

1 **CHAPTER 6**
2 **CONSERVATION**
3 **DATA, INVENTORY, AND ANALYSIS**

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VI-1. INTRODUCTION

A. Purpose

The Conservation Element provides a framework for the conservation and protection of natural resources. A measurement of the success of this element is the degree to which the quality of life within the community is enhanced by the goals, objectives and policies enunciated by this element. Such measurement can be in terms of public health, safety, welfare or environmental concerns.

The cornerstone of the conservation element is its plan and policies relevant to providing a basis upon which local officials can evaluate the overall needs of the community as contrasted to the necessity for conserving natural resources. Thus there is a clear need to delineate that which is to be protected, and the means for so doing, without the pressure associated with a given or perceived need.

This conservation element identifies and analyzes the natural resources within the corporate limits of the City of Lake Helen from the perspective of providing a high degree of conservation and protection to its fragile environs. Goals, objectives and policies needed to implement and monitor such a plan are provided.

B. Environmental Setting

The City of Lake Helen is located on the eastern edge of the Deland Ridge where it meets the Talbot Terrace. Based on geological records the Deland Ridge appears to be an ancient marine terrace which formed when the ocean level was much higher than it is today. This once flat surface has been altered by erosion and the collapse of caverns (sinkholes) formed by the solvent action of water in the underlying limestone. The local relief of the Deland Ridge is greater than any other region in Volusia County.

The Talbot Terrace is a broad, nearly level, poorly drained area with numerous shallow depressions and poorly defined drainage flow paths. The surface drainage patterns are in an early stage of development with respect to geologic time.

The highest ground elevations are found in the southwestern section of the city where the elevation reaches 90 feet above mean sea level (based on NGVD.) This is contrasted to the northeastern part of the city where the elevation drops to near 40 feet above mean sea level.

Given the general topography discussed above it is easy to see the sensitive nature of the natural resources contained within the corporate limits as well as that of the adjacent land area

74 which contributes to endangerment of the environmental concerns of the city. It is this diverse
75 array of sensitive natural resources that are inventoried and analyzed herein and a plan for the
76 conservation and protection thereof provided.

77

78 C. Current Situation

79

80 The City of Lake Helen is located in southwestern Volusia County, Florida and is in close
81 proximity to the cities of Deland, Deltona, Cassadaga and Orange City (Map 6-1). The City
82 covers 4.6 square miles and is approximately 2,903 acres.

83

84 The city is located in what is considered the Middle St. Johns River Basin. The north half of the
85 city is in the Deep Creek Sub-Basin and the south side of the city is in the Lake Monroe Sub-
86 Basin.

87

88 In 2000, the Governing Board of the St. Johns River Water Management District proposed the
89 middle basin as a Surface Water Improvement and Management (SWIM) program to
90 coordinate individual project areas into a regional framework.

91 The District's partners in these efforts include the Florida Department of Environmental
92 Protection (DEP), the Florida Department of Transportation, the Florida Fish and Wildlife
93 Conservation Commission, the U.S. Army Corps of Engineers; Lake, Orange, Seminole and
94 Volusia counties; the cities of Altamonte Springs, Casselberry, DeBary, Deltona, Eatonville,
95 Edgewood, Lake Helen, Lake Mary, Longwood, Maitland, Orlando, Oviedo, Sanford, Winter Park
96 and Winter Springs; the Florida Audubon Society; Orange Audubon; Friends of the Wekiva;
97 Friends of Lake Jesup; and The Nature Conservancy.

98

99 Deep Creek is in portions of southern Volusia and northeastern Seminole counties, covering
100 almost 274 square miles. Deep Creek provides a connection to the St. Johns River for Lake
101 Ashby in Volusia County. Another major feature within the Deep Creek subbasin is Lake Harney,
102 which is actually a widened section of the St. Johns River, with the river flowing into and out of
103 Lake Harney. Lake Harney is a shallow lake, and is just one of the two lakes that form within the
104 St. Johns River and are located within the middle basin — the other is Lake Monroe located
105 further downstream.

106

107 Lake Monroe is about 9,400 acres in size and is a shallow, wide area of the St. Johns River in
108 central Florida. The Lake Monroe portion of the Middle St. Johns River Basin is heavily
109 developed and is in an area designated as having the highest potential for growth in Seminole
110 County. Significant development has impacted the wetlands and waterways of this basin over
111 the years, such as the Interstate 4 corridor and the development in the cities of Sanford, Lake
112 Mary, DeBary and Deltona.

113

114

115 The City of Lake Helen is a small, rural community of some 2616 residents located in western
116 portion of Volusia County (Map 6-1). The historical rate of population growth has been
117 relatively stable ; however, since 2000, the City has started to see a decline with the population
118 decreasing approximately 4.5% between the 2000 census and 2010 census. This decline in
119 population is projected to continue in the short term (2021) and long term planning range
120 (2035).

121
122 The city does not have a central wastewater collection, transmission and treatment facility.
123 With the exception of a mobile home park which has its own wastewater facility all residents
124 and businesses rely upon the use of septic tanks and drainfields. The problem associated with
125 wastewater is beyond the fiscal capability of the city

126 **VI-2. INVENTORY AND ANALYSIS**

127
128 Located within the corporate limits of the city are a diverse array of environmental systems that
129 offer varying degrees of benefits and constraints to man. The more significant of these are
130 inventoried and discussed below.

131 132 A. Surface Waters

133
134 There are numerous natural lakes within the city limits of Lake Helen. Three of these lakes are
135 larger than 10 acres: Lake Helen is the largest, being nearly 26 acres; Lake Harlan at 22 acres;
136 and Lake Macy at 18 acres. There are several other lakes which vary in size from 8 acres to
137 less than 1 acre. Most of the lakes are totally land locked and all are relatively shallow. The
138 lakes offer a priceless aesthetic value to the city.

139 140 B. Wetlands

141
142 There are approximately 360 acres of wetlands and lakes located in Lake Helen's corporate
143 limits (Map 6-2). These wetlands consist primarily of cypress, gum and ash tree sloughs that are
144 valuable areas for storm water storage and treatment and home to many mammals, birds and
145 reptiles. Wetlands are protected by local, regional, state and federal regulations because of
146 the numerous benefits they provide.

147 148 C. Flood Plains

149
150 Some areas in Lake Helen are susceptible to local flooding when excessive rainfall occurs. These
151 flood prone areas are adjacent to the landlocked lakes, the drainageway from 1-4 to Lake Macy
152 and the wetland area in the northeast part of the City. The FEMA Flood Prone Map identifies
153 the 100 year flood areas (Map 6-3)

154 155 D. Aquifers

156

157 There are two aquifer systems in the Lake Helen area: the surficial groundwater aquifer and
158 the larger Floridan aquifer. A clay layer from the Miocene or Pliocene age lies above the
159 Floridan aquifer and forms the confining bed that retards water movement between the two
160 aquifer systems.

161
162 The surficial groundwater aquifer is used primarily for lawn irrigation by private wells and for
163 various agricultural uses. It is possible that leachate from improperly installed and maintained
164 septic tanks could contaminate this aquifer but to date there is no known instance of this
165 happening.

166 The city draws its municipal drinking water supply from the Floridan aquifer. The city will
167 continue to rely almost exclusively on the Floridan aquifer for future water needs.

168

169 E. Aquifer Recharge Areas

170

171 Lake Helen is not located within a major recharge area in Volