. Vehicle access to the site will be provided through a main access road from Route 66 and a second access approaching Route 85. A third vehicle access on Route 85 will enter a trailhead parking lot with only ten spaces and access to hiking trails.

The developer proposes to signalize and construct additional turning lanes at the two main entrances to the site. In addition, Route 66 will be widened for the area between the intersections with Route 85 and Route 316 in order to provide pavement width for improvements at those intersections. After a study of Phase I traffic impacts, it was determined that the main entrance and associated improvements should be done with Phase I of the project, and other off-site improvements will be done later in the project during the subsequent phases. With these proposed improvements, the impact to the existing roadway network is minimized. The site access roads are located appropriately with respect to existing intersections and available sight distances. The internal site design will provide redundant accessibility to heavy use retail areas as well as roadway designs to minimize vehicle speeds. Parking areas for most of the public use areas are shared and located to minimize reducing the village aesthetics while still providing convenient access. In addition, traffic calming measures in the forms of concrete pavers at pedestrian crossings and bands of cobblestone across the traveled way, before pedestrian crossings and at Market Square and Neighborhood Park intersections, are planned to add to pedestrian safety. The design is in general compliance with the Village Green District zoning regulations pertaining to street and parking standards.

1.3.16 Public Utilities and Services

The existing utility systems, coupled with the proposed extensions for water, sanitary sewer, storm drainage, electric, telephone, and cable, will be sufficient to serve the proposed project without causing significant environmental impact. Because of the existing excess capacity in water supply and sanitary sewer systems, the additional draw on utility services to supply this project will be minimal in comparison to available capacities.

1.3.17 Hazards to Human Health or Safety

The Town will determine if evidence of motor vehicle tracks through the project area could indicate if any apparent unauthorized and potentially hazardous dumping has occurred during construction. The property owner and Town Officials will insure that no unauthorized dumping occurs at the project site. Although the project involves very few if any existing facilities that may require rehabilitation and/or demolition, any such activities will adhere to the Department of Public Health's requirements for lead-based paint and asbestos. As the project sites are developed, lighting and parking safety measures will be incorporated.

1.4 Conclusion

Based on the analysis of potential impacts conducted for the proposed Hebron Village Green District, including evaluation of land use and zoning; socioeconomic; farmland soil resources; historic and archeological resources; aesthetic and visual resources; cultural and heritage resources; community, institutional, and recreational facilities; air quality; noise; water quality and resources; natural land resources and formations; biological environment; flood hazard potential; pesticides, solid waste, recyclables, and hazardous waste; traffic and roadway network; public utilities and service; and hazards to human health or safety, no significant environmental impact is anticipated to occur as a result of this project.

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2.0 Project Background

2.1 Introduction

The purpose of this document is to assess the potential environmental impacts related to the Village Green District in the Town of Hebron, Connecticut located in Tolland County as shown in Figure 2-1.

The proposed office, retail, and residential project covers roughly 148 acres situated on the south side of Main Street (Route 66), the east side of Church Street (Route 85), and the north side of Kinney Road in Hebron. The project is zoned Village Green District located in the Town Center as shown in Figure 2-2.

Figure 2-3 is a map of the Hebron Town Center. Figure 2-4 is the Hebron Zoning Map which designates the Village Green District (VG) in an orange color.

The Village Green District is broken up into three distinct components: Village Center, Village General, and Village Edge as shown in Figure 2-5.

The Village Center portion of the Village Green District serves as the focal point and gathering place of the village which is centered on a village green. The Village Center contains shops and services, municipal uses and buildings, residences and other uses to provide for the daily needs of village residents and convenience needs of town residents and may also contain residences.

The Village General portion of the Village Green District is an area where larger retail and office uses are permitted and where employment areas may be located while still containing design and locational elements which are compatible to the Village Center and to a traditional New England village.

The Village Edge portion of the Village Green District is the least dense area of the Village Green District. It primarily serves residential, civic, recreational, and open space uses. It provides a discernible boundary for the Village Green District, preserves natural features, accommodates greenways, contains buffer areas along the edge of the District,

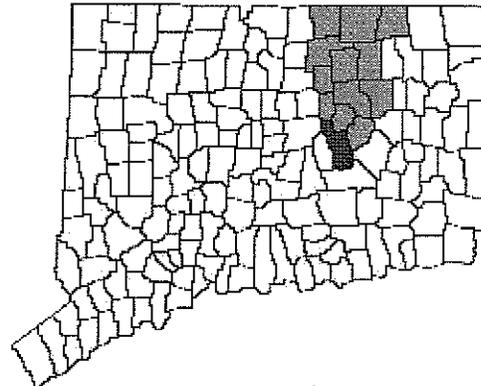


Figure 2-1: Connecticut State Map: Hebron and Tolland County Highlighted

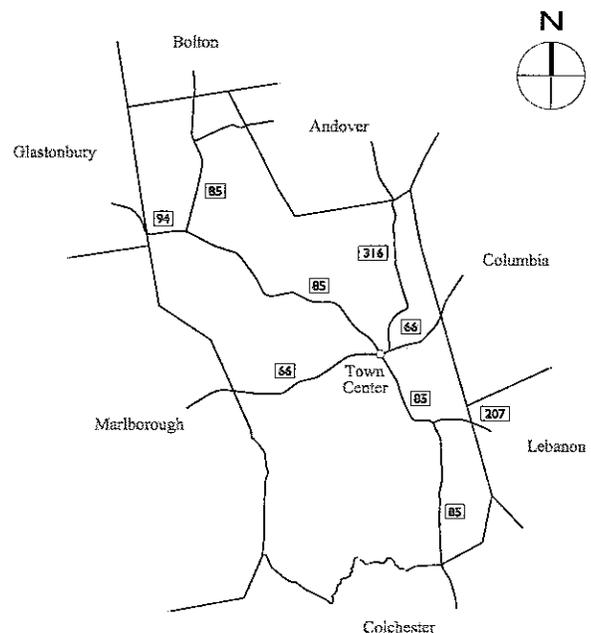


Figure 2-2: Map of the Town of Hebron, Connecticut

and ensures compatibility with the surrounding uses in Hebron Center by serving as the transitional area of the Village Green District.



Source : Digitized Hebron Assessors Map, 2002; Towns of Hebron Mapping

1000 0 1000 2000 Feet

JACOBSON & ASSOCIATES, INC.

Figure 2-3: Hebron Town Center

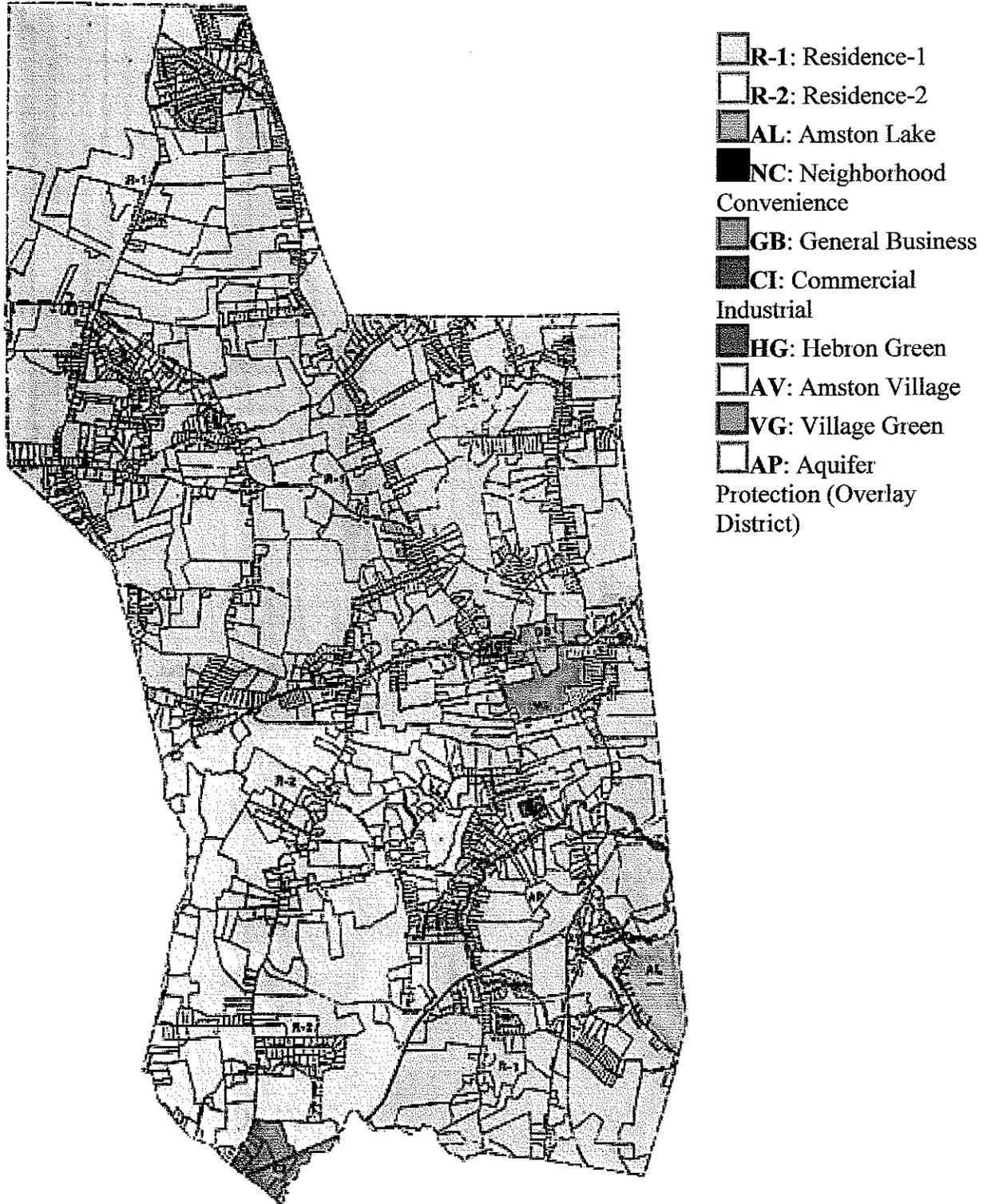


Figure 2-4: Hebron Zoning Map

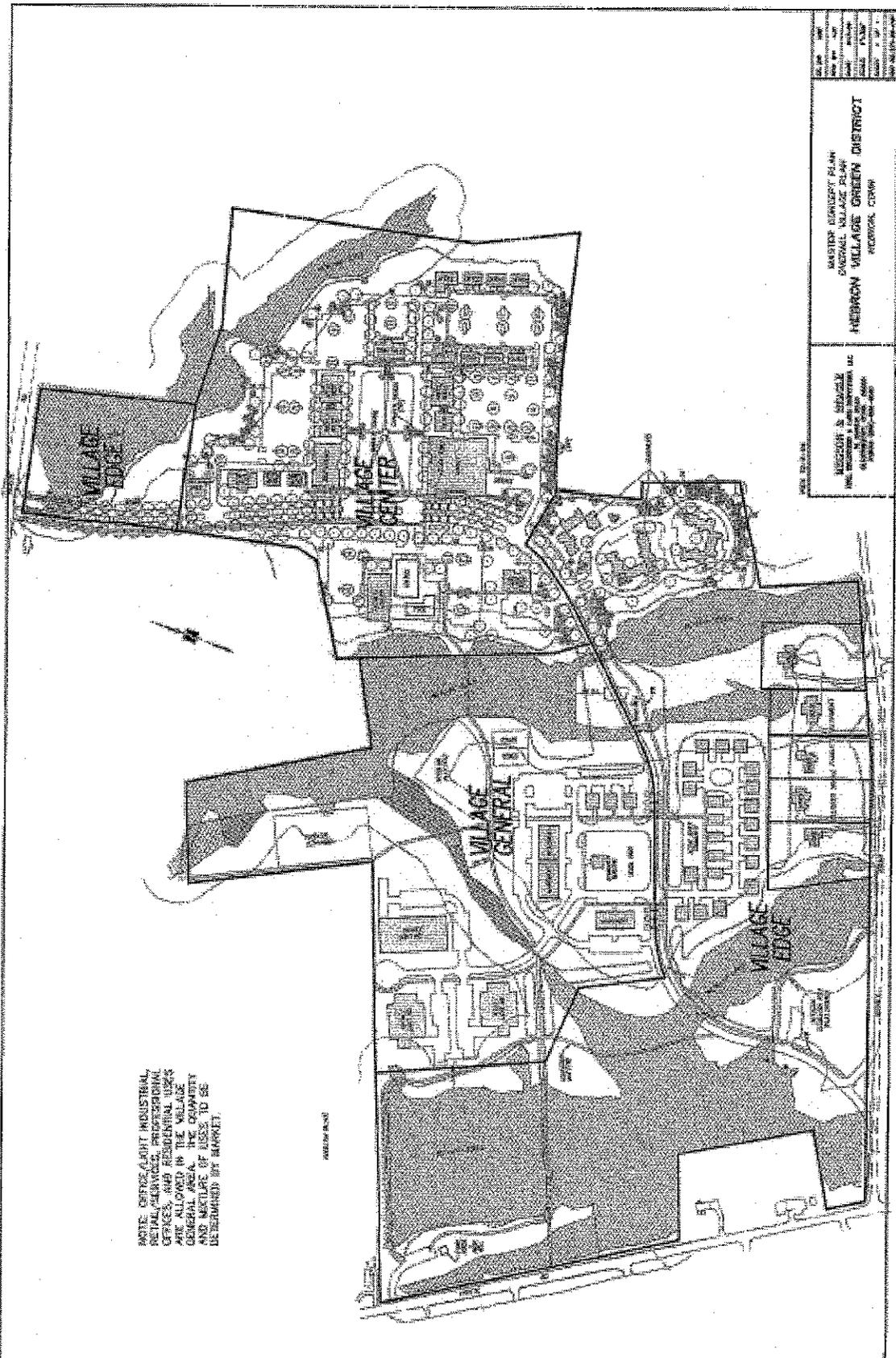


Figure 2-5: Village Green District Conceptual Plan of Development

2.2 *The CEPA Process*

The format and content of this Environmental Impact Evaluation (EIE) is based upon the requirements of the Connecticut Environmental Policy Act (CEPA), Sections 22a-1 through 22a-1h of the Connecticut General Statutes (CGS), and Sections 22a-1 through 22a-1a-12 of the Regulations of Connecticut State Agencies (RCSA). State funds will be utilized for the planning, design and construction of the proposed facilities, thus triggering the CEPA process. The sponsoring agency of this project is the Department of Economic and Community Development (DECD).

The Connecticut Environmental Policy Act recognizes the complex relationship between the natural environment and human actions. The CEPA regulations outline a process whereby, through improved coordination with local, regional, State, and federal governments, as well as public and private entities, a sponsoring State agency can determine and minimize impacts to the resources of the State.

A major function of the CEPA process is the determination of whether or not a project will have a significant effect. Significant effect means substantial adverse impact on the environment (RCSA 22a-1a-1. Definitions). Agencies preparing such CEPA documents must consider direct and indirect effects as well as cumulative impacts. Public input and participation is a major component of the CEPA process. Early scoping and information exchange is essential.

The first phase of the CEPA process is often the Environmental Assessment (EA). In this work task, data and information are evaluated to assess whether a project may potentially cause a significant environmental impact. The outcome of an EA is identification of the need to conduct an Environmental Impact Evaluation (EIE).

At the discretion of the sponsoring agency, or in cases where it is concluded in the EA that the proposed action may have significant environmental impacts, an EIE is prepared in which critical issues are identified and analyzed in detail and the impact of each alternative action is compared.

Public participation in the CEPA process is encouraged through the contact with interested persons and affected agencies. The overall process for public participation and approval of the EIE is summarized below:

- The Department of Economic and Community Development (DECD) distributed an initial notice referred to as the Environmental Assessment, or EA, for the subject project in December of 2003. The sponsoring agency notified State review agencies and other interested parties with regard to the proposed action via a *Scoping* Notice which was published in January of 2004. A copy both the EA and the Scoping Notice are included in "Appendix A."
- Reviewers are given a minimum of twenty (20) calendar days to respond to the Scoping Notice with comments about the nature and extent of environmental impacts that might result. In the subject case, January 9th to February 9th of 2004

was chosen as the comment period. Copies of all scoping comments received are included in "Appendix A."

- Reviewers may request that the sponsoring agency hold a Scoping Meeting to further explain the proposed action. For this project, February 9th of 2004 was chosen as a cut-off date for such requests. None of the reviewing agencies requested that a Scoping Meeting be scheduled; therefore, none was held.
- During the preparation of this EIE, the sponsoring agency must consider the issues and comment provided by the reviewers, along with other information gathered.
- After the Draft EIE is prepared, the sponsoring agency publishes notice of its availability and circulates the draft for review and comment. Any interested parties may provide written comment within forty-five (45) days.
- A public hearing may be held, if requested in accordance with State statutes and Section 22a-1a-11 of the regulations. A period of no less than thirty (30) days following the date of availability of the Draft EIE must be provided before such public hearings are held.
- The sponsoring agency must review comments, perform any additional environmental study and analysis, and amend the evaluation as appropriate. It is the sponsoring agency's responsibility to respond to all substantive comment received. The agency then finalizes the EIE and prepares its Record of Decision.
- The sponsoring agency (in this case, DECD) must forward its Record of Decision and the EIE to the Office of Policy and Management (OPM) for a determination of the adequacy of the evaluation. The following information must be included: (1) public notice documentation; (2) a transcript of the public hearing, if one is held; (3) comments received from all interested parties along with responses to the pertinent issues raised by the public and State agencies; (4) the agency decision relative to proceeding with the proposed action; and (5) a discussion of the intentions for initiation of actions for minimizing impacts.

The CEPA process concludes with the review of the EIE and Record of Decision by OPM and their determination of whether or not regulatory requirements have been satisfied. The Final EIE is the basis for the implementation of the project.

2.3 *Description of the Proposed Action*

The proposed development consists of a variety of land uses, buildings, and open space areas.

All of the retail and most of the office use buildings are centered on the northeast and east section of the site and include a supermarket, restaurants, general retail, office space, a fitness center and a new Town Hall. The retail and office buildings are located around an open market square in the center of the village area. Sidewalks are provided to connect the buildings to the parking areas and to provide safe access for pedestrians.

A total of 123 residential units, including age-restricted detached homes, attached elderly housing units, and single family homes will form communities along the south side of the parcel.

A neighborhood park and community building/clubhouse will be located in the central area of the site with small apartment buildings and attached parking areas surrounding it. Recreational soccer and baseball playing fields and tennis courts will be centrally positioned on the north side of the site.

An area west of the fields is set aside for light industrial or office use and associated parking.

Walking trails for recreational use are proposed through several of the open areas of the site and sidewalks are proposed throughout the site building areas and along the entire length of the street in order to improve safety for pedestrians and bicyclists. The trails and sidewalks have access to Route 85 at three locations, including near a small parking area for hikers at the trailhead. The sidewalk next to the main entrance boulevard provides pedestrian access to Route 66.

The Town has included multiple wetland and non-wetland areas of open land area preserved as part of the redevelopment. These open areas referred to as town owned property as shown in Figure 2-6: Master Concept Plan Open Space Map. Non-wetland areas include the Market Square, the walking trails, the trailhead area, the recreational area, and multiple playfields throughout the Village Green District.

The Town received a Small Town Economic Assistance Program (SIEAP) grant in the amount of \$500,000 to assist in the construction of the new road and utilities to access the Town's new planned mixed-use business expansion area, within the Hebron Town Center, called the Village Green District. The Town is working with private property owners and developers to develop the 148 acre site directly adjacent to the Town's General Business District along Route 66. The State funds are proposed for use toward constructing the initial 1,000 feet of road and utilities as a public incentive for private investment.

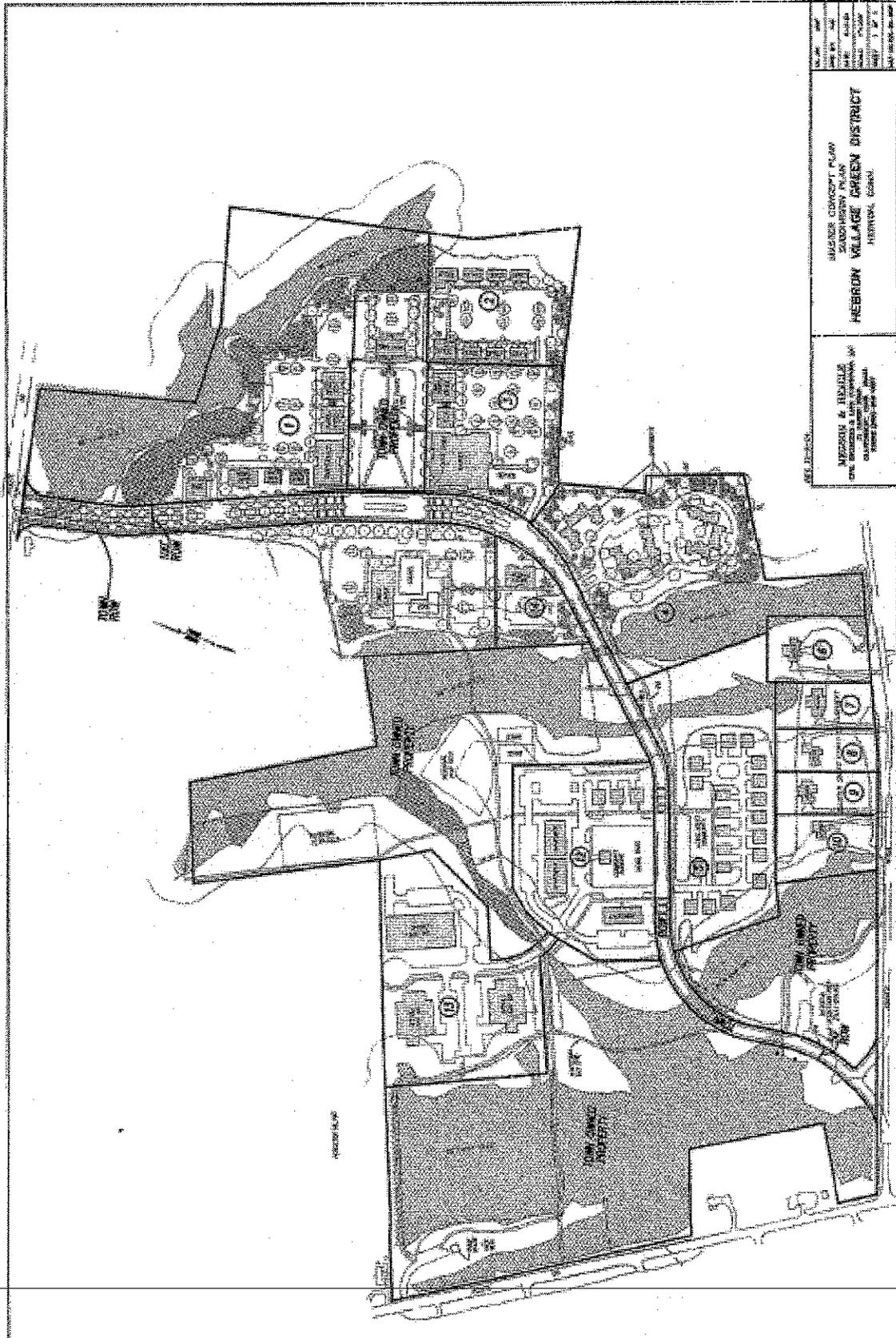


Figure 2-6: Master Concept Plan Open Space Map

2.4 *Purpose and Need*

The existing General Business District in Hebron is only 129 acres and is primarily developed. The remaining undeveloped portions of the existing General Business District are encumbered by wetlands and steep slopes. The Village Green District provides a logical area for planned, controlled business growth, adjacent to the General Business District and in a manner that is compatible to that district. There is a demand for this type project including offices, retail, grocery, fitness center, apartments, age-restricted housing (both apartment and condominiums), conventional apartments, and light industrial. The project will include walking trails and athletic fields, all of which are in big demand. The Village Green District will compliment the existing businesses on Main Street in Hebron, not presenting any adversity to them.

Through the Village Green District the Town plans to improve its tax base, encourage planned growth of commercial uses as opposed to solely residential development, create opportunities for employment and shopping for area residents within town to reduce the amount of out-of-town commuting, and build upon the existing center of mass at the town center.

As stated in *Town of Hebron Plan of Conservation and Development*, "This area has been identified for a number of years as a potential business expansion area to serve Hebron's growing population. Recently, more intensive studies have been conducted to determine whether this location would be the best site within the Town Center to establish a mixed-use development. After analyzing soils, slopes, transportation needs, and available land throughout the center, it has been determined that this is the preferred site."

2.5 *Relationship to Other Documents*

Numerous State and regional planning documents have been evaluated in the context of this Environmental Impact Evaluation, as listed below:

1. *Conservation and Development Policies Plan for Connecticut, 2004-2009*. Office of Policy and Management, Hartford, CT. June 07, 2004.
2. *Achieving the Balance: A Plan of Conservation and Development for the Capitol Region*. Capitol Region Council of Governments. May 28, 2003.
3. *Livable Communities Toolkit: A Best Practices Manual for Metropolitan Regions*. Capitol Region Council of Governments. June 2002.
4. *Town of Hebron Plan of Conservation and Development*. Town of Hebron Connecticut. January 2004.
5. *Town Center Stormwater Management Study, Town of Hebron, Connecticut*. Nathan L. Jacobson & Associates, Inc. February 8, 2004.
6. *CBD Update and Proposed Business Expansion Area; Environmental Review Team Report; Prepared by the Eastern Connecticut Environmental Review Team of the Eastern Connecticut Resource Conservation and Development Area, Inc.*

for the Conservation Commission and Economic Development Commission, Hebron, CT CT Environmental Review Teams. June 2000

7. *Regulations of Connecticut State Agencies (RCSA); Title 22a; Section 22a-69-1 to 22a-69-7.4; Control of Noise*. July 22, 2002.

Two studies were conducted specifically for this CEPA study. These are included in Appendix B and Appendix C.

1. *Phase I Archaeological Reconnaissance Survey; Hebron Village Green Development; Hebron, Connecticut*. Public Archaeology Survey Team, Inc. January 2005.
2. *Eastern Box Turtle Habitat Survey; Hebron Village Green; Hebron, Connecticut*. New England Environmental Services; Blackledge River Nursery; R. Richard Snarski, CPSS, PWS. January 26, 2005.

The Applicant submitted additional documents which were used during this Environmental Impact Evaluation; the Traffic Impact Report is included as Appendix D, all other documents are incorporated by reference but not included in this volume. They can be viewed in the Supplemental Volume.

1. *Master Concept Plan (MCP) & Development Standards (DS); Hebron Village Green District; Property of Horton Brothers, LLC*. Megson & Heagle Civil Engineers & Land Surveyors. December 2004.
2. *Property of Horton Brothers, LLC; Hebron Connecticut, Village Green District; Public Works Impact Statement (Stormwater Systems, Lighting, Parking, Wastewater)*. Mark W. Friend, P.E., Soil Scientist. August, 2004.
3. *Cultural and Heritage Impact Statement; Horton Property, Hebron-Village Green District*. Raymond E. Jefferson, Landscape Architect. August 12, 2004.
4. *Natural Resources Inventory and Impact Assessment; Hebron Village Green; Hebron, Connecticut*. Land-Tech Consultants, Inc. August 24, 2004
5. *Traffic Impact Report; Village Green District; Hebron, Connecticut*. F A. Hesketh & Associates, Inc. August 24, 2004.
6. *Fiscal Impact Analysis; Horton Brothers, LLC, Village Green District; Hebron, Connecticut*. Stewart Appraisal Services. August 23, 2004.

3.0 Alternatives Analysis

3.1 *Alternatives Considered*

The Town of Hebron has planned for a business expansion area within the community as the major component of its economic development efforts. Over time, several sites have been considered for such a project. Among the criteria that would make a site suitable and desirable for such a business expansion area are the following:

- Proximity to the Town's existing main business district
- Location within an area presently served by an existing sanitary sewer system.
- Location within an area which could be served by an existing public water supply.
- Location that would allow business expansion within an area that would be consistent with the State Plan of Conservation & Development; the Capitol Region Plan of Development; and, the Town's Plan of Conservation and Development.

Historically, several alternative locations have been considered for a business expansion area within the Town of Hebron. Among alternative sites considered for such a business expansion area are the following:

- Within the Commercial/Industrial Zone in the southerly portion of the Town adjacent to the Colchester Border in the area of Jones Street;
- Within an area that is located in a Residential Zone in the southerly portion of the Town in the vicinity of Route 85; and
- The location of the current Village Green District on the Horton Brothers property.

3.2 *No Action Alternative*

Implementation of the No Action Alternative would fail to recognize the clear and established need for such a mixed use development within the Town of Hebron and would also fail to utilize the extensive work done by the Town Boards and Commissions along with Town Staff to bring this important and long anticipated project to fruition. The No Action Alternative is not a reasonable because it is all but certain that this parcel will be developed in some form. Had the Village Green District not been proposed on the subject property, it is most likely that a residential development would be proposed. Such a project, while having similar environmental impacts, would not promote the economic benefits or be conducive to the development pattern which the Town is striving to achieve. Therefore, the No Action Alternative was not considered further.

3.3 *Preferred Alternative*

Through much study it has been determined that the Village Green District is the ideal location for a business expansion area that would meet the Town's economic development needs, yet be consistent with the *Town of Hebron Plan of Conservation and Development*. A market study was done entitled "Business & Technology Park, Hebron, Connecticut, Preliminary Marketability Review" by Stockton Associates, February 5, 1997. The study determined that this is an excellent site for such use. As stated in that planning document, "This area has been identified for a number of years as a potential business expansion area to serve Hebron's growing population. Recently, more intensive studies have been conducted to determine whether this location would be the best site within the Town Center to establish a mixed-use development. After analyzing soils, slopes, transportation needs, and available land throughout the center, it has been determined that this is the preferred site."

4.0 Existing Environment and Analysis of Impact

4.1 Land Use and Zoning

An understanding of existing land use plans and policies at the local, regional and State level is essential to the analysis of potential alterations of land uses. The following discussion establishes the framework of land use policies that apply to the project area. Consistency of the project with these plans and policies is evaluated herein.

4.1.1 Statewide Land Use Conservation and Development

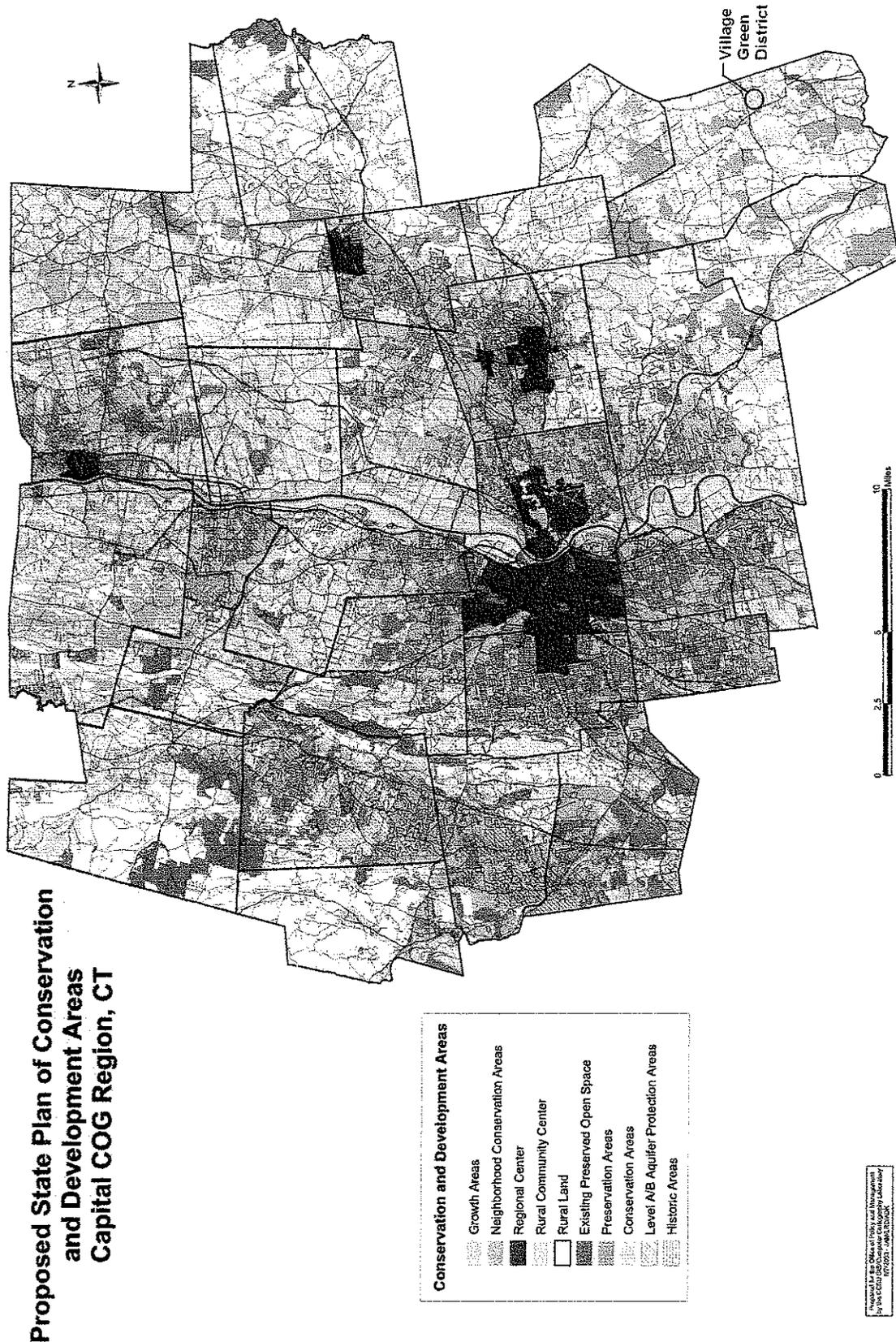
The following discussion presents portions of the *Conservation and Development Policies Plan for Connecticut, 2004-2009* as they relate to the project. Not all policies are included in this discussion, as they may not directly apply. For an expanded review of the Plan, the reader is directed to the full 110-page document.

The *Conservation and Development Policies Plan for Connecticut* (the Plan) is a statement of the State's growth, resource management, and public investment policies. The Plan provides a policy and planning framework for the administrative and programmatic actions and capital and operational investment decisions of State government that influence the future growth and development in Connecticut. The objective of the Plan is to guide a balanced response to human, environmental, and economic needs in a manner that best suits the future of Connecticut. The Connecticut General Assembly, in accordance with Sections 16a-24 through 33 of the Connecticut General Statutes, established the Plan.

Although the Plan strives to achieve a high degree of consistency with municipal and regional plans of conservation and development and local zoning regulations, only state agency actions are required to be consistent with the Plan. Municipalities must consider the Plan and note any inconsistencies when they update their own plans, but they are not required to reconcile any differences.

The Conservation and Development Plan Locational Guide Map as shown in Figure 4-1 apportions the State into land categories according to each area's characteristics and suitability for different forms of development or conservation activities. The Village Green Site is highlighted on the map.

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**Proposed State Plan of Conservation and Development Areas
 Capital COG Region, CT**

Figure 4-1: Proposed State Plan of Conservation & Development: Capital COG Region, CT

The categories of land use are designated on the Locational Guide Map as follows:

Table 4-1: Locational Guide Map Categories

Category	Development Priority	Map Color Code
Regional Centers	1	Red
Neighborhood Conservation Areas	2	Pink
Growth Areas	3	Beige
Rural Community Centers	4	Yellow
Category	Conservation Priority	Map Color Code
Existing Preserved Open Space	1	Dark Green
Preservation Areas	2	Medium Green
Conservation Areas	3	Light Green
Rural Lands	4	White

There is a proposed change to the State Plan of Conservation and Development Areas for the Capital COG Region which is expected to be adopted by the Legislature this year. Currently the State Plan of Conservation and Development Areas for the Capital COG Region, only designates the General Business District of Hebron and the corridor of Route 66 as Rural Community Centers. The proposed change expands the Rural Community Center Area to include the Village Green District. Although the majority of the Village Green District is identified as Rural Community Center Areas, some of the open-space areas will be designated as Preservation Areas and Conservation Areas.

According to the State Plan, Rural Community Centers “promote concentration of mixed-use development such as municipal facilities, employment, shopping, and residential uses within a village center setting.” It further states that Preservation Areas “protect significant resource, heritage, recreation, and hazard-prone areas by avoiding structural development, except as directly consistent with the preservation value.” The Conservation Areas “plan for the long-term management of lands that contribute to the state’s need for food, fiber, water and other resources and environmental quality by ensuring that any changes in use are compatible with the identified conservation value.” The Village Green District hopes to help continue to promote all of these area types.

4.1.2 Capitol Region Land Use Plan

The Town of Hebron is located within the Capitol Region Council of Governments (CRCOG) regional area. The document entitled *Achieving the Balance. A Plan of Conservation and Development for the Capitol Region*, is advisory to its member municipalities, including the Town of Hebron. The Plan presents issues that are regional in scope, and its implementation relies heavily on action at the municipal level to put land use regulations in place that are consistent with the Plan’s policy recommendations. The *Achieving the Balance* plan is intermediate between the municipal Plan of Conservation

and Development and the State Conservation and Development Policies Plan for Connecticut. There is no mechanism for enforcement of the regional plan; instead it relies on the voluntary cooperation and regional stewardship among its member municipalities.

The Plan is an extensive guide for the conservation and development of Connecticut's Capitol Region which contains six major themes:

1. Focus new regional development in areas in which existing and planned infrastructure can support that development.
2. Support efforts to strengthen and revitalize Hartford, the Capitol Region's central city, and also support the revitalization of older, urbanized areas throughout the region.
3. Develop in a manner that respects and preserves community character and key natural resources.
4. Implement open space and natural resource protection plans that acknowledge and support the multi-town nature of our natural systems.
5. Support the creation of new employment and housing opportunities, and transportation choices, to meet the diverse needs of our region's citizens.
6. Encourage regional cooperation in the protection of natural resources, the revitalization of urban areas, and economic development

In addition CRCOG has created a document entitled *Livable Communities Toolkit: A Best Practices Manual for Metropolitan Regions*. Chapter 4 of the manual is entirely devoted to promoting Village Development for municipalities in their region. The manual suggest five tools that the municipality should use in their "toolbox" in the creation of a village development:

1. Clustered Housing
2. Open Space Preservation
3. Mixed Use Development
4. Alternatives to Conventional Sewer and Septic
5. Traditional Neighborhood Design

The manual also suggests ten "keys to success" for the municipality to consider:

1. Provide density incentives and reduce the allowable base density
2. Consider establishing a density penalty for conventional subdivisions
3. Establish a homeowner's association.
4. Require homeowner's associations to follow a civic model of governance.
5. Allow mixed-use buildings, as well as mixed-use neighborhoods.
6. Allow home occupations, subject to development standards.
7. Adopt standards to ensure that non-residential uses are small-scale and in keeping with the neighborhood character.
8. Encourage village development through "planned unit development" zoning
9. Organize a public education campaign.
10. Undertake a demonstration project.

While no one development can be expected to meet all of the objectives proposed by CRCOG, land uses, regulations, and proposed development plans should strive for consistency with the purpose behind their plans.

4.1.3 Municipal Plan of Development

The *Town of Hebron Plan of Conservation and Development* documents the community's land use philosophy and planning framework for managing the Town's future physical, economic, and social environment. The Plan specifies goals, policies, and land use recommendations designed to protect and promote the overall health, wealth, and safety of existing and future residents. The Plan was adopted in accordance with the provisions of Section 8-23 of the Connecticut General Statutes, as amended. Section 8-23 required the Plan to provide documentation of the town's plans in regards to its future growth and to give direction to both public and private development in both the long-term vision of the community but also to offer guidance for short-term decision making.

The Town of Hebron Plan of Conservation and Development designates this project as being in the Village Green District zone, as previously shown in Figure 2-4: Hebron Zoning Map. The Plan continues on to say "This area has been identified for a number of years as a potential business expansion area to serve Hebron's growing population. Recently, more intensive studies have been conducted to determine whether this location would be the best site within the Town Center to establish a mixed-use development. After analyzing soils, slopes, transportation needs, and available land throughout the center, it has been determined that this is the preferred site."

The Plan designates six objectives for the Village Green District.

1. The Village Green District should be a mixed-use zone with elements of commercial, retail, office, professional, residential, cultural, educational, recreational, and light industrial uses. Provisions for industrial condominiums and industrial incubator space should be encouraged.
2. Residential uses should be integrated with the commercial /retail uses, as had historically occurred around the Hebron Green, which includes shop owners, and other living quarters above the businesses.
3. Development should be land/soil/topography based, with consideration given to preserving natural features. Streams and wetlands should serve as buffer areas, and provide opportunity for passive recreation such as walking paths and trails.
4. Buffer areas along the boundary of the Village Green District shall be provided to establish a transition to adjacent established residential areas; this can be provided by the use of open space, residential uses and/or retention of existing vegetation within these buffer areas.
5. Visual coherency is important. Development should be mixed, but also "integrated". Design standards should be established by the town and enforced by a "design development – site review" process, through the Planning and Zoning Commission, which encourages businesses that are interested in the longer-term welfare of the town.

6. The development should be “human scale”:
 - Building height restrictions should be included in the design regulations
 - Many buildings should be built at the street line
 - Adequate parking should be provided behind buildings with landscaping and trees, within easy walking distance to a variety of features.
 - Perimeter walkways should be provided around the zone that ties into the Hebron Green walks and other walkways within Hebron Center.
 - Integrated sidewalks and trails should be constructed to facilitate walking from Hebron Elementary School and Stonecroft senior housing to the Library or to the central business district.
 - A focal point for the new business center should be a new Town Green, which can establish an identity to the area and serve as a new community-gathering place.
7. Infrastructure:
 - The town should leverage the investment in the sewers by attempting to develop additional infrastructure, such as roads, through government grants.
 - The Town should solicit the development of a commercial water supply within the district for domestic and emergency supply use
 - The Town should seek to insure that a high quality communications capability is available within the proposed district. Incorporation of underground utilities should be required.

4.1.4 Land Uses in the Project Vicinity

As discussed later in this document in §4.2.2, the Hebron Village Green District is located near the General Business, Hebron Green, and Residence-1 zoning districts. As discussed later in this document, measures are being taken to keep the Village Green District in fashion with the surrounding areas.

4.1.5 Analysis of Land Use and Zoning Impact

The proposed development is believed to be consistent with State, regional and local land use planning documents and is in keeping with allowable land uses within the Town of Hebron’s *Village Green* designation.

At the current time, the Village Green District includes both Rural Community Center Areas as well as Preservation Areas, the majority of which is a Rural Community Center Area. The Village Green District hopes to help continue to promote both of these area types.

The proposed land uses are consistent with the Village Development designation by the Capitol Region’s *Achieving the Balance: A Plan of Conservation and Development for the Capitol Region*, a designation that includes clustered housing, open space preservation, mixed-use development, proposed development proposes conventional and traditional neighborhood design.

The proposed development is located in a Village Green District zone as depicted on the Town of Hebron zoning map and its uses are believed to be compatible with existing surrounding land uses.

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4.2 Socioeconomics

The following information regarding demographics and employment was obtained in part from the *Town of Hebron Plan of Conservation and Development* (1/2004). This discussion is intended to provide an overall background of the demographic make-up of the Town of Hebron and the proposed Village Green District.

4.2.1 Demographics

The Town of Hebron was incorporated in the year 1708. Hebron is located in central Connecticut, approximately twenty miles southeast of Hartford. Across the 37.26 square miles of the Town, there is a population density of approximated 233 persons per square mile. As of the 2000 US Census, the population of Hebron was 8,610. Hebron has enjoyed a significant population growth since the 1960's. Figure 4-2 presents population data trends for the Town of Hebron over the past two-hundred years.

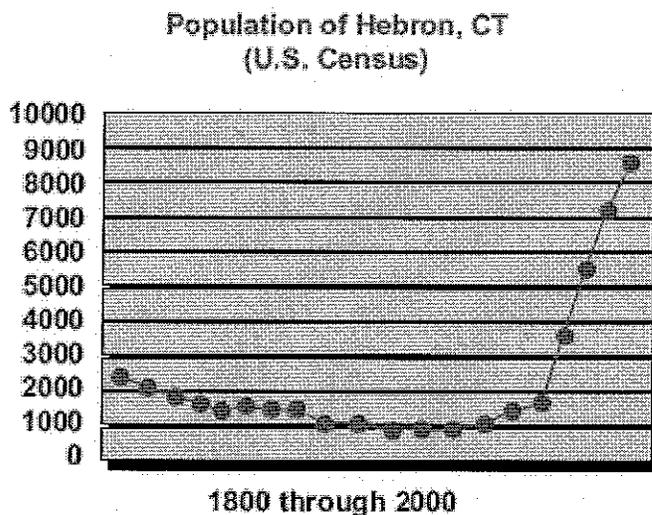


Figure 4-2: Hebron Historic Population (1800-2000)

Source: U.S. Census Bureau, *Town of Hebron Plan of Conservation and Development 2004*

The Town has outpaced many, and at times all of its surrounding neighbors. This rate of growth is particularly significant when compared to the regional and State populations that have remained relatively stable during the past two decades.

4.2.2 Neighborhood

The neighborhood in the project area consists of three additional zones: Residence-1 District, the General Business District, and the historic Hebron Green District, which all make up what is referred to as the "Town Center." The Hebron Town Center serves as the main shopping area of the community. It is the area of Town that contains a range of community services. And, it also serves as the community-gathering place for important events. The *Town of Hebron Plan of Conservation and Development* states, "It is important to recall that this area contains the historic center of Hebron. While development will continue to occur here and change is inevitable, new development will

be encouraged to occur in such a way that respects the Center's historic roots and its present day character."

One of the Town of Hebron's specific goals for the Town Center, is to "develop a visually coherent and definable Town Center that is the civic, commercial, social, educational, recreational, and cultural focal point of the community. Encourage an economically sound commercial district as a base from which town services can be provided, that: does not adversely affect water supplies or the environment; and, allows for an appropriate mix of business and residential land uses commonly found in historic town centers." As stated throughout this document, the Town is working hard to make the Village Green District help fulfill this goal.

4.2.3 Employment

As of 2002, the top five employers in Hebron were: Ted's Supermarket, Town of Hebron, Regional School District #8, Hemlock's Outdoor Recreation Center, and Hebron Pharmacy. As of May 2004, Hebron's labor force is 4,622 and the unemployment rate is 3.7%.

4.2.4 Analysis of Impact on Socioeconomics

No displacement of people is expected. The proposed mixed-use development will add a substantial increase in the number of people using the site for employment, shopping, residential, and recreational purposes.

The proposed development is consistent with the Town of Hebron's C&D plan. The majority of the site is undeveloped; therefore no disruption or division of an established community is expected. Plans focus on clustering development in the vicinity of the existing Town Center while providing lower density uses and buffers as transitions to existing residential zones to the east and south of the site.

The addition of the Village Green will provide employment opportunities for both existing and new residents of Hebron. According to the Master Plan Job Creation Analysis prepared by MetroHartford Alliance, it is expected that the Village Green District will provide an additional 984 jobs. By adding this "work village" people will be able to work more local than having to commute to Manchester or Glastonbury or Colchester.

4.3 *Farmland Soil Resources*

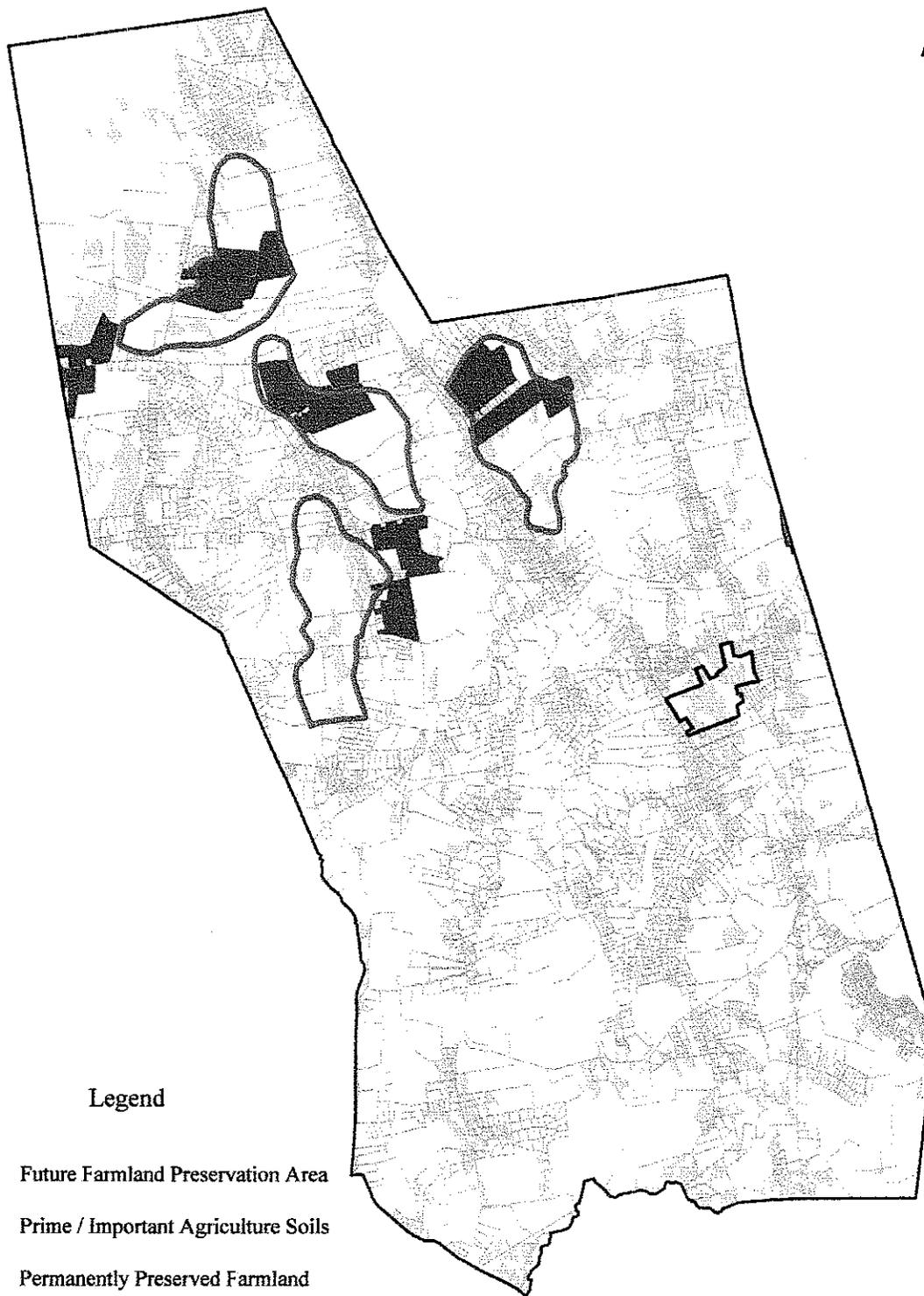
4.3.1 Background

The Department of Agriculture (DoAg) notes that the land affected by the proposed development has significant farmland soils value that the Town should consider in its planning effort. However, DoAg does not find the project plans to be unfavorable to its agency's planning program.

4.3.2 Analysis of Impact on Soil Resources

Hebron's C&D Plan addresses Agriculture and Farming with a goal to protect as well as promote this resource town-wide. It is the Town's plan to promote farmland preservation in areas of, or associated with, active farmlands. The Town currently has over 800 acres of permanently preserved farmland in the Town as shown in Figure 4-3. These areas are much more appropriate for farmland preservation than in areas associated with business and commercial or mixed uses such as the Village Green District. The Town also has plans for future farmland preservation which are concurrent with these already preserved areas in the northwest of Town. It is the intent of the Town that these measures will help offset the impact of the loss of 76± acres of farmland caused by the creation of the Village Green project.

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Legend

-  Future Farmland Preservation Area
-  Prime / Important Agriculture Soils
-  Permanently Preserved Farmland
-  Village Green

3000 0 3000 Feet

Source : Digitized Hebron Assessors Map, 2002; Land Use Mapping December 31, 2002 ;USDA NRCS Digitized Soil Mapping, 1995

Figure 4-3: Hebron Farmland Soil Map

4.4 *Historic and Archeological Resources*

The following information regarding historic and archeological resources has been obtained in part from the *Phase I Archaeological Reconnaissance Survey* (1/2005) which was performed as part of the CEPA study

4.4.1 **Background**

The State Historic Preservation Office (SHPO) reports that this project is located in immediate proximity to the Hebron Center Historic District, which is listed on the National Register of Historic Places. The Connecticut Historic Commission (CHC) recommended a professional reconnaissance survey due to the high sensitivity the area possess for prehistoric and historic archaeological resources. CHC also requested that preliminary development and landscaping plans be provided to CHC for review of potential visual impacts upon the Hebron Center Historic District. The Town's Village Green District Regulations requires a cultural/aesthetic/heritage impact statement as part of the development standards.

A reconnaissance survey was performed by Public Archaeology Survey Team, Inc. (PAST). The purpose of the reconnaissance survey, which included background research and subsurface investigations, was to identify all potentially significant cultural resources within the project area which may be affected by the proposed undertaking. The reconnaissance survey will aid in locating all archaeological (below-ground) sites and above-ground (historic) resources which may be eligible for listing in the National Register of Historic Places.

The reconnaissance survey was broken into multiple steps. First, information was collected in background research, informant interviews and walkover surface inspection in order to establish the archaeological sensitivity of the project area. The sensitivity assessment was then refined in a walkover visual inspection, in which areas of disturbance and visible cultural remains were noted. Systematic subsurface testing was then conducted in those areas identified as having moderate to high archaeological potential.

The SHPO mandated that test pits be excavated at no greater than 15-meter intervals in areas of moderate to high sensitivity. The SHPO expressly identifies these areas as land apparently undisturbed other than by plowing, well-drained soils, slope of less than 15%, and, particularly, areas in close proximity to fresh or salt water resources. In other words, the portions of the project area that are in excess of 15% slope, extremely disturbed, paved, wetlands, or otherwise un-testable, are eliminated from subsurface testing because they have either low archaeological potential or cannot be tested. All remaining areas must be tested with shovel test pits at 15-meter intervals unless an exception is granted in writing by the SHPO.

Map information and visual inspection indicated that the 30.39-acre project includes six acres of wetlands, which are not suitable for subsurface testing. Land in excess of 15%

slope and stony soils, comprising about 5.39 acres, has low archaeological potential and was eliminated from subsurface testing, bringing the total “testable” area to approximately nineteen acres

Each test pit was fifty centimeters square and was hand-excavated with shovel and trowel to sterile glacial sediments. All excavated material was passed through quarter-inch mesh hardware cloth to recover small items of cultural material and each pit was backfilled immediately upon completion. Stratigraphic profiles were recorded for each pit, including the total thickness, texture, and Munsell color of soil horizons or sedimentary strata. All recovered artifacts were bagged by provenience and recorded in the field. Isolated findspots were further sampled by the placement of test pit arrays. Each array consisted of four test pits placed at two meters distance from the original find on the four cardinal directions. Areas not conducive to transect sampling or potentially sensitive areas falling between test transects were sampled by “judgment” test pits, located at the discretion of the field supervisor. All recovered cultural materials were bagged and transported to PAST’s laboratory and were properly cleaned, catalogued, inventoried, curated, and conserved, if necessary.

4.4.2 Analysis of Impact on Historic and Archeological Resources

A total of 302 shovel test pits were required to complete the systematic sampling of the proposed development within the nineteen acres of the 30.39-acre “Phase I” parcel determined to have archaeological potential. Two-hundred-eighty-eight of the pits were located on transects, four pits were excavated as part of an array around the only prehistoric find, and ten pits were placed at the field supervisor’s discretion. Fifty-nine (19.5%) of the test pits yielded historic period artifacts, primarily dating from the late 18th to the mid-19th centuries and concentrated in two loci in the western portion of the project area (Site 67-3). Two-hundred-forty-three pits were sterile (i.e., produced no cultural material).

One of the pits, T12-10, located in the southwestern corner of the project area, yielded a single flake produced during the manufacture or modification of a stone tool. The flake appears to be rhyolite, a volcanic material which does not naturally occur in the region. Rhyolite sources known to have been exploited by prehistoric Native Americans in southern New England are generally confined to present-day eastern Massachusetts and northern Rhode Island. No additional prehistoric artifacts were recovered in the test pit array placed around T12-10, suggesting the flake is unlikely to be associated with a significant prehistoric site in the area.

The majority of the area expected to be affected by the proposed development is presently in use as a cornfield. The remainder of the project area is comprised of mixed deciduous forest and scrub growth along the margins of the two wetlands located in the northeast corner and along the western edge of the parcel boundary. A significant percentage of the non-wetland area within the parcel will be impacted by the proposed construction and landscaping activities. A review of relevant archaeological and ecological data suggested that the “Phase I” parcel had a moderate to high archaeological

sensitivity. Archaeological reconnaissance testing of the parcel identified one historic period archaeological resource, designated as Site 67-3, within the impact area. No significant prehistoric period resources were identified during the survey.

PAST recommends that the two areas of early historic-period artifact concentrations, in Site 67-3, be investigated further in the form of a Phase II Intensive Archaeological Study. Background research suggests that the artifacts may be associated with the 19th-century Peters family occupation or possibly an earlier occupation. (Caesar Peters was purchased as a slave by Mary Peters at the age of eight and later, when a young man, was sold to her son, the Rev. Samuel A. Peters, the notorious Tory propagandist.) The "Phase I" data is insufficient to determine whether the assemblage of historic-period artifacts is associated with an undocumented house within the project area or the result of the disposal of refuse from a house on the main road (one of the Peters' houses still stands just outside the project area). The initial analysis of artifacts, particularly the creamware, suggests an occupation that would be consistent with that of Caesar Peters, but further documentary research would be necessary to substantiate the association. As the archaeology of Connecticut freedmen and African Americans in general is in its infancy, intact archaeological deposits that could be firmly associated with the Peters occupation would have importance from an archeological standpoint.

A more intensive subsurface archaeological investigation of Site 67-3 would aid in determining the presence of a house or other structure within the area. In addition, a more intensive documentary research, in the form of a title search, could confirm the association of the property with the Peters, or alternatively, another Hebron farming family. Deed research might also provide a more detailed description of potentially significant lanes, buildings, and other features that once stood on the property.

It is our understanding that the Phase I study has been submitted to State Historic Preservation Office and their review is expected shortly. With regards to the timing of a Phase II Intensive Archaeological Study, it is our understanding that this could be undertaken, subject to weather conditions, in early May 2005 and completed by June 2005.

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4.5 Aesthetic and Visual Resources

The following information regarding cultural and heritage resources has been obtained in part from the *Cultural and Heritage Impact Statement; Horton Property, Hebron-Village Green District* (8/12/2004).

4.5.1 Existing Development Patterns

The existing street, building and open space patterns near the site are reinforced by the proposed development. Office and light industrial development is located within employment areas recommended by the Town Plan. Open space and natural buffers separate residential areas from commercial uses. Old stone walls and tree stands on edge of open fields define the active adults and employment areas. The residential and open space areas provide a transition between commercial uses and existing homes. Preservation of woodland, construction of new single family homes and development of a playground along Kinney Road are uses compatible with the existing neighborhood.

4.5.2 Site and Building Design

Uses occupying the first floor of buildings are selected to encourage pedestrian activity where light spills onto the walkway from inviting storefronts and outdoor café tables fill with dinners when the weather permits. The plan incorporates pedestrian amenities such as crossings made of brick pavers, wide brick sidewalks lined with old-style lamps and Zelkova shade trees. Benches and low stone walls are provided to encourage pedestrians to gather in places where they will not create an obstruction, and the streetscape enlivened with banners, planting beds, and pots.

Most parking spaces are located to the rear and side areas of the buildings to minimize visual impact. Buildings are oriented toward the commons and public streets, which is typical of historic development of rural Connecticut

A community meeting house in the Neighborhood Park provides a gathering place for residents. Homes for active adults (55 years and older) and luxury apartments for adults will be placed around the park. Housing for the elderly (65 years and older) is set into the hillside between Market Square and Neighborhood Park, and conveniently located to the market, shops, restaurants, meeting house, and churches.

4.5.3 Compatibility with Neighborhood

The rural character of Church Street will be maintained by preserving woodland on the hillside, open-fields, stonewalls and trees along edge of the road. The alignment of Kinney Road will be changed to minimize the impact of traffic on this residential street

A rural roadside appearance is created by a planned boulevard with a London Planetree canopy over the roadway, and stonewalls reconstructed on both sides. Walkways meander along the edge of the road connecting Hebron Center, Market Square,

Neighborhood Park, open space areas, recreation facilities, churches, and Hebron Elementary School. Light poles are located between trees to reduce the visual impact on the environment.

4.5.4 Aesthetic and Visual Resources Mitigation

Aesthetic and visual resources will be sustained throughout the project through mitigation measures incorporated in the design. The overall pattern of development for the Village Green District consists of three distinct components: Village Center, Village General, and Village Edge as previously shown in Figure 2-5. The Village Center and Village General are intended to be areas of more concentrated development while the Village Edge is intended to be less densely developed. The Village Edge is intended primarily for residential, civic, recreational, and open space uses. Some of the objectives of the Village Edge are to preserve natural features, accommodate greenways, and create buffer areas along the edge of the Village Green District.

The concept master plan complies with the intended pattern of development by locating shops, services, commercial and retail uses, and a public square within the northeast and north central portions of the district. Multi-family and single family residences are proposed along the southern portion of the site and abutting neighboring residential developments to the south. A large area of open space is proposed along the District's western boundary.

4.6 *Cultural and Heritage Resources*

The following information regarding cultural and heritage resources has been obtained in part from the *Cultural and Heritage Impact Statement, Horton Property, Hebron-Village Green District* (8/12/2004)

4.6.1 **New England Village Atmosphere**

The proposed design and placement of buildings, pedestrian walks and landscaping create an old New England Village atmosphere. Two story commercial buildings around the Market Square will provide a setting for community activities, such as festivals, craft fairs, etc. The building designs use construction details, roof forms and shapes of buildings in the nearby neighborhood Hebron Historic District

The Square has a variety of architectural styles inspired by buildings in the center. Design features reflect Colonial homes with central chimney, clapboard siding and gambrel roof; Federal styles with interlaced arches decorative motifs, hip roof and gable ends oriented toward the road; and Greek Revival style with wide corner pilasters, rectilinear shapes and heavily proportioned moldings.

The proposed development reinforces the scale, massing and proportions of the surrounding historic area by creating the appearance of many separate buildings in a single structure. A clock tower in the corner of the proposed grocery store is the focal point as you approach the Market Square from Main Street. The façade of the store facing the square is consistent with abutting buildings. The service area in the rear of this structure is designed to look like a barn. The stone base ties all the elements of the building together. Changing heights and shapes of roofline make the scale of the building more compatible with other structures.

A new Town Hall is proposed at the end of the square. This will create a meeting place that faces onto the town common that could become the hub of community life as is typical in New England towns.

4.6.2 **Cultural and Heritage Resource Mitigation**

As with the aesthetic and visual resources, the cultural and heritage resources will also be protected and promoted through the design of the project. The proposed Village District Master Plan for Horton Property:

1. Incorporates proposed development with historic cultural landmarks;
2. Preserves and reinforces historic scale, massing, and proportions of buildings;
3. Protects natural features of the site;
4. Complements existing street and open space patterns; and is
5. Compatible with the surrounding neighborhood.

Through these measures the Village Green District will blend the old with the new creating an atmosphere of unity throughout the Town of Hebron.

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4.7 *Community, Institutional, & Recreational Facilities and Services*

The following information regarding community, institutional, & recreational resources has been obtained in part from the *Town of Hebron Plan of Conservation and Development (1/2004)* and *Fiscal Impact Analysis; Horton Brothers, LLC; Village Green District; Hebron, Connecticut (8/23/2004)*.

4.7.1 **Existing Public Safety and Emergency Services and Impact**

The Hebron Volunteer Fire Department (HVFD) is a municipal agency that provides fire, rescue, and hazardous materials response and emergency medical services within the Town of Hebron and to areas of surrounding towns by automatic and mutual aid agreements. The Department operates out of three stations: one located in the northern part of Town, one in the center of Hebron and one in the southern area of Town. Given the elongated layout of the community, this is a logical and efficient layout of fire stations within the Town. This distribution provides not only a quick first response to emergency situations but also allows each station to provide back up for one another.

Company #1 (Center) is located on Main Street, Company #2 (Amston) is located on Deepwood Drive, although a new station is being constructed on Route 85, and Company #3 (Gilead) is located on North Street. A part-time Chief, a part-time Deputy Chief, a part-time Assistant Chief, two career firefighters and eighty-two volunteers staff the Department. Company #1 would provide first response to the Village Green District in an emergency, with backup coming from Company #2.

The Hebron Volunteer Fire Department has three engine tankers, a pumper, a heavy rescue unit, a special services unit, a multi-service unit, a fire police unit, a six-wheel drive all-terrain vehicle, a water/ice rescue boat, and a forestry vehicle.

The Emergency Medical Services (EMS) is coordinated by the HVFD. The HVFD provides 24-hour, first responder ambulatory service as well as basic life support with the service of approximately 30 Emergency Medical Technicians (EMTs). First response regional coverage is provided to Hebron by the Town of Colchester in the Old Hartford Road area. Hebron's EMS department is state licensed and each EMT must achieve and retain certification for BLS services. EMTs either report directly to a call or to the ambulance at Company #1. A number of EMTs carry defibrillators and oxygen with them to ensure availability of such equipment for use at the scene. Paramedics, dispatched from regional area health care facilities, provide for more advanced medical care. The HVFD EMS has a single ambulance and is planning for a second ambulance when the town's population exceeds 10,000.

The Town provides twenty-four hour a day police protection through a Resident State Trooper, seven part-time Hebron Police Officers and state troopers from Troop K assigned to respond to calls in Hebron. The Department of Police Services provides a full range of services including emergency response, criminal and accident investigation,

crime prevention and community service projects. The police services are based at the Company #1 firehouse and have two squad vehicles.

The current public safety and emergency services are believed to be adequate for the expansion created by the project.

4.7.2 Existing Public Works Department and Impact

The town employs fourteen full-time employees in its public works department and one part-time employee at the transfer station during the week and weekend. Services provided by the department include road maintenance and reconstruction, solid waste disposal, snow and ice removal, maintenance of town buildings and grounds, animal control, trail maintenance and construction, vegetation control, vehicular maintenance, site improvement and construction activities, and drainage maintenance and improvements.

The Town will be responsible for the maintenance of public roads within the Village Green District. At this time it is anticipated that maintenance will be needed for the main road and the road to the industrial area but not the private roads around the apartment or the commercial parking lots. The maintenance of the driveways and parking lots around the apartments and condominiums will be paid for by the owner and the condominium association. The same is true for the trash removal for the entire project. With commercial properties, the owner, not the Town, pays for trash removal and parking lot and driveway snow removal and maintenance.

According to Andrew J Tierney, the Hebron Public Works Director, the current public works department will be able to handle maintenance of public improvements within the Village Green District. The design and construction will be monitored, specifically on the public roadways and the boulevard in order to ensure that there will be no negative impacts.

4.7.3 Existing Educational Resources and Impact

Hebron's public school system is comprised of two elementary schools, a regional middle school, and a regional high school.

It is expected that with the addition of six single family houses, and forty-nine non-age-restricted apartments that there will be an increase of fifteen students. At roughly \$6,581 per student that is paid from local property tax dollars, this will cost the town an additional \$98,715 per year. As shown in Table 4-2, even if all the students went to the same school, there is room for them.

Table 4-2: Public Schools in the Town of Hebron

School	Address	Grade	Enrollment 10/1/03	Hebron Enrollment	Capacity
Gilead Hill School	580 Gilead St., Hebron	preK-3	565	n/a	665
Hebron Elementary School	92 Church St., Hebron	4-6	584	n/a	725
RHAM Middle School	67 RHAM Rd , Hebron	7-8	542	290	750
RHAM High School	85 Wall St., Hebron	9-12	1,035	515	1,200

Source: *Fiscal Impact Analysis, Horton Brothers, LLC, Village Green District, Hebron, Connecticut* Stewart Appraisal Services August 23, 2004 (Data from October 2003)

4.7.4 Existing Recreational Resources and Impact

Public amenities are part of the Open Space Standards in the Master and Concept Plan for the Village Green District. The proposed plan has public open space for outdoor activities, preserves natural features, protects wetlands and maintains natural buffers for adjacent uses. A new Town Hall adjacent to Market Square and the meeting house in the Neighborhood Park create focal points within the proposed development. A fitness center, playfields, court games, playground and walking trails provide recreation opportunities for residents and employee’s in the Hebron Center area. All of these amenities will be new recreational resources available to the entire community.

4.7.5 Existing Ancillary Business and Impact

The Hebron Zoning Regulations 5 10.4(c)(4)iv, address the “impact of ancillary business to be generated in existing business centers by the population of visitors to the project, and the demand for ancillary development to be generated.” In other words, the impact the new residents and shoppers/employees in the new living units, stores, and offices will have on the existing businesses in Hebron Center will be positive. The addition of 170 people within walking distance of Main Street will generate more shoppers and users of the existing stores and restaurants along Main Street. Adding commercial development will also increase the overall number of shoppers to both the businesses in the new project and the existing businesses in Hebron Center. Good commercial development generates new commercial development and activity since new businesses want to be near other businesses to capture some of the traffic. With additional businesses and increases in the number of shoppers, the area will become a center for multiple services (work, grocery, restaurant, miscellaneous retail, etc). Adding the subject project will create a shopping and work village that people will go to rather than traveling to Manchester or Glastonbury or Colchester.

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4.8 *Air Quality*

The following information regarding air quality has been obtained in part from the *Natural Resources Inventory and Impact Assessment, Hebron Village Green, Hebron, Connecticut* (8/24/2004).

4.8.1 Existing Environment

The *Conservation and Development Policies Plan for Connecticut* recognizes that Connecticut has seen major improvements in air quality over the past twenty years. However, additional effects of air pollution are being identified, and new concerns are emerging that will require greater control efforts. Balancing air quality gains with the costs of such controls and the ability to provide for economic development is a critical planning concern.

4.8.2 Analysis of Impact on Air Quality

The intended uses of the Village Green District (i.e. mixed-use business, light industrial, and residential) are not anticipated to significantly impact air quality. Temporary adverse air quality impacts may occur in the immediate vicinity of the project due to exhaust emissions from construction equipment and dust produced by construction activities. Construction equipment exhaust emissions will be negligible when compared to those produced by normal traffic flow in the vicinity of the town center. Generation of dust from construction activities can be mitigated by including dust control requirements in the Erosion and Sediment Control Plans. All of these impacts are of short duration and will cease with the completion of the construction phases of the project.

Increases in Hebron Center traffic as a result of development are not anticipated to increase carbon monoxide levels substantially. Since high levels of carbon monoxide are typically associated with areas of heavy traffic congestion, the project is not anticipated to have an adverse impact on air quality in Hebron center.

In addition, the layout of the Village Green area provides accommodations for alternative modes of transportation, such as bicycles and pedestrians, in order to reduce the impact to air quality from mobile source emissions.

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4.9 Noise

The following information regarding noise has been obtained in part from *Regulations of Connecticut State Agencies (RCSA); Title 22a; Section 22a-69-1 to 22a-69-7 4; Control of Noise* (July 22, 2002).

4.9.1 Existing Environment

Section 22a-69 of the Connecticut General Statutes gives the Commissioner of Environmental Protection the authority to develop, adopt, maintain and enforce a comprehensive statewide program of noise regulation, including:

1. Controls on environmental noise through the regulation and restriction of the use and operation of any stationary noise source;
2. Ambient noise standards for stationary noise sources that, in the Commissioner's judgment, are major sources of noise when measured from beyond the property line of such source;
3. Consultation with State and local governmental agencies when such agencies adopt and enforce codes, standards, and regulations dealing with noise insulation and abatement for any occupancy or class of occupancy; and
4. Controls on airport and aircraft noise to the extent not preempted by federal law.

Sections 22a-69-1 to 22a-69-7 4 of the Regulations of Connecticut State Agencies set forth the statewide program of noise regulation. The Village Green District is categorized as both a Class A & B Land Use. The Class A Land Use category includes those shown in Table 4-3.

Table 4-3: Class A Noise Zone

Residential Household Units, Group Quarters, Mobile Home Parks and Courts, Other Residential
Trade Residential Hotels, Hotels, Tourist Courts and Motels, Transient Lodgings
Services Medical and Other Health Services/Hospitals, Correctional Institutions, Religious Activities
Cultural, Entertainment and Recreational Cultural Activities, Nature Exhibitions, Historic and Monument Sites
Undeveloped, Unused and Reserved Lands and Water Areas Reserved Lands, Vacant Floor Area-Residential

The regulations indicate that no person in a Class A Noise zone shall emit noise exceeding the levels stated in Table 4-4.

Table 4-4: Class A Emitter to Designated Receptor

C	B	A/Day	A/Night
62 dBA	55 dBA	55 dBA	45 dBA

The Class B Land Use category includes those shown in Table 4-5.

Table 4-5: Class B Noise Zone

Transportation, Communication and Utilities Automobile Parking, Communication
Trade Wholesale Trade, Retail Trade (Building Materials, General Merchandise, Food, Automotive Dealers and Gasoline Service Stations, Apparel and Accessories, Furniture, Home Furnishings and Equipment, Eating, Drinking and Lodging)
Services Finance, Insurance and Real Estate Services, Personal Services, Business Services, Repair Services, Professional Services, Government Services, Educational Services, Miscellaneous Services
Cultural, Entertainment and Recreational Cultural Activities and Nature Exhibitions, Public Assembly, Amusements, Recreational Activities, Resorts and Group Camps, Parks
Agriculture Agriculture , Agricultural Related Activities
Undeveloped, Unused and Reserved Lands and Water Areas Undeveloped and Unused Land Area, Water Areas, Vacant Floor Area, Other Undeveloped Land and Water Areas

The regulations indicate that no person in a Class B Noise zone shall emit noise exceeding the levels stated in Table 4-6.

Table 4-6: Class B Emitter to Designated Receptor

C	B	A/Day	A/Night
62 dBA	62 dBA	55 dBA	45 dBA

Levels emitted in excess of values listed above are considered to be excessive noise

While no site-specific noise monitoring data has been collected for the proposed project, the proposed land use is similar to that which exists on adjacent properties

4.9.2 Analysis of Noise Impact

Noise levels at the proposed project site over the long term will be typical of other settings near the Village Green District and no long-term noise related impacts are expected. The primary short-term noise concerns relate to construction and demolition activities and their potential to generate unacceptable levels of noise from construction vehicles and equipment engaged in land clearing operations, demolition, excavation (perhaps blasting), delivery, and construction.

Noise attenuation will be accomplished through compliance with policies of the Town of Hebron, including restricted hours of operation and limitations regarding work on weekends. Construction activities will be limited to the daytime, when rush hour traffic is at higher levels. The additional traffic and construction related noise is anticipated to be minimal in this environment.

4.10 *Water Quality and Resources*

The following information regarding water quality and resources has been obtained in part from the *Town Center Stormwater Management Study; Town of Hebron, Connecticut* (2/8/2005), the *Natural Resources Inventory and Impact Assessment; Hebron Village Green; Hebron, Connecticut* (8/24/2004) and *Property of Horton Brothers, LLC; Hebron Connecticut; Village Green District; Public Works Impact Statement; Stormwater Systems, Lighting, Parking, Wastewater* (8/2004).

4.10.1 **Stormwater**

A project of this magnitude has the potential for several impacts to the onsite and offsite wetland and watercourse systems. An enumeration of these impacts, in the *Town Center Storm Water Management Study for the Town of Hebron*, is as follows:

1. Accumulation and transport of soluble and particulate pollutants to surface waters, both from impervious surfaces and managed pervious surfaces.
2. Decline in stream bed quality and degradation of instream habitat.
3. Transport of higher temperature runoff directly to surface water (thermal impacts).
4. Lower diversity of aquatic species.
5. Increase in peak discharges of stormwater runoff
6. Increase in volume of stormwater runoff.
7. Decrease in the time in which stormwater runoff reaches wetlands or surface waters.
8. Increased frequency in duration of time which a watercourse experiences certain discharge rates.
9. Increased velocities of flow within stream channels.
10. Stream channel instability (channel widening, channel bed downcutting, aggradation and/or degradation).
11. Sediment deposition.
12. Increase in peak discharges of stormwater runoff beyond the capacity of natural channels and manmade conveyance systems and structures.
13. Flood plain expansion

As enumerated in Section 1.4 of the *Town Center Storm Water Management Study for the Town of Hebron*, the following applicable stormwater management controls are considered in the development of the Master Concept Plan and Design Standard (MCP & DS) and must be considered in the design of each individual site plan.

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Table 4-7: Stormwater Management

Land Use Controls	Source Controls	Treatment Controls
Stream Buffer Requirements	Public Education	Settling Practices
Floodplain Restrictions	Illicit Discharge and Connection	Infiltration Practices
Wetland Protection	Spill Prevention and Clean-up	Filtering Practices
Steep Slope Area Restrictions	Dumping Prevention	
Open Space	Materials Management	
Cluster Development	Street and Parking Area Cleaning	
Soil Erosion and Sediment Control	Storm Drainage System Maintenance	

As enumerated in the Town Center Stormwater Management study, the following is a list of the controls used in land development design practices:

Table 4-8: Controls Used in Land Development Design Practice

Storage Control	Infiltration Controls	End-of-Pipe Controls
Rooftop Storage	Lot Grading to Create Ponding Areas	Oil/Grit Separators
Parking Area Storage	Roof Water Collection and Infiltration	Dry Ponds
Storm Sewer Storage	Vegetated Swales or Channels	Wet Ponds
Detention Facilities	Vegetated Buffer Areas	Constructed Wetlands
Retention Facilities	Infiltration Storm Sewers	Filtering Practices
	Infiltration Basins or Structures	Infiltration Practices

4.10.2 Surface Water Resources

The Hebron Village Green project site is situated within the Raymond Brook watershed (DEP# 4701) which is part of the Salmon Regional Basin. Raymond Brook is a second order tributary to Jeremy River. The site is located mainly within the upper watershed area of the 8.6 square mile Raymond Brook drainage basin. Figure 4-4 is a location and topographic map of the Village Green District site location as well as showing the Raymond Brook watershed.

Site drainage will be directed to one of three drainageways on the property. A perennial watercourse along the western side of the property drains southerly to Raymond Brook. Runoff from the easternmost side of the property drains to a tributary of Raymond Brook along Mill Stream Road. The central portion of the property drains to a wetland and associated intermittent watercourse that also flows in a southerly direction to Raymond Brook.

Since the watercourses on the property are located within the headwaters of the drainage basin, flows emanating from the property would likely be quite variable. Flows would be their highest from late fall to early spring, when limited evapotranspiration results in soil saturation and wetland discharges within the glacial till soils. Base flows during the dry summer months are expected to be low and not supportive of the viable fisheries habitat. However, these headwater streams provide an important source of cool, clean water to downstream fisheries associated with the larger receiving watercourses.

According to the *Adopted Water Quality Classifications for the Connecticut River Basin*, the watercourses on and adjacent to the site are classified as Class A surface waters. This designation indicates that this is uncontaminated surface water suitable for recreational

use, fish and wildlife habitat, agricultural and industrial supply, and potential drinking water supply.

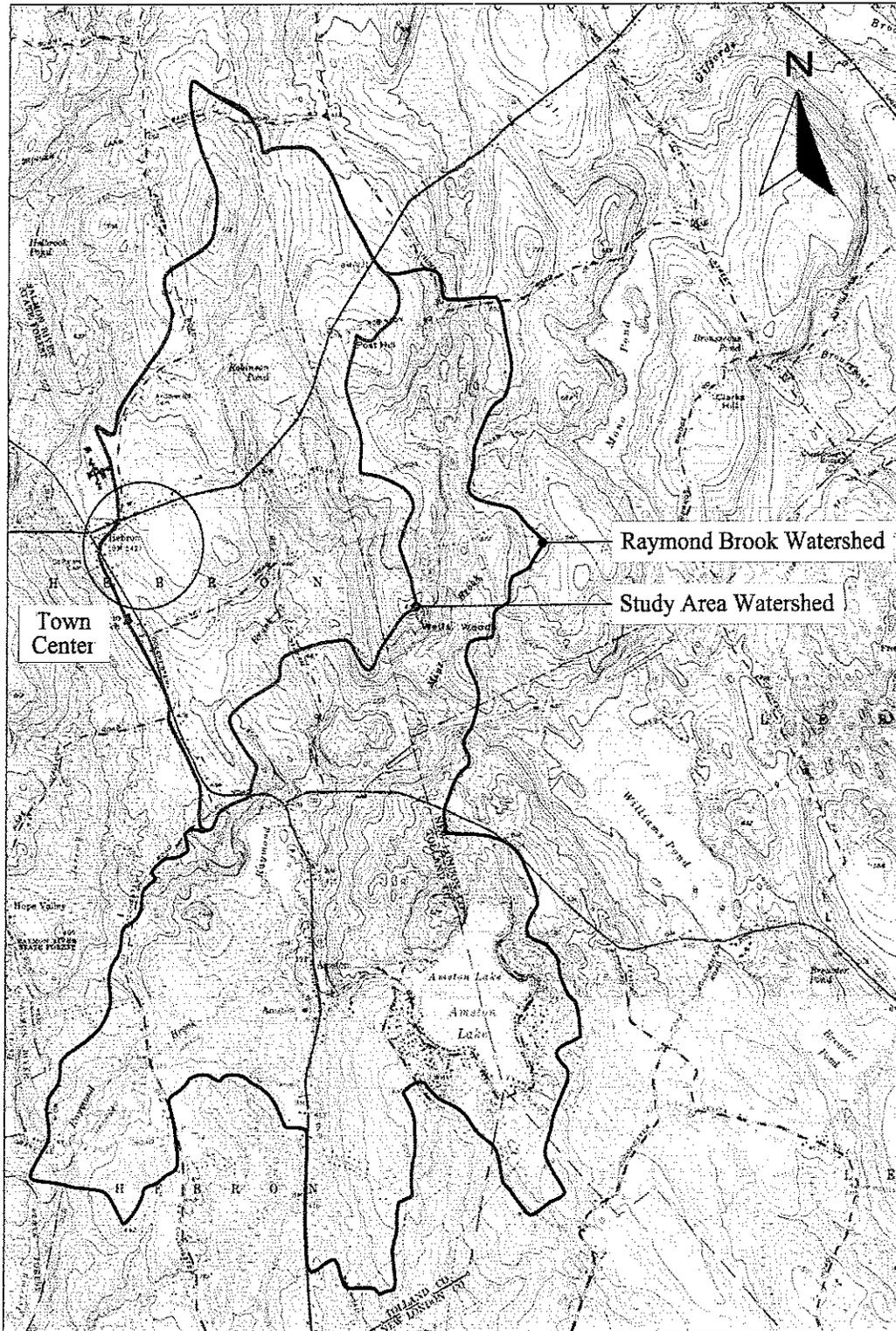


Figure 4-4: Raymond Brook Watershed and Site Location Map
Source: USGS Columbia and Colchester Connecticut Quadrangles

4.10.3 Groundwater Resources

There are no stratified drift deposits of soil on the property capable of supplying large quantities of groundwater. The glacial till soils found on the property do not possess the ability to supply a significant source of groundwater. With most till uplands, water resources are mainly available from bedrock wells.

The groundwater beneath and in the vicinity of the site is classified as GA and GAA. Class GA groundwaters are presumed suitable for direct human consumption without the need for treatment. Class GAA waters are groundwaters contributing to existing public water supply wells.

4.10.4 Analysis of Impact on Water Quality and Resources

The drainage standards of the Village Green District as presented in the Master Concept Plan and Design Standards dictate the minimization of impacts from stormwater discharges. Post-development peak run-off rates leaving the development must not exceed pre-development rates. Drainage designs must include components that treat stormwater to remove pollutants prior to discharge into the natural systems. Stormwater control features must be functional, environmentally sensitive, and where visible, must be aesthetically pleasing. Mitigation via erosion and sediment control and stormwater treatment is anticipated to abate any potential minor impacts.

The drainage systems will contain both structural and non-structural components to detain and treat runoff from developed portions of the site. The use of natural systems to treat runoff such as grassed swales, depressed parking islands, and water quality basins will be utilized where feasible.

Development of the Village Green will result in an increase in impervious surfaces which will result in increases in stormwater runoff. Increases in impervious surfaces and stormwater runoff can have adverse effects on wetlands and water courses, including changes in stream hydrology, stream morphology, water quality, and fish and wildlife habitat. The relationship between increases in imperviousness and water resource impacts has been documented in the research findings of the Center for Watershed Protection and is presented in a general watershed planning model known as the Impervious Cover Model. The Impervious Cover Model predicts that most stream quality indicators decline when watershed impervious cover exceeds 10%, with severe degradation expected to occur with 25% impervious cover (Center for Watershed Protection, 2003).

Nathan L. Jacobson & Associates prepared a *Town Center Stormwater Management Study for the Town of Hebron (2/8/2005)*. The study area encompasses the upper region of the Raymond Brook watershed which includes the Village Green District. According to the findings, it is estimated that less than 3.4% of the 3.21 square mile study area watershed is covered by impervious surfaces.

Build-out of the concept master plan for the Village Green would result in the creation of about twenty-three acres of impervious surfaces or about 17% of the Village Green District. Based on current zoning regulations, the Stormwater Management study estimates that future land development within the study area watershed would yield an increase in total imperviousness to 8% over the entire study area watershed.

The overall sub-watershed area imperviousness is predicted to remain below the 10% threshold predicted by the Impervious Cover Model where stream quality indicators are expected to decline. However, stringent stormwater management measures will be needed to protect water resources within the Village Green District. Some of the stormwater management guidelines that will be implemented in the Village Green District to protect water quality, wetlands, and fish and wildlife habitat are outlined below.

- The overall site design will cluster development in those areas most suitable for development and away from sensitive wetland and watercourse systems.
- Wetland areas and natural floodplains will be preserved
- Buffers will be maintained between the development and wetland/watercourse habitats.
- Large areas of open space will be preserved.
- Existing drainage patterns will be maintained.
- Development will be phased to limit the area of disturbance in order to reduce potential erosion and sedimentation impacts.
- An erosion and sediment control plan will be developed and implemented that controls runoff during construction, provides erosion and sediment control structures, and emphasizes rapid re-establishment of vegetative stabilization.
- Both structural and non-structural best management practices (BMPs) will be designed and constructed for stormwater management. These measures will include sheet flow to parking lot islands and road shoulders, subsurface stormwater detention and recharge systems, catch basins with two foot sumps, swirl concentrators, water quality basins, vegetated swales for conveyance and treatment, and landscaping to enhance stormwater treatment such as depressed parking lot islands and rain gardens. Infiltration systems will be used to accept roof drainage where feasible.

The control of stormwater quality, that is, the removal of contaminants from stormwater prior to discharge to receiving waters, is accomplished by a combination of facilities and BMPs. These include discharge of runoff as sheet flow, rather than as a point source discharge; the use of vegetated buffer areas to filter stormwater before it reaches a watercourse; the use of swirl concentrators; the use of biofiltration to filter contaminants; and, the use of constructed wetlands to polish the discharge.

The principal contaminants of concern from development are suspended solids, oil & grease, and heavy metals from parking areas, and to a lesser degree nutrients and pesticides from landscaped areas. Heavy metals are typically adhered to solids, so control of solids generally results in control of heavy metals as well. Control of oil & grease is

accomplished by the use of swirl concentrators equipped with features for trapping “floatable” debris and by filtration.

The numerous swirl concentrators are used to treat stormwater from the roads and from parking lots. These are manufactured structures designed to trap road sand and floatable debris. They include internal hydraulic controls to collect and treat the so-called “first flush” of stormwater (typically from the first one inch of rainfall) and to bypass excess stormwater resulting from more than an inch of rainfall.

The preservation or creation of vegetated buffers adjacent to wetlands and watercourses is an effective means of treating stormwater runoff through physical settling and vegetative filtering. Since most pollutants are adsorbed to sediments, the trapping of sediments within a buffer removes pollutants such as nitrogen, phosphorus, and heavy metals. Chemical and biological processes in the soil, in turn, transform nitrogen and other pollutants into less harmful forms. Buffers also act as sinks when nutrients are taken up by root systems and stored in vegetative biomass.

Research has shown that nearly ninety percent of all runoff contaminants occurs during storm’s one inch of rainfall or less. Water quality basins will be designed to treat the first one inch of runoff and thus have the capability of capturing and removing most of the contaminants associated with stormwater runoff entering the basins. The water quality basins are designed to function in much the same way processes occur in the natural environment by reproducing the physical, chemical, and biological processes. These processes include the capture of runoff by plants and soils; the downward migration and filtering of runoff through the soil; the settling out of suspended particles; evaporation and transpiration of captured runoff; absorption of water in soil pores and subsequent plant uptake; assimilation of nutrients by plants; adsorption of dissolved nutrients and other pollutants to soil; nitrification, denitrification, and volatilization of nitrogen compounds; thermal attenuation of heated runoff from paved surfaces; and microbial degradation and decomposition of chemical and organic compounds.

Vegetated swales function by collecting, holding, and filtering runoff. Much like water quality basins, natural processes remove sediments and chemical and organic compounds from runoff. Runoff is filtered by the vegetation and by underlying soils as it infiltrates the bottom and sidewalls of the swale.

If needed in the future, the site’s bedrock aquifer is likely suitable for supplying adequate water for small to moderate residential and business uses. However, at this time there are no plans for additional wells to be drilled. For additional analysis of the measures taken to protect the groundwater see §4.14 Pesticides, Solid Waste, Recyclables, and Hazardous Waste.

In addition, any industrial wastewater discharge to either groundwater, surface water, or the municipal sewer system will require permitting and pretreatment, as appropriate, and, if directed to the municipal sewer system, must be amenable to the biological treatment processes at the sewage treatment plant.

4.11 Natural Land Resources and Formations

The following information regarding natural land resources and formations has been obtained in part from the *Natural Resources Inventory and Impact Assessment; Hebron Village Green, Hebron, Connecticut* (8/24/2004).

4.11.1 Compatibility with Natural Resources

The proposed development protects natural features and rural character of the Town.

Wetlands are protected by a development setback of fifty feet or more. A natural landscape will help to reestablish areas disturbed within the setback. Meadow grass and wildflower seed mixes stabilize slopes. Red Oak, Green Ash, Norway Spruce, and White Pine are planted adjacent to proposed development. Wet meadow grass and flowers are planted in detention basins along the edge of the wetlands. Red Maple, White Pine, Shadblow, Highbush Blueberry, and Winterberry create a wetland habitat around detention areas. Impact on wetlands is minimized because a natural landscape does not have to be mowed, irrigated, or fertilized.

Disturbance of wetlands is limited to three road crossings. The roads are designed to minimize impact on wetlands. Restoration of wetland areas disturbed by farming is proposed to mitigate for road crossings.

Old cart paths with stone walls and trees on both sides are utilized for trails that cross wetlands.

4.11.2 Topography

The topography of the Village Green District (VG) was carved by the passage of the last Ice-Age glacier. Glacial erosion tends to form a relatively streamlined surface which allows easier passage of the ice mass. Hence the topography is relatively subdued with nearly flat or gentle slopes. The elevated northeast portion of the property is relatively flat. Slopes drop off to the south, east, and west from this elevated plateau. Moderately steep slopes are found along the east and south slopes of the knoll on the eastern portion of the property. This knoll contains the highest elevation on the property, at approximately 620 NGVD. The low point is located at the property's southwest corner with an elevation of approximately 400 NGVD. The gentle topography within the proposed developed portion of the site should not present a significant restriction with respect to site development.

4.11.3 Bedrock Geology

Canterbury Gneiss underlies the majority of the property. This metamorphic rock is light-colored foliated gneiss composed of potassium, feldspar, quartz, and biotite mica. The bedrock foliation strikes southwest and dips 15-20° northwest. Occasional outcrops of

bedrock are found on-site, particularly on the moderately steep east facing slope of the knoll facing Mill Stream.

4.11.4 Surficial Geology

Surficial deposits of the Columbia Quadrangle (Hebron VG is located in the NW/4 of the SW/4 of the quadrangle) were mapped by Zizka (1978), who showed that the entire area of the proposed expansion is covered by "glacial till" of variable thickness; the till is thin, however, on the steep slopes adjacent to Mill Stream. Glacial till is poorly sorted mix of clay, silt, sand, gravel, and rocks deposited by glaciers during the last ice age.

Upland Soils

Deep well-drained soils, identified by the Soil Conservation Service (SCS) as Charlton fine sandy loam, are found mainly in the eastern portion of the site. These soil types are suitable for most types of development and present little in the way of limitations.

Paxton fine sandy loam and Hollis fine sandy loam are found mainly in the southern portion of the site. Both of these soils are well-drained but present some restrictions to development. The Paxton soils have a dense hardpan layer at about 18-30 inches below grade. The hardpan restricts downward drainage, and requires special precautions to address potential erosion and drainage problems. The Hollis soils have bedrock at shallow depths which may require blasting for excavations.

Woodbridge and Sutton fine sandy loam are found throughout the site and cover large areas on the west side of the property. These are moderately well drained soils that possess a seasonal high water table at about 18 inches. Special precautions are required when developing these soils to control groundwater and prevent erosion hazards.

Wetland Soils

Wetland soils on the project site are identified by the SCS as Ridgebury, Leicester and Whitman fine sandy loams. These poorly to very poorly drain soils occur on wet hillside seeps and in low lying drainageways of the site. They are typically saturated to the surface or possess shallow inundation from late fall to early spring.

4.11.5 Analysis of Impact

No extensive filling or re-grading will be necessary to develop the project site for the proposed Village Green District. Following review of the pertinent geologic information and field investigation, the potential for significant impacts to the physical environment of the project site is not evident. Additionally, existing soils should not present any significant limitations with respect to the construction of the contemplated structures.

4.12 *Biological Environment*

The following information regarding the biological environment has been obtained in part from the *Natural Resources Inventory and Impact Assessment, Hebron Village Green, Hebron, Connecticut* (8/24/2004).

4.12.1 **Vegetation**

The project area contains a diverse mix of vegetative communities. Past and present agricultural uses of the property have resulted in classic examples of ecological succession throughout the parcel. A mosaic of floral associations results from the presence of cultivated agricultural fields and abandonment of fields over a protracted period of time. Fields that have been abandoned most recently are in the earliest stages of ecological succession and are vegetated primarily by coarse grasses, wildflowers and weeds. Somewhat older fields are vegetated with aggressive pioneer species of shrubs such as multiflora rose and Japanese barberry. The earliest abandoned fields are now vegetated with hardwood stands comprised primarily of red maple, hickory, ash, tulip, locust, and black cherry. An Existing Vegetation Associations map and detailed community descriptions are shown in Figure 4-5.

In a general sense, the property can be viewed as meadow habitat that has been used for agricultural purposes and forested areas. Overall, there is a nearly even mix of forested and meadow/old field habitat on the property. There are approximately sixty-five acres of forested uplands and wetlands and about sixty-seven acres of meadow and old field habitat. Overall, the site's floral communities can be divided into the following categories:

Upland Communities

The **Agricultural Field** community comprises about forty-seven acres. There are total of twelve individual fields. They include a mixture of tilled, hay, mowed, and pastured fields.

Hedgerows are located between individual Agricultural Fields and are typically less than fifty feet in width. The Hedgerows are vegetated primarily with pole and saw-timber size trees comprised of sugar maple (*Acer sacharum*), white ash (*Fraxinus Americana*), black oak (*Quercus vellutina*), red oak (*Quercus rubra*), white oak (*Quercus alba*), black cherry (*Prunus serotina*), hickory (*Carya sp*), sassafras (*Sassafras albidum*), crabapple (*Malus sp.*), eastern red cedar (*Juniperus virginiana*), and red maple (*Acer rubrum*). Wolf-trees (large trees with spreading crowns) are commonly found within the hedgerows. The transition from field edge to wooded hedgerow is vegetated with dense shrub and vine growth comprised of multiflora rose (*Rosa multiflora*), speckled alder (*Alnus rugosa*), Japanese barberry (*Berberis thunbergii*), autumn olive (*Eleagnus angustifolia*), poison ivy (*Toxixodendron radicans*), grape (*Vitis sp*), and bittersweet (*Celastrus scandens*).

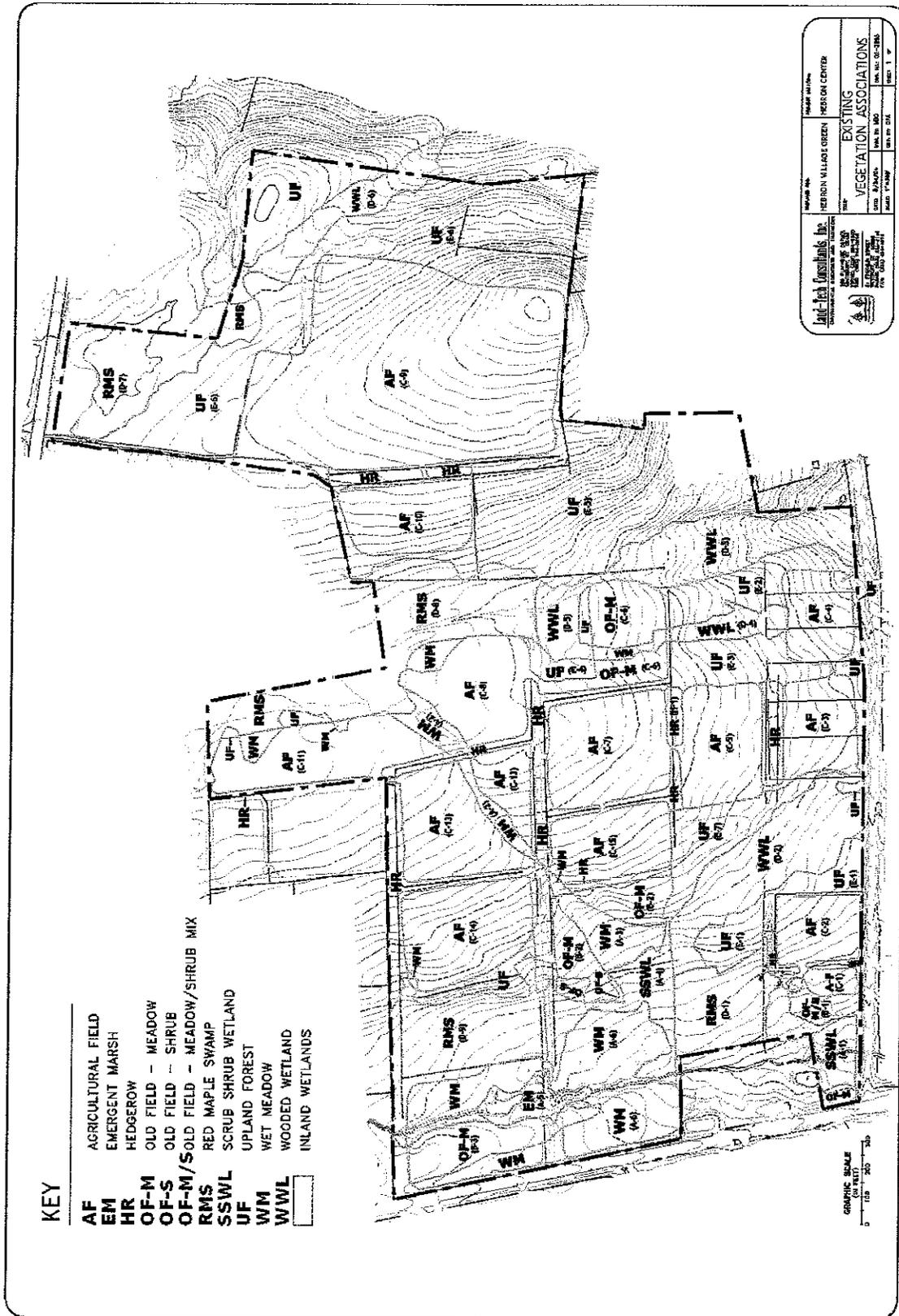


Figure 4-5: Existing Vegetation Associations Map

Approximately twenty acres of the site consists of recently abandoned agricultural fields. These fields are in varying stages of **Old Field Succession** as pioneer vegetation colonizes these areas. These youngest fields are vegetated with a variety of grasses and wildflowers such as goldenrod (*Solidago sp.*) and milkweed (*Asclepias sp.*). Somewhat older fields are vegetated with a mix of invasive pioneer shrubs such as multiflora rose and Japanese barberry. More advanced stages of Old Field Succession are vegetated with pole-sized red maples, eastern red cedar, white pine (*Pinus strobus*), choke cherry (*Prunus virginiana*), white ash, and crabapple.

Forested Upland Communities, including the hedgerows between fields, comprise about thirty-eight acres of the site. The larger, more contiguous areas of forested habitat are found primarily on the eastern portion of the property. They contain a mix of deciduous trees such as red maple, sugar maple, black oak, black gum (*Nyssa sylvatica*), tulip (*Liriodendron tulipifera*), ash, American beech (*Fagus grandifolia*), black birch (*Betula lenta*), and black cherry. A fairly sparse understory of shrubs including viburnums (*Viburnum sp.*), highbush blueberry (*Vaccinium corymbosum*), multiflora rose, Japanese barberry, and hardwood saplings is found under the hardwood canopy.

Wetland Communities

Forested Wetlands and Red Maple Swamp communities comprising about twenty-seven acres are found within the lower elevations of the site and on wet hillside seeps. The **Forested Wetlands** are vegetated with a mix of pole to saw-timber size red maple, white ash, American elm (*Ulmus americana*), yellow birch (*Betula alleghaniensis*), and black gum, saplings of red maples, white ash and American beech are found in the understory. Japanese barberry, spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*), speckled alder, and multiflora rose are also found in the understory. The **Red Maple Swamp** communities are found within the wetter portions of the site. They possess pit and mound topography with vegetated hummocks interspersed among seasonally inundated pockets. These communities are dominated by red maple and American elm. The understory is comprised of spicebush, winterberry, and speckled alder. Skunk cabbage (*Symplocarpus foetidus*) is also common.

Low lying drainageways within active and abandoned agricultural fields contain **Wet Meadow** communities. These are vegetated with a variety of grasses, sedges, rushes, and wildflowers.

An **Emergent Marsh** community has developed with an area of abandoned field on the west side of the property as a result of beaver activity in a small stream. This marsh contains groupings of speckled alder, multiflora rose, sweet pepperbush (*Clethra alnifolia*), irises (*Iris sp.*), tussock sedge (*Carex stricta*), and various rushes.

Scrub Shrub Wetlands have developed in some of the wet areas of abandoned fields. These are vegetated with dense impenetrable thickets of multiflora rose, Japanese barberry, wild grape, speckled alder, Russian olive (*Elaeagnus pungens*), and pussy willow (*Salix discolor*).

4.12.2 Analysis of Vegetation Impact

The design standards of the Village Green District include provisions that call for the preservation of stonewalls, hedgerows, specimen trees and barways. As a result of past and present agricultural uses, the site contains numerous stonewalls, hedgerows, and barways. While it would not be possible to preserve all stonewalls and hedgerows, a large percentage of them, especially within the south and west portions of the site will be preserved.

Specimen trees located along wooded hedgerows and within wooded areas at the east and west sides of the site will be located and preserved where possible. The wooded areas on the west side of the site will be set aside as open space, protecting any specimen trees that may reside there. Trees within the wetlands in the central and west sides of the property will also be preserved.

The open space standards of the Village Green District include provisions that call for the incorporation of buffers to preserve natural resources corridors; protect and include watercourses and wetlands; and, provide buffers to adjacent uses. The three major wetlands corridors that traverse the property from north to south will remain intact. These corridors will protect the associated watercourses, protect surface water quality, and provide concealed travel corridors for wildlife movement through the site. Design details for road crossings across the wetland corridors will be evaluated during the Site Plan development phase of the project to incorporate measures that do not hinder wildlife movement and protect the associated water resources.

4.12.3 Inland Wetlands

The site's wetlands are associated with three major drainageways on the property. A large contiguous wetland occupies the westernmost portion of the property and drains into a perennial watercourse that flows southerly to Raymond Brook.

A centrally located wetland drains into an intermittent watercourse that also flows in a southerly direction to Raymond Brook. A narrow wetland, draining southwesterly, interconnects the central and western drainageways.

Wetlands within a drainageway on the eastern side of the property drain to a tributary of Raymond Brook along Mill Stream Road.

Wetlands bordering perennial and intermittent watercourses, such as those found onsite, function to protect these onsite, as well as downstream, water resources. They provide a source of cool water to these headwater streams through soil exfiltration. They provide a buffer to the watercourses, filtering out sediments and other pollutants in overland runoff. And, they provide soil stabilization and some flood control functions.

Wetlands perform many beneficial functions that are not performed by many other ecological systems. Wetlands can provide flood control by attenuating storm flows;

recharge groundwater systems; enhance water quality by filtering out sediment, pollution, and excessive nutrients; provide additional plant diversity; and support wildlife and fisheries. The productivity of a particular wetland is dependent on many factors including, hydrology, size, adjacent resources, topography, and vegetation. These characteristics vary widely and therefore the functions performed by an individual wetland may vary considerably. The recognized functions of inland wetlands are presented in Table 4-9: List of Dominant Wetland Functions, and important functions associated with the wetland system on the subject site are discussed below.

Table 4-9: List of Dominant Wetland Functions

<p><u>Fish and Wildlife</u></p> <ul style="list-style-type: none">• Fish and Shellfish Habitat• Waterfowl and Other Bird Habitat• Furbearer and Other Wildlife Habitat <p><u>Environmental Quality</u></p> <ul style="list-style-type: none">• Water Quality Maintenance• Pollution Filter• Sediment Removal• Oxygen Production• Nutrient Recycling• Chemical and Nutrient Absorption• Aquatic Productivity• Microclimate Regulator <p><u>Socio-Economic Values</u></p> <ul style="list-style-type: none">• Flood Control• Wave Damage or Shoreline Protection• Erosion Control• Groundwater Recharge and Water Supply• Timber and Other Natural Products• Boating• Education and Scientific Research
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Wildlife Habitat

As discussed below in §4.12.4 Fish and Wildlife Habitat the property contains a diverse wildlife population due to the variety of community types available. The inland wetland systems on the property provide wildlife with a diversity of plant species from which to forage and use as cover.

Flood Control

As discussed below in §4.13 Flood Hazard Potential in the wetlands play an integral part in localized flood control.

Water Quality Maintenance/Enhancement

Wetlands improve water quality by retaining or transforming excess nutrients, particularly phosphorus and nitrogen, and by trapping sediments and heavy metals. When stormwater runoff is detained in wetlands, nutrients present in the runoff can be removed via uptake by wetland vegetation, attenuated by soil microorganisms and immobilization by soil chemical interactions. The inland wetlands on the property are densely vegetated and therefore have the capacity to uptake and transform nutrients during the growing season. The riparian wetlands along the watercourse on the west side of the property contain a dense layer of herbaceous and shrub vegetation that take up nutrients.

4.12.4 Analysis of Inland Wetlands Impact

Under the concept master plan for the Village Green District, all development activities other than road crossings are proposed outside of inland wetlands. A total of five wetland crossings are required under the concept plan to gain access to buildable areas on the property and to provide access from Main Street and Church Street. The crossings are located at narrow sections of the wetlands to minimize impacts. Specific designs for each

of the wetlands crossings will be evaluated during the Site Plan development phase of the project to ensure minimal impact and to implement impact mitigation strategies where possible. For the proposed stream crossings that are associated with the perennial water courses, the designs should incorporate the use of natural bottom culverts.

The original Master Concept Plan had envisioned the roadway being connected to Church Street northerly of where it is now. Following a review of field located wetlands, alternatives were researched. The alignment as shown on the Applicant's Master Concept Plan was seen as having the least impact while still preserving the proposed transportation function.

Other wetland protection guidelines that will be implemented for the Village Green development include the following:

- The preservation of wetland and watercourse buffers will be used to protect wetlands from construction and post development activities. A series of bioremediation basins will be incorporated into the buffer between the Village Center development and wetlands to the northeast. The basins will act as sediment basins during construction to protect the wetlands from sedimentation impacts. The basins will also provide for advanced bio-filtration of stormwater discharges from the developed Village Center site.
- Large areas of open space, incorporating wetlands and watercourses, will be set aside to preserve habitat for wetland dependant species. Approximately seventy-eight acres of open space will be preserved under the Master Plan. This represents about 53% of the overall 148 acre site.
- A comprehensive stormwater management plan that utilizes best management practices to protect wetlands and water resources will be designed and implemented.
- A comprehensive erosion and sediment control plan will be designed and implemented to protect wetlands and watercourses from sedimentation impacts.

4.12.5 Fish and Wildlife Habitat

While the site's watercourses are too small or intermittent to harbor significant populations of fish, the site's wetlands and watercourses form the headwaters of Jeremy Brook, which has been identified as a cold water stream capable of supporting trout and Atlantic salmon. Protection of the onsite wetlands and watercourses from development impacts including stormwater discharges and erosion and sedimentation must be carefully evaluated in order to protect these downstream resources.

The presence of open fields, mixed old field succession, mature canopied woodlands, wetland areas, and watercourses on and adjacent to the property, provide a diverse assemblage of habitats. The mosaic of floral communities creates an abundance of "edge" habitat, which tends to enhance wildlife use. Dense shrub thickets provide abundant escape cover and food sources for wildlife. Wildlife species expected to make use of the site are those that are common to rural and suburban settings.

As described above, the past agricultural disturbance on the property has created a diversity of floral habitats from early to late-successional stages. This floral diversity allows for a greater number of wildlife species to be supported when compared to a monoculture or one community type.

The meadow/old field community on the property is suitable for species such as meadow voles (*Microtus pennsylvanicus*), various species of mice, and snakes such as garter snakes (*Thamnophis sirtalis*). The wooded areas are suitable for many species of mammals such as the white-footed mouse (*Peromyscus leucopus*), short-tailed shrew (*Blarina brevicauda*), eastern chipmunk (*Tamias striatus*), and other species preferring the thick canopy and dead fall of the forest.

The ecotonal edge habitat created by the interface of these two communities (meadow/old field) creates suitable habitat for species utilizing the dense cover for protection and open area for foraging. Species utilizing this edge habitat include white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridans*), striped skunk (*Mephitis mephitis*), and numerous songbirds.

The site's wetlands provide habitat for certain reptiles and amphibians. Reptiles and amphibians are ectothermic, meaning that they cannot produce internal body heat and rely on external sources of heat to maintain their metabolism. Therefore, these organisms must actively regulate the amount of heat that reaches their skin. They do this by basking on rocks or in meadows to warm up or hide under logs or in tunnels to cool off. Due to this requirement, they need a variety of habitats nearby. In addition most amphibians (redback salamanders being a regional exception) require standing water to incubate their eggs and live out the larval stage of their life cycle. Typically, two months of standing water and a depth of six to eight inches are required for egg hatching and larval development.

Redback salamanders (*Plethodon cinereus*) are the exception to regionally found salamanders in that they are completely terrestrial and do not require a standing water body in order to reproduce. This species is very common in the area and is typically found in damp/moist areas usually under logs or rocks. The cool crevasses of the abandoned buildings may also provide suitable areas to regulate their body temperatures and hide from predators.

The xeric (dry) to mesic (moderately dry) meadows and ecotonal woodland buffers along with the rock outcrops provide suitable habitat for snakes on the property. The thick vegetation of the riparian community provides cover and access to water. The proximity to open meadow communities and the creek bed during low tide provides areas for snakes and turtles to bask and forage.

4.12.6 Analysis of Fish and Wildlife Habitat Impact

As with any development there will be a loss of some wildlife habitat associated with the development project. However, the preservation of large areas of open space will mitigate

these impacts by providing habitat for wildlife at the Village Green. The development pattern of the concept master plan preserves intact corridors of habitat to allow wildlife movement through the property from north to south. The preservation of stonewalls and hedgerows within developed areas will provide additional wildlife habitat and preserve the "edge" habitat that is currently used by wildlife. Since the site has been used over the years for agriculture, there are no large unfragmented habitats on the property. Thus, the concept master plan will not result in habitat fragmentation.

Downstream fisheries resources will be protected by preserving wetland habitats, providing wetland buffers, and implementing best management practices to control erosion and sedimentation during development and to manage and treat post development stormwater run off.

4.12.7 Species of Special Concern

A review of the Connecticut Department of Environmental Protection's Natural Diversity Database (CT DEP Environmental Data 2002 edition) indicated that no protected or special concern species are known on or within ½ mile of the subject parcel.

A memorandum from the CT DEPT Office of Environmental Review dated February 9, 2004 confirms that the Natural Diversity Database contains no records of extant populations of Federally listed endangered or threatened species or species listed by the State as endangered, threatened, or of special concern at the project site. The memorandum also states however that there are reports of the eastern box turtle (*Terrapene Carolina*), a State species of special concern, nearby. Eastern box turtles inhabit old field and deciduous forest habitats such as those found onsite. They are often found near streams and ponds. Adults are completely terrestrial and hibernate underground from October to April. Juveniles may be semi-aquatic. Eastern box turtles have small home ranges and usually inhabit the same area for many years. The principal threat to this species is loss of suitable habitat.

4.12.8 Analysis of Species of Special Concern Impact

The following information regarding water quality and resources has been obtained in part from the *Eastern Box Turtle Habitat Survey* (1/26/2005). An eastern box turtle survey could not be fully conducted because of seasonal weather conditions. However, a field survey was completed by Richard Snarski, PWS, CPSS, to identify those areas on the site which are potential habitat areas for the eastern box turtle. The map shown in Figure 4-6 delineates those areas that would typically be preferred habitat areas in red. It is worthwhile to note that most of the areas identified as preferred habitat is within the area which is not proposed to be developed, as shown in Figure 4-7. It is recommended that an eastern box turtle survey could be conducted after May 2005, specifically within those areas classified as potential habitat areas. If eastern box turtles are found onsite, specific conditions such as habitat preservation, construction scheduling, etc. will be evaluated and incorporated into the Site Development Plan where applicable.

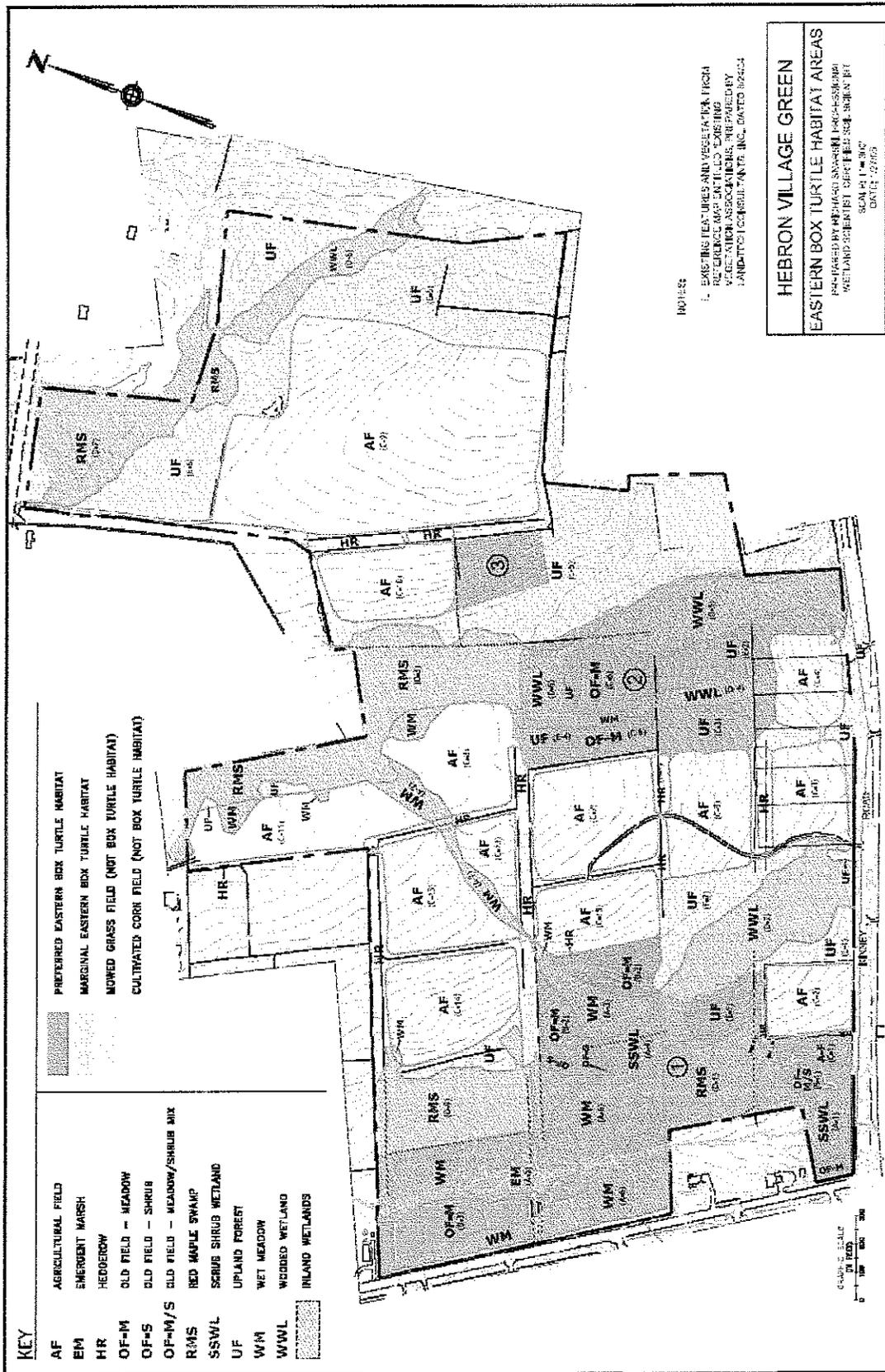


Figure 4-6: Eastern Box Turtle Habitat Areas

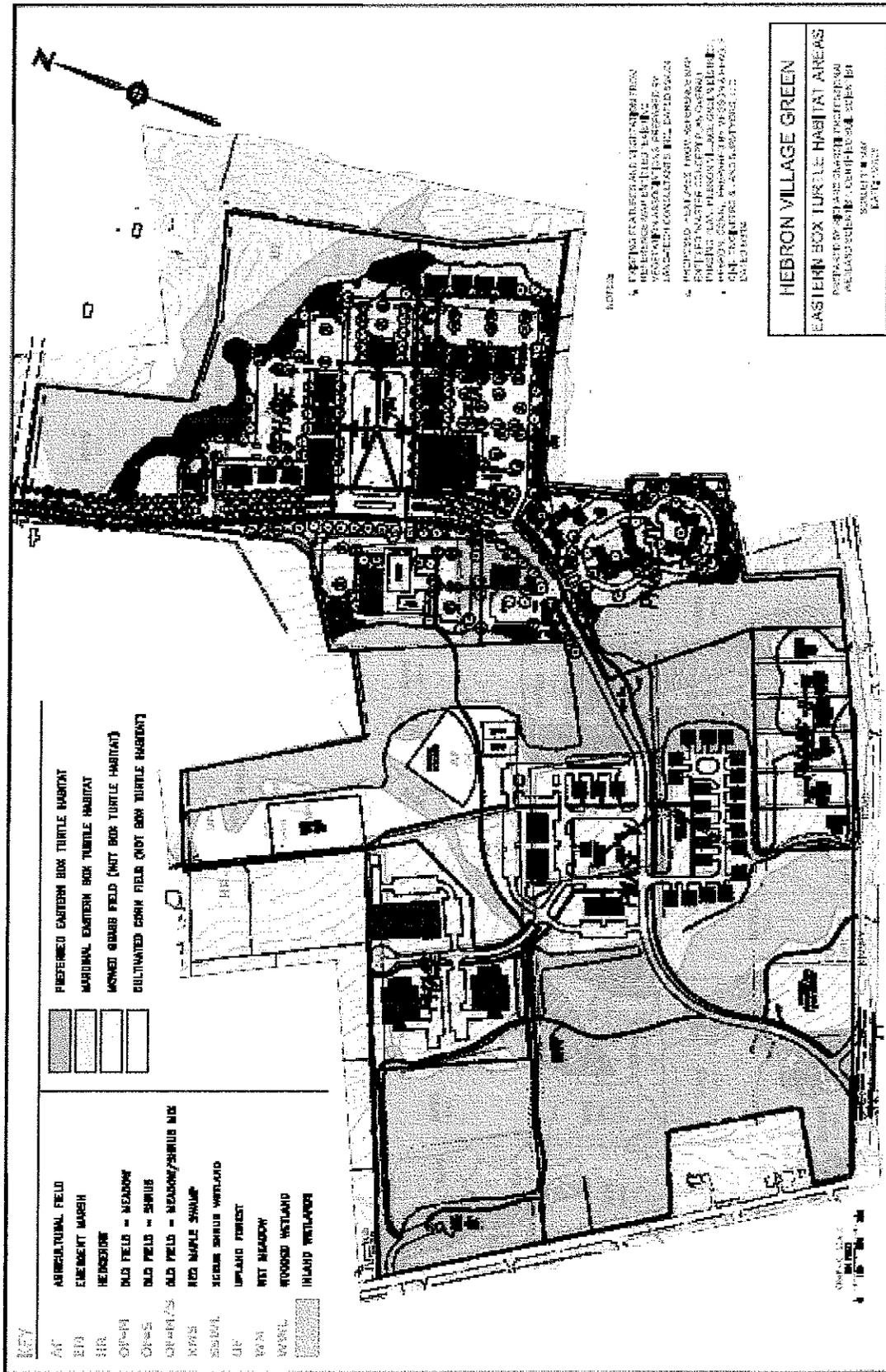


Figure 4-7: Eastern Box Turtle Habitat Areas with Development Overlay

4.13 Flood Hazard Potential

The following information regarding flood hazard potential has been obtained in part from the *Natural Resources Inventory and Impact Assessment, Hebron Village Green; Hebron, Connecticut* (8/24/2004).

4.13.1 Existing Environment

The Hebron Village District project site is located within the upper watershed area of the 8.7 square mile Raymond Brook drainage basin, which is part of the Salmon Regional Basin. Raymond Brook is a second order tributary to the Jeremy River.

The DEP reports that the proposed project is not within the 100-year flood zone on the community's Flood Insurance Rate Map as shown in Figure 4-8. However, localized flooding could occur if no preventative measures were taken.

4.13.2 Analysis of Impact

Inland wetlands help reduce the effects of flooding by slowing the flow of surface water runoff and temporarily storing floodwaters within the wetland basin. The stormwater controls proposed will mitigate peak runoff rates after development as to not exceed existing rates. Floodwaters are released slowly from these wetlands, thus reducing flow rates and minimizing impacts to downstream areas. The three main wetland corridors provide some flood storage and stormwater retention. Flooding of the riparian zone especially along the stream on the west side of the property provides for removal of suspended solids (pollutants) by direct settlement and adsorption.

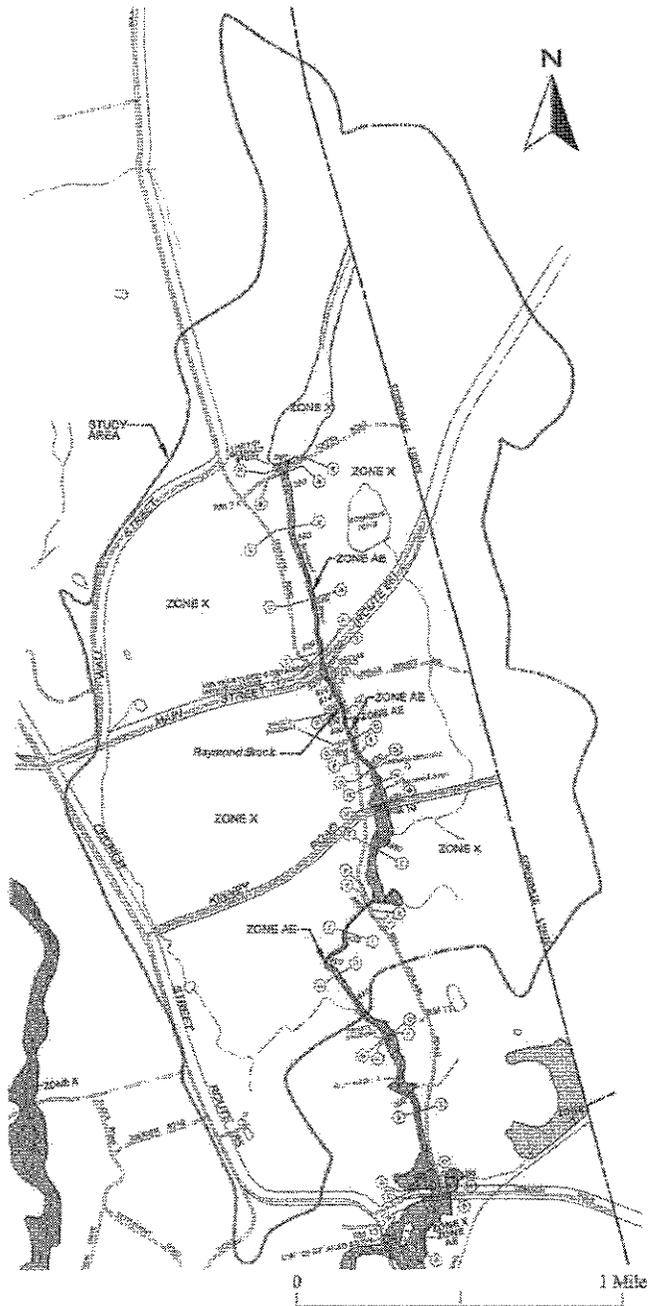


Figure 4-8: Special Flood Hazard Areas
Source: Town of Hebron Flood Insurance Study - 1991

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4.14 Pesticides, Solid Waste, Recyclables, and Hazardous Waste

The following information regarding pesticides, toxic or hazardous materials, and solid waste has been obtained in part from the *Town of Hebron Plan of Conservation and Development* (1/2004) and the *Natural Resources Inventory and Impact Assessment, Hebron Village Green; Hebron, Connecticut* (8/24/2004).

4.14.1 Existing Environment

The DEP recommends following recent state and federal legislation to encourage prevention of pollution. The Waste Planning & Standards Division's guidelines for pollution prevention should be considered by the project sponsor to prevent pollution. Town studies also address requirements to mitigate the potential for contamination from the storage and potential release of hazardous materials.

The solid waste disposal facilities for the town are located at the public works complex. These facilities include two attendant stations, the compactor and its wooden shell, and ten roll-off containers, which collect recyclables, household trash, bulky waste, metal, brush, leaves and grass clippings. All Municipal Solid Waste is transported to the Connecticut Resource Recovery Authority's (CRRA) incinerator while recyclables are delivered to CRRA's recycling center. Brush and other vegetation are accepted by Earthgrow, a permitted compost facility. An on-site compost area is not practical. Recyclables include newspapers/magazines, cardboard, metal food containers, glass and certain plastics. Hazardous waste is collected bi-annually through a regional effort at the Olcott Street disposal facility in Manchester. Bulky waste is currently brought to the Manchester landfill, while bulk metal is recycled. The transfer station does collect and recycle waste oil, anti-freeze, batteries and tires and occasionally collects expired phone books. Dried latex paint is accepted and is disposed of in the household trash compactor.

The town disposes of 194 tons of solid waste and 55 tons of bulky waste per month. Nine tons per month of plant materials are removed while 57 tons of recyclables are removed. Currently, there is a resident fee to dispose of bulky waste and brush, but there is no fee otherwise charged. However, the Town is currently contemplating a nominal transfer station permit fee. Private waste disposal contractors also serve the town.

Equipment required for solid waste disposal includes a roll-off truck, a backhoe, a compactor and fifteen roll-off bins. While the physical condition of the transfer station is adequate, the facility is considered overcrowded and inadequate in terms of space for the future. A new roll-off truck and compactor will be needed in the near future.

4.14.2 Analysis of Impact

Extensive uses of pesticides are not expected to be used in the Village Green District, at this time. If pesticides are used, proper precautions will be provided and utilized.

The current solid waste disposal facilities for solid waste and recyclables should be capable of handling the additional solid waste created by the project

In that the proposed commercial uses of the Village Green District are generally limited to business and light industrial, there would be no foreseeable uses which would generate significant hazardous waste material. As with any development there is some potential for groundwater and surface water contamination from the storage and potential release of hazardous materials from standard uses such as oil/fuel storage and turf management. In order to mitigate the potential for contamination, the following guidelines will be applied to the site:

- Fuel or chemical storage tanks will be above ground within well recharge areas and will be provided with secondary containment.
- Underground fuel or chemical storage tanks, outside of well recharge areas, will have double wall construction.
- There will be no outdoor storage of hazardous materials. Potentially hazardous materials sold at retail stores, such as lawn and garden care products will be stored indoors or within a roofed structure away from floor drains. Loading and handling areas will be covered and have spill containment devices.
- Industrial or retail facilities that store, use, or generate hazardous materials will have specific hazardous material management plans addressing inventory, storage, handling, disposal, and emergency response.
- Turf management in public areas including recreational fields and greens will emphasize an integrated pest management approach that minimizes the use of chemical pesticides, herbicides and fertilizers.

4.15 Traffic and Roadway Network

The following information regarding the traffic and roadway network has been obtained in part from the *Traffic Impact Report, Village Green District, Hebron, Connecticut* (8/24/2004) and the *Master Concept Plan (MCP) & Development Standards (DS), Hebron Village Green District, Property of Horton Brothers, LLC* (12/2004).

4.15.1 Description of Area

The proposed project will occur on the south side of Main Street (Route 66), the east side of Church Street (Route 85), and the north side of Kinney Road in Hebron. Figure 4-9 shows the Village Green District in comparison to the surrounding roadways

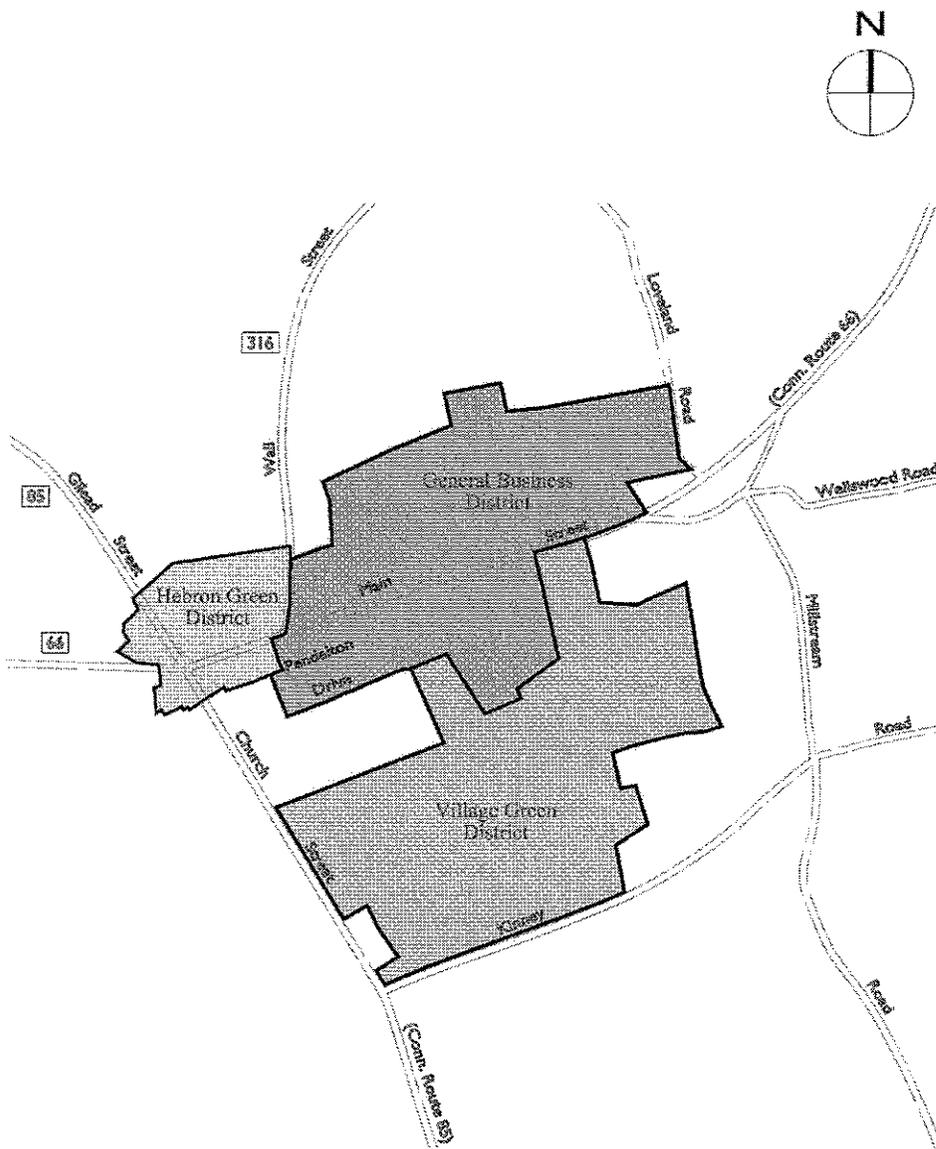


Figure 4-9: Hebron, CT Road Map

Route 85 is a state maintained highway that originates at Route 44 in Bolton and extends southerly through Hebron to New London. In the vicinity of the site Route 85 provides twelve foot wide travel lanes and shoulders of varying widths. Land uses in the area are predominately residential and the Hebron Elementary School is located between Route 66 and Kinney Road. The speed limit along Route 85 is posted at 45 miles per hour (mph) in some areas and 50 mph in others. The school zones are posted at 30 mph and the approaches to Route 66 at 35 mph.

Route 66 is a state maintained highway running generally in a northwesterly direction through several town centers from Interstate 691 in Meriden to Route 32 in Willimantic, with access to Interstate 91, Route 9, Route 2, and Route 6. In the area of the site Route 66 is also known as Main Street, and it provides approximately thirty-eight feet of pavement with a single thirteen to fifteen foot lane and a wide shoulder in each direction of travel. Additional turning lanes are provided as necessary. Signals are provided at the intersections with Route 85 and Route 316 in Hebron and further east at Route 87 in Columbia. The speed limit is posted at 35 mph throughout the center of town and 45 mph west of Route 85 and east of the IGA commercial plaza. Land uses in the area include commercial, retail, financial and other service businesses, residential uses, the town green and a church. Continuing east toward Route 87, land uses include single-family homes, farms, and a hunting range. Passing is permitted along some portions of Route 66 outside of the town centers.

Kinney Road is a town road approximately nineteen feet wide with a single yellow centerline. The approach to Route 85 operates under stop sign control. It provides access for the single-family homes in the vicinity and the speed limit is posted at 25 mph.

Route 316 is a state maintained highway that originates at Route 66 and extends northerly to its terminus at Route 6 in Andover. Uses in the area along Route 316 include the local schools, the Veteran's Memorial Park, single-family homes, and some commercial uses located in the vicinity of Route 66.

Route 87 is a state maintained highway that originates at Route 2 in Norwich and extends northerly to Route 6 in Andover. At the intersection with Route 66 there is a church, automobile repair shop, small office building, and the town center green for Columbia. Land uses on Route 87 further from the intersection are predominately single-family homes and farms, as well as a school slightly north of Route 66.

Route 207 is a state maintained two-lane highway oriented in a generally east/west direction from Route 85 in Lebanon to Route 97 just west of the Willimantic River in Sprague. In the vicinity of Route 85 the predominant land use is single-family homes.

4.15.2 Background Traffic

Background traffic is defined as the traffic on the existing roadway network that would exist at the time of the proposed facility's opening even if the development did not take place. Since the development is proposed for staged construction, a design year of 2010

was analyzed. The design year is the year in which it is anticipated that the facility will be fully constructed and operating normally. The anticipated traffic patterns for the design year are based on the existing traffic patterns.

The State of Connecticut Department of Transportation (ConnDOT) maintains a system of automated traffic counters on state highways and certain other roadways. The ConnDOT counts of the Average Daily Traffic volume (ADT) conducted during July 1999 were collected for the surrounding Routes during a.m. and p.m. peak hours. In order to verify and update the ConnDOT data, F.A. Hesketh & Associates, Inc. placed automated traffic counters on several local roadways for a period of one week in late November and early December of 2002. In addition to the automated traffic counts, manual turning movement counts were conducted at several intersections in the vicinity of the site.

All of these counts were utilized to develop volumes for the existing 2004 traffic pattern. A review of the past traffic volumes indicates that the average annual growth rate on Route 66 is under 1% and under 2% on Route 85. In addition, it is a rural area with a history of limited growth patterns and no anticipated large developments except for the proposed project. An annual growth rate of 1.5%, for a total of 3%, was applied to the through volumes in front of the site on Routes 66 and 85. The resulting is the 2004 Existing Traffic volumes during the a.m., p.m., and Saturday peak hours.

The 2010 design year for the study designates the need to grow the traffic volumes from their existing 2004 approximate levels. The site generated traffic for two approved and partially constructed developments known as Loveland Hills Phase I and Phase II was also added to the existing traffic volumes. The resulting 2010 Background Traffic volumes for individual intersection turning movements during the a.m., p.m., and Saturday peak hours were recorded.

4.15.3 Site Description

Vehicle access to the site is proposed by way of two new access points, one approaching Route 66 and the other approaching Route 85. The Route 66 access road will provide a minimum of twenty-four feet of pavement for each direction separated by a raised landscaped median. Further into the site the median will be wider and landscaped while the twenty-four feet of pavement on either side will remain, providing by-pass capability around left turning traffic in the heavier use retail/office areas. As the roadway continues west through the site to areas of lesser use the median is discontinued and the pavement width narrows, encouraging slower vehicle speeds. At the centrally located park and clubhouse, a roadway extending north through the site will provide access to industrial areas and parking for the proposed athletic fields.

The Route 85 access will be at the location of the existing Kinney Road intersection. Kinney Road will be reconfigured and relocated to approach the proposed site access roadway east of Route 85. It is proposed to maintain the single lane of approach to Route 85. The intersection is proposed to operate under signalized control. A third access on

Route 85 currently providing access to a small existing ten-vehicle parking lot with direct access only to hiking trails will remain. Due to the small size of the lot and limited access to facilities, this access was not considered in the distribution of site traffic. The two signalized access roads, one on Route 66 and one on Route 85, will be shown to provide adequate access and appropriate geometry for safe operations.

Parking on the site will be provided so that each land use has adequate parking easily accessible to the building or recreational area. Some of the buildings are located with access to larger shared parking areas. In addition, the roadway directly north and south of the market square will be provided with up to forty feet of pavement, sufficient for on-street parking.

4.15.4 Site Generated Traffic

Estimating the amount of traffic attributed to a new land use involves studying the amount of traffic that has been recorded at similar land uses that were constructed in the past and that have operated for a sufficient period of time to have a stabilized and developed a consistent pattern. In 1976, the Institute of Transportation Engineers (ITE) published a compilation of studies gathered from traffic engineers, planners, and public officials throughout the country at various land uses. That document, entitled *Trip Generation* was updated several times, most recently a seventh edition in 2003, and provides traffic engineers and planning officials with a single document and guide on more than 4,250 individual trip generation rates for many land uses and building types.

For this project *Trip Generation* was utilized for each of the individual land uses. The traffic generated by the individual uses was computed and the totals added together. The site generated volumes were applied to the roadway network following the distribution pattern, resulting in the volumes calculated for the Site Generated Traffic during the a.m., p.m., and Saturday peak hours. This traffic was then added to the appropriate peak hour 2010 Background Traffic in order to determine the 2010 Combined Traffic volumes for the a.m., p.m., and Saturday peak hours.

4.15.5 Traffic Impact

In order to determine the traffic impact of the proposed development, capacity analyses were conducted for the 2010 background and combined traffic volume conditions as well as the combined traffic volumes with the proposed improvements. The analyses utilized techniques presented in the "2000 Highway Capacity Manual" (HCM) (Special Report No. 209), published by the Transportation Research Board. These analyses were conducted to determine the operational effectiveness of each of the intersections studied.

For signalized intersections, the total capacity of the intersection is computed on a movement-by-movement basis. This represents the maximum number of vehicles that can utilize the intersection during an hour. A comparison with the total number of vehicles attempting to use the intersection yields the volume-to-capacity ratio (v/c), which is equivalent to the percentage of capacity utilized during the peak hour. As the v/c

ratio approaches 1, the intersection nears capacity. A v/c ratio greater than 1 indicates that some cars are unable to proceed through the intersection and will be stored on an approach.

In addition, the Level of Service (LOS) is determined for each of the intersections. LOS is a measure of the delay time experienced by stopped vehicles at the intersection. The Level of Service for minor street stop controlled intersections is somewhat different from the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. LOS is computed for the stopped approaches and for the main street left turns only. Through traffic is considered to have a minimal delay. The LOS is rated on a scale from A to F for both the signalized and unsignalized intersections, which is shown in Table 4-10.

Table 4-10: Level of Service Criteria

Level of Service (LOS)	Signalized Average Total Delay (sec/vehicle)	Unsignalized Average Total Delay (sec/vehicle)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Level of Service analysis was performed for six existing study intersections for the a.m., p.m., and Saturday peak hours. Table 4-11 to Table 4-13 present existing and future projected levels of service in the vicinity of the Village Green District as determined by the F.A. Hesketh & Associates, Inc. analysis. Projections are given with and without mitigation. As indicated, with mitigation, all intersections in this vicinity are projected to operate at LOS C or better. An asterisk (*) indicates a signalized intersection.

Table 4-11: A.M. Level of Service Analysis at Selected Intersections

Intersection	Background LOS	2010 LOS (w/o mitigation)	2010 LOS (w/ mitigation)
Route 66 at Route 85	C*	D*	B*
Route 66 at Route 316	A*	B*	B*
Route 66 at the Site Drive	C	F	B*
Route 66 at Route 87	C*	C*	C*
Route 85 at Kinney Road			
Westbound approach	C	D	A*
Southbound left turn	A	A	A*
Route 85 at Route 207			
Southbound left turn	A	A	A
Westbound Leg	B	C	C

Table 4-12: P.M. Level of Service Analysis at Selected Intersections

Intersection		Background LOS	2010 LOS (w/o mitigation)	2010 LOS (w/ mitigation)
Route 66 at Route 85		E*	E*	C*
Route 66 at Route 316		B*	F*	B*
Route 66 at the Site Drive		C/F	F	C*
Route 66 at Route 87		B*	B*	B*
Route 85 at Kinney Road				
	Westbound approach	C	F	B*
	Southbound left turn	A	A	B*
Route 85 at Route 207				
	Southbound left turn	A	A	A
	Westbound Leg	C	C	C

Table 4-13: Saturday Level of Service Analysis at Selected Intersections

Intersection		Background LOS	2010 LOS (w/o mitigation)	2010 LOS (w/ mitigation)
Route 66 at Route 85		C*	F*	B*
Route 66 at Route 316		B*	C*	B*
Route 66 at the Site Drive		B/F	F	B*
Route 66 at Route 87		B*	B*	B*
Route 85 at Kinney Road				
	Westbound approach	C	F	A*
	Southbound left turn	A	A	A*
Route 85 at Route 207				
	Southbound left turn	A	A	A
	Westbound Leg	B	C	C

The following lists the current intersections characteristics and the proposed improvements which will occur at each of the studied intersections:

Route 66 at Route 85

This is an existing signalized four-way intersection with Route 66 oriented in the east/west direction with Route 85 oriented in the north/south direction. The intersection provides two lanes on each of four approaches consisting of an exclusive left turn lane and a shared through/right turn lane.

In order to provide for the orderly flow of traffic, improvements are proposed to provide an additional eastbound through lane and an additional westbound through lane. Widening is proposed on the northbound approach to provide an exclusive left turn lane, a single through lane, and a dedicated right turn lane. The southbound approach will remain in its current configuration.

Route 66 at Route 316

This is an existing signalized intersection with Route 66 oriented in the east/west direction with Route 316 approaching from the north. A minor commercial driveway approaches from the south opposite Route 316. The Route 66 approaches are striped for a single fifteen foot wide lane with a five foot shoulder on the eastbound approach and a six foot shoulder on the westbound approach. Route 316 provides a single lane approach as does the commercial driveway.

In order to offset the impact of the site generated traffic, it is proposed to widen and re-stripe Route 66 to provide two shared lanes on each approach.

Route 66 at the Commercial Plaza and Site Drive

This is an existing unsignalized "T" intersection with Route 66 oriented in the east/west direction and the IGA Shopping Plaza driveway approaching from the north. The Route 66 eastbound approach provides a single through lane and a dedicated left turn lane. The westbound approach is a single lane approach. The IGA driveway provides separate lanes for left and right turning vehicles and operated under stop sign control.

Due to the poor LOS a signal warrant analysis was performed for the intersection to see if a traffic signal was warranted at this location and found that a signal was warranted. In order to provide for an orderly flow of traffic Route 66 will be widened to provide an exclusive westbound left turn lane and a shared through/right turn lane. The eastbound approach will be widened to provide a dedicated left turn lane, a single through lane, and a dedicated right turn lane.

Route 66 at Route 87

This is an existing signalized intersection with Route 66 oriented in the east/west direction with Route 87 oriented in the north/south direction. Although the intersection is striped for all single lane approaches, the eastbound approach on Route 66 is approximately thirty feet wide and the westbound approach is eighteen feet wide providing bypass capability for turning vehicles on both approaches.

The addition of the site generated traffic does not have a significant impact on the operations or LOS at the intersection and thus no mitigations are required.

Route 85 at Kinney Road

This is an existing unsignalized "T" intersection with Route 85 oriented in a north/south direction with Kinney Road approaching from the east. All approaches to this intersection are single lane approaches with the westbound Kinney Road approach operating under stop sign control. The proposed site plans show that Kinney Road will be relocated and reoriented to intersect with the proposed site access roadway that will intersect with Route 85 at the same location as the existing Kinney Road intersection.

Due to the poor LOS a signal warrant analysis was performed for the intersection to see if a traffic signal was warranted at this location and found that a signal was warranted. In order to provide for an orderly flow of traffic, it is proposed to widen Route 85 to accommodate a southbound left turn lane.

Route 85 at Route 207

This is an existing unsignalized “T” intersection with Route 85 oriented in the north/south direction with Route 207 approaching from the west. Each approach provides a single lane.

When the site traffic is added to the intersection, the analysis shows no significant impact to require mitigation.

4.15.6 Signal Warrant Analysis

Due to poor levels of service and high delay for turning movements at certain intersections, a signal warrant analysis was performed to determine whether traffic conditions would justify the installation of a traffic signal at each of these intersections. These include the intersections of Route 66 with the IGA driveway and the proposed site access roadway as well as Route 85 with the proposed site access roadway. Four of the warrants listed in the Manual on Uniform Traffic Control Devices (MUTCD) are applicable to conditions at these intersections:

- 1 The “minimum vehicular volume” warrant, which is applied where the volume of intersecting traffic is the principal reason for consideration of installation;
2. The “interruption of continuous traffic” warrant, which applies to operating conditions where the traffic volume on the major street is so heavy that traffic on the minor street suffers excessive delay or hazard in crossing the major street;
- 3 The “four hour volumes” warrant, which is intended for application when traffic conditions are such that, during peak travel periods, the minor street traffic suffers undue delay in entering or crossing the major street; and
4. The “peak hour volume” warrant, which applies during a single hour, the minor street traffic suffers excessive delay.

The first two warrants are satisfied when, for each of any eight hours of an average day, the minimum traffic volumes specified in the MUTCD are met or exceeded. These minimum volumes apply to the major street (total of both approaches) and to the minor street approach to the intersection. The minimum volumes are a function of the number of lanes on each approach, the 85-percentile speed of the main road, and the population of the surrounding area. The latter two warrants are satisfied when the plotted points representing the hourly volume on the major street (total of both approaches) and the corresponding hourly volume on the highest minor street approach lie above the curves shown in the graphs provided in the MUTCD.

In order to do the warrant analyses, the anticipated hourly traffic was determined for each of the intersections. These were based on existing hourly counts and the proposed site traffic distributed throughout the day. The four warrant analyses were conducted for each intersection.

The intersection of Route 66 with the proposed site access road opposite an existing commercial plaza driveway was analyzed. The results indicate that all four warrants are met and the developer proposes to install a signal at this location. In addition, the developer will widen Route 66 in order to provide sufficient pavement width for exclusive turning lanes into the site.

The second site access, located on Route 85 at Kinney Road, was also analyzed. The results indicate that the peak hour warrant, the minimum vehicular volume warrant, and the interruption of continuous traffic warrant are met when utilizing the rural warrant volumes. Due to the low levels of service and the very high delays experienced by the site traffic at this intersection, as well as the results of the warrant analyses, it is recommended that this intersection be signalized by the developer.

4.15.7 Phase I of Traffic Improvements

Much like the Village Green project itself, the traffic improvements will be implemented in phases. Phase I is analyzed in a letter from Scott F. Hesketh, P.E., of F.A. Hesketh & Associates, Inc. dated December 14, 2004.

Site analysis included the intersection of Route 66 with the existing IGA Plaza driveway and the proposed site access roadway. For the purpose of the analysis they assumed that the intersection will be improved to provide exclusive left turn lanes for the eastbound and westbound approaches of Route 66. The site access roadway is proposed to provide a two lane approach. The intersection was assumed to operate under signalized control. Based on these assumptions the intersection will operate at a LOS A during the a.m. peak hour, a LOS C during the p.m. peak hour and a LOS B during the Saturday peak hour.

The capacity of a two lane roadway with a 70/30 directional split is approximately 2,500 passenger cars per hour under ideal conditions. The Phase I development is projected to generate a maximum of 476 trips an hour. This volume represents approximately 20% of the roadway capacity. This analysis however, is not strictly applicable. In order to confirm this, an analysis was conducted for a hypothetical site driveway that intersects the site access roadway immediately south of Route 66. The level of service for all movements at that driveway was determined to be LOS B or better during peak hours. Since the unsignalized driveway operates at LOS B or better it is reasonable to assume that the roadway provides sufficient capacity to accommodate the same traffic volumes.

Based on this analysis, it is the opinion of F.A. Hesketh & Associates, Inc. that the proposed interim roadway improvements are capable of accommodating the anticipated Phase I traffic volumes, provided that the site access roadway is configured to provide

exclusive left turn lanes for the eastbound and westbound approaches and that the intersection operate under signalized control.

4.15.8 Sight Line Analysis

The Connecticut Department of Transportation has published its requirements for the application of sight distances at intersections and driveways as adopted in December of 2003. In general, the intersection sight distance (ISD) is the available sight distance allowing a driver approaching an intersection to observe the vehicles on the crossing roadway or opposing direction. Basically, the ISD should be sufficiently long for a driver in a fully stopped vehicle at an intersection to complete a turning or crossing maneuver. Therefore, the ISD varies according to the speed of traffic and distance crossed while performing the maneuver. The clear line of sight is measured from a minimum of fifteen feet behind the edge of the road or traveled way to a point within the road, while the ISD is the line of sight projected along the length of the roadway. The line should be measured at a height of three feet six inches from the beginning point (driver's eye level) to the end point (object in roadway).

Observations at the intersection of Route 66 and the proposed site access roadway indicate that available sight to the east exceeds the current ConnDOT requirement for a design speed of 50 mph. The available sight distance to the west meets the ConnDOT requirement for a design speed of 35 mph. It may be necessary to trim back existing tree branches and shrubs that extend into the right-of-way on the south side of Route 66 nearly to the pavement in order to maintain this sight distance in the future. The posted speed limit for Route 66 is 35 mph. The existing sight distances for the opposing driveway for the east and west both exceed the requirements for a design speed of 70 mph.

The sight distances along Route 85 at Kinney Road were observed to meet ConnDOT's requirement for a design speed of 35 mph. This is a school zone area with posted speed limit of 30 mph. The sight distance to the left on Route 85 was observed to exceed requirements for a design speed of 70 mph.

4.15.9 Traffic Accident Data

The Connecticut Department of Transportation gathers and compiles traffic accident data for all state highways and some major local roadways. A list of accidents occurring in the area from January 1st, 1999 through December 31st, 2001 includes the most recent three years of available data. Injuries are reported on a scale of A to C, with A injuries necessitating assistance and C injuries listing complaints. Fatalities are indicated separately. A three year accident history was compiled for each highway within 500 feet of the intersections analyzed in this study. In addition ConnDOT maintains a Traffic Accident Surveillance Report (TASR), a list that rates sections of roadway on accident occurrence. The methodology used essentially compares the actual recorded accident rate at an intersection to a calculated critical accident rate based on intersection type and quality control. This accident ratio reaches the critical point when those two numbers are

equal and the ratio is equal to or greater than 1.0. Also included in that list is a notation for intersections that are on the state's Suggested List of Surveillance Study Sites, or SLOSS. The most recent available TASR list is based on data collected from 1998 to 2000.

The area encompassing the intersections of Route 66 with Route 85 and Route 316 contained a total of thirty-nine accidents during the time period reviewed. Although approximately 44% of those were rear-end collisions, many of the accidents involved vehicles turning or slowing to turn left at one of the two intersections. The TASR indicates that the accident ratios for Route 66 and Route 85 are 1.11 and 0.78, while the ratios for Route 66 and Route 316 are 0.16 and 0.71. Neither intersection is on the SLOSS. Previous discussion of the capacity of these intersections indicated that roadway widening to provide additional lanes would lessen delay times and increase the levels of service provided. The inclusion of exclusive turning lanes or shared lanes also would allow the safe storage of vehicle queued for certain movements while permitting other traffic to move around them. This is likely to reduce both the number of rear-end accidents occurring due to vehicles stopped for a turning maneuver as well as the number of turning accidents due to insufficient capacity.

The history of accidents for Route 66 in the vicinity of the proposed site driveway is limited to a single incident each year over the three year study period. All three involve one vehicle turning into or out of a driveway into the path of a vehicle going straight on Route 66. The future traffic signal at the site driveway will aid in reducing the possible occurrence of accidents due to the number of anticipated turning movements at the site. The installation of the signal is also likely to reduce the occurrence of similar accidents at unsignalized intersections nearby because the signal will tend to platoon traffic thus providing longer gaps between the platoons for turning maneuvers.

During the three years covered in the study, six accidents occurred on Route 85 near Kinney Road. On November 15th, 2000, a fatal accident occurred when a vehicle hit a pedestrian crossing the road in the dark approximately 300 feet north of the intersection in the school zone. The remaining five accidents were speeding vehicles skidding on wet, slushy, or oil slicked pavement. Two of the incidents happened within fifteen minutes of each other on December 20th, 2000, in snowy conditions. The intersection is listed in the TASR as having a low accident ratio of 0.23. There are no specific measures to be taken as a result of the major accident; however, the signalization of the intersection allows the possibility to provide a pedestrian crossing phase to encourage crossing at the intersection.

To better facilitate safe pedestrian crossings in this area, the Master Concept Plan proposes putting into place traffic calming measures to be incorporated into the road design of the main connector road from Route 66 to Route 85. These include utilizing concrete pavers at pedestrian crossings and bands of cobblestone across traveled way before pedestrian crossings and at market square and Neighborhood Park intersections. In addition, the plan suggests maintaining open areas or changes in landscaping to signal approaches to intersections.

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4.16 Public Utilities and Services

The following information regarding public utilities and services has been obtained in part from the *Department of Economic and Community Development Infrastructure and Real Estate Projects; Environmental Assessment; Project ID No. #306 (3/2004)* and *Natural Resources Inventory and Impact Assessment; Hebron Village Green; Hebron, Connecticut (8/24/2004)* and *Property of Horton Brothers, LLC, Hebron Connecticut; Village Green District; Public Works Impact Statement; Stormwater Systems, Lighting, Parking, Wastewater (8/2004)*. The utility systems in the Village Green District include both public and private utilities.

4.16.1 Water Supply

Water supply for the Village Green District will be provided by Birmingham Utilities, a CT company which acquired ownership of the previous provider Aqua Source in late 2003. Birmingham Utilities currently operates the Hebron Center Water System. The existing facilities within this water supply system include an existing twelve acre well field located on the property of Loveland Hills, LLC on the west side of Loveland Road. The existing facilities include three existing wells ranging in depth from 100 to 500 feet, with a combined 18-hour safe yield of 78,540 gallons per day (GPD); a pump station; and storage tank with a storage capacity of almost 180,000 gallons.

The existing system has sufficient capacity to meet any foreseeable peak demand and should meet the needs of the community for many years to come. A Diversion Permit from the CT DEP will, however, be required for daily well production of these wells to exceed 50,000 GPD. Although not yet approaching this limit, Birmingham Utilities has indicated that they have already begun to discuss the application requirements with the DEP in anticipation of increased demand.

4.16.2 Analysis of Water Supply Impacts

Because this site will be serviced by a public water supply system, the main concern with regard to water supply is to ensure Birmingham Utilities has the capacity to accept the average daily and peak flow generated by the project.

According to a letter from Birmingham Utilities, Inc. dated December 2, 2004, they have asked the developer to retain "well field" easements across any open space parcels so that Birmingham will have the ability to develop additional wells to support this and any other developments in the area. Well field easements have been shown on the applicant's Master Concept Plan. Project demand, including the proposed Village Green District is expected to be within the existing available capacity. While the projected sewage flow is estimate to be 66,700 GPD, this estimate is based on conservative assumptions. As such it is anticipated that the actual usage will be well below this amount. Since the project will be completed over six to ten years there are no foreseeable problems providing an ample supply of water for any contemplated use.

According to a letter from Birmingham Utilities, Inc. dated February 12, 2004, their current commitments to existing customers and projects in the construction and approval process will require less than half of the existing water supply capacity. Sufficient capacity remains to serve as much as an additional 100,000 square feet of commercial space along with another 50-100 residential units. The letter goes on to discuss two ways how the future water needs of the Town's business district can be addressed. First, when the existing twelve acres set aside for the well fields are fully-developed, it should be possible to achieve a 50 to 100% increase in system capacity. Second, a review of land use and wetland maps for the center of Hebron indicate a number of likely locations for secondary well fields adjacent to areas already identified as suitable for development.

Any new source of public drinking water to supply this area will have to be approved by the Drinking Water Division (DWD) of the Department of Public Health. If on-site sources were developed to supplement existing water supplies, hydrogeologic investigations would be required to assess water availability and potential impacts on existing water supplies and natural resources. The DEP DWD and Birmingham Utilities, Inc. both have identified the need to prioritize water quality protection in the project area, as well as existing well fields, which is consistent with the Town's provided well.

4.16.3 Sanitary Sewer

The proposed Village Green development will utilize available public sewers. DEP reports that sewer service is available at the site along both Route 66 and 85. Flows are conveyed to the East Hampton water pollution control facility, which has a design capacity of 3.9 million gallons per day (MGD). In 2000, flows averaged 1.2 MGD. Projected flows from the project site were factored into the design of the sewer system and included in the existing inter-municipal agreement. In 2000 (per ERT report), the Town's sewer allocation with Colchester is approximately 210,000 GPD, with approximately 100,000 GPD currently used. DEP further stated that an environmental review of the project should include updated sewage projections with respect to capacity. In addition, any industrial wastewater discharge to either groundwater, surface water, or the municipal sewer system will require permitting and pretreatment, as appropriate, and, if directed to the municipal sewer system, must be compatible with the biological treatment processes at the sewage treatment plant.

According to the *Natural Resources Inventory and Impact Assessment* (8/24/2004), a rough estimate of the sewage flow from the development site estimated in 2004 was 45,450 GPD from Section I, and 21,250 GPD from Section II, for a grand total of 66,700 GPD.

4.16.4 Analysis of Sanitary Sewer Impacts

Because this site will be serviced by a public sewer system, the main concern with regard to wastewater is to ensure the conveyance system and sewage treatment plant have the capacity to accept the average daily and peak flow generated by the project. At this time it is believed that the pipes as well as the treatment facility will be able to handle the

additional flow created by the Village Green District with one minor exception as noted below. The other potential impact is the release of hazardous materials into the stormwater treatment system.

Earth Tech reviewed the proposed sewage plan and highlighted two points in a November 24, 2004 fax. First, the proposed method of connection to the sewer system will not have an impact on the capacity of the downstream pumping stations. Second, there is an existing 113 foot section of 15 inch diameter pipe located in Route 85 near Old Colchester Road that has an uncharged capacity of 683 gpm. The current peak flow in this section of sewer is 659 gpm meaning that the pipe is just about at capacity for the existing flows. The addition of the Village Green flows will add an additional 232 gpm for a total flow of 891 gpm. This pipe section will then be under-capacity due to the additional flows from this development. This section of pipe will be replaced by whichever project causes the pipe to go over the 683 gpm capacity before the Village Green Project ties into the existing sewer.

4.16.5 Electric, Gas, Telephone, and Cable Service

Electrical provider is Connecticut Light & Power. There is no gas service in this area of town. Telephone provider is SBC Connecticut. Cable Provider is TCI Cable of Central CT.

4.16.6 Analysis of Electric, Gas, Telephone, and Cable Service Impacts

At this time it is expected that all of these utilities (electric, gas, telephone, and cable) have the capability to be extended into the Village Green District with no additional environmental impact.

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4.17 *Hazards to Human Health or Safety*

The following information regarding hazards to human health or safety has been obtained in part from the *Property of Horton Brothers, LLC, Hebron Connecticut; Village Green District, Public Works Impact Statement; Stormwater Systems, Lighting, Parking, Wastewater (8/2004)*.

During construction, the Town will determine if evidence of motor vehicle tracks through the project area could indicate any apparent unauthorized and potentially hazardous dumping. Currently, the property owner and Town Officials, after numerous site walks and visits, are unaware of any unauthorized dumping. If soil and/or groundwater contamination is discovered during the implementation of the project, the DEP Permitting, Enforcement and Remediation Division (PERD) will be notified in writing. Site investigation/assessment and remediation requirements in accord with the Connecticut Remediation Standard Regulations will be followed.

Although the project involves very few if any existing facilities that may require rehabilitation and/or demolition, any such activities will adhere to the Department of Public Health's requirements for lead-based paint and asbestos.

Lighting safety has been taken into account in the development of the project by avoiding too little lighting in areas needing security. Measures have also been taken to help reduce glare, which could blind drivers and impede ability to safely operate a vehicle.

Parking safety has been taken into account in the development of the project by avoiding conflicts between pedestrian and vehicular traffic, and adequate light in parking areas

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5.0 Impact Evaluation

5.1 Unavoidable Adverse Environmental Impacts

Although a goal of this project has been environmental impact avoidance, minimization, and mitigation, certain adverse impacts are unavoidable. They are as follows:

Construction Related Unavoidable Adverse Environmental Impacts

The project implementation will have a construction aspect, during which time both land disturbance and construction will take place. Measures will be taken to minimize potential environmental impacts and to shorten the necessary length of construction. Specifically, mitigation measures are proposed with respect to short-term air and noise quality as indicated in §4.8 and §4.9 of this document as well as erosion and sediment control mitigation measures as listed below in §5.3. Even so, a certain degree of additional truck and equipment use and access will be necessary during this time period and is unavoidable.

5.2 Irreversible and Irrecoverable Commitment of Resources

The implementation of the project will consume non-renewable resources during the construction and ongoing operation (i.e. construction supplies, fuel, etc). Since these resources cannot be reused, they are considered to be irreversibly and irretrievably committed. Similarly, disposal of demolition material at a landfill and/or solid waste disposal facility will take up capacity in such facilities that is irreversible and irretrievable. Finally, the irreversible and irretrievable expenditure of approximately \$500,000 provided by the STEAP grant is targeted to assist in the construction of a new road and utilities to access the Town's Village Green District.

5.3 Mitigation Opportunities

As discussed throughout this document, opportunities for mitigation of potential impacts exist, including: (1) the provision of peak stormwater runoff attenuation such that no net increase in peak runoff rates will occur; (2) implementation of post development water quality measures; (3) air and noise mitigation through controls on contractor practices and work protocols; and (4) sedimentation and erosion controls through the use of accepted practices. Mitigation during the construction phase of the project will include the following:

- erosion and sediment controls to reduce mobility of exposed soil particles;
- as necessary, use of water or wetting agents on exposed soil or gravel areas;
- periodic sweeping of construction sites and driveways;
- daily rinsing of truck tires and equipment leaving the construction site;
- maintenance for portable generators, on-site machinery, and vehicles;
- organization of construction phasing to reduce the length of time and land area over which soil is exposed in an effort to reduce erosion by wind and water; and

- limitation of construction practices to normal business hours on weekdays to control potential noise disturbance in the area of the proposed development.

5.4 *Certificates, Permits, Approvals*

Stormwater Construction General Permits

Section 402 of the Federal Water Pollution Control Act regulates discharge to water bodies and watercourses. EPA has delegated this jurisdiction to the Connecticut DEP. Stormwater discharges from construction sites where five or more acres are to be disturbed require a permit pursuant to 40 CFR 122.26. The DEP Bureau of Water Management has issued a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* (Issuance Date: October 1, 1997; Modified: December 20, 2000; Revised: October 1, 2002) under the authority of Section 22a-430b of the General Statutes. Registration describing the site and the construction activity must be submitted to the DEP at least 30 days prior to the initiation of construction activities. The NPDES Phase II Storm Water Program requires the General Permit whenever a project has over one acre of cumulative land disturbance and the project does not require local land use approval. A Stormwater Pollution Control Plan, including measures for erosion and sediment controls and post-construction stormwater management, must be prepared. A goal of 80% removal of total suspended solids from the stormwater discharge has been set by the DEP in designing and installing stormwater management measures. For all sites which disturb ten acres or more at one time, a copy of the Stormwater Pollution Control Plan must also be included with the Registration.

US Army Corps of Engineers Wetlands Permit

Permit No. GP-41 (Effective Date: May 15, 2001; Expiration Date: May 15, 2006), states the jurisdiction that the New England District of the U.S. Army Corps of Engineers has in regards to the coastal and inland waters and wetlands within the State of Connecticut and lands located within the exterior boundaries of an Indian Reservation. An individual permit will be required if there is greater than one acre inland waterway and/or wetland fill and secondary impacts.

CT DEP Flood Management Certification

Administered by the Bureau of Water Management's Inland Water Resources Division, this program requires Department approval of a certification, or an exemption from such approval, for all State actions in or affecting floodplains or natural or man-made storm drainage facilities. The certification insures that the proposed activity is consistent with state standards and criteria for preventing flood hazards to human life, health or property and with the provisions of the National Flood Insurance Program (NFIP) and municipal floodplain regulations; does not adversely affect fish populations or fish passage; and does not promote intensive use and development of flood prone areas. The program is under the authority of Sections 25-68b through 25-68h, inclusive of the Connecticut

General Statutes (CGS) and the regulations set forth in Sections 25-68h-1 through 25-68h-3 of the Regulations of Connecticut State Agencies (RCSA).

State Traffic Commission

The State Traffic Commission must provide Traffic Signal Permits, Speed Limit Certificates, Major Traffic Generator Certificates (for developments over 100,000 sq. ft), and any other permits as designated by the Connecticut Department of Transportation.

Water Pollution Control Authority

The Water Pollution Control Authority will review: sewer user accounts, new sewer connections (hook-up fees, connection fees, and procedures), sewer service areas, sewage treatment practices, and CT DEP required special permits.

State of Connecticut Department of Public Health

A permit from the Department of Public Health may be required for the expansion of the water system.

Local Inland Wetland Approval

The Town of Hebron's Conservation Commission/Inland Wetland Agency requires inland wetland approval, for activities within one-hundred feet of wetlands or watercourses.

Local Zoning Approval

The Town of Hebron's Zoning Regulations required approval of the Master Concept Plan which was granted January of 2004. Further zoning approval will be granted for individual site development plans within the development from the Town of Hebron's Planning and Zoning Commission.

Other Likely Permits/Approvals

Other State and Federal permits may be required.

5.5 *Project Costs and Benefits*

The following information regarding project costs and benefits has been obtained in part from the *Fiscal Impact Analysis; Horton Brothers, LLC; Village Green District, Hebron, Connecticut (8/23/2004)*.

Quantifiable costs and benefits are objective, usually with dollar values attached to them. Many of the costs and benefits associated with this project, however, will be non-quantifiable because of their subjective nature. Quantifiable costs include those

associated with the planning, design, and construction of the project. A \$500,000 STEAP grant has been obtained to assist in the construction of a new road and utilities to access the Town's Village Green District.

Non-quantifiable costs include the environmental impacts associated with the construction and use of the proposed project. During construction, the cost to human comfort created by the increase in noise levels will be minimized by the adherence to accepted noise specifications and standards. Environmental impacts associated with the project will be mitigated as discussed in §5.3.

A benefit of the project, while non-quantifiable, will be the creation of additional residential housing in Hebron. Another benefit of the project includes employment opportunities for construction personnel as well as those who seek employment at one of the many new facilities created by the Village Green District.

In addition, the Town's projected tax revenues generated from this project are estimated to be \$1,056,518 per year, which includes \$951,735 in real estate taxes and \$104,783 in personal property taxes. The Town's estimated expenses due to the Village Green District are expected to be \$535,783 per year. This includes \$328,614 for commercial expenses and \$207,169 for residential expenses. Included in the residential expenses are general government, public safety, civic and human services, planning and land use, public works, insurance and benefits, open space, capital projects, debt service, single family town expenses, and education. From this data, it can be concluded that the net annual impact to the Town of Hebron will be \$520,735 in additional revenue.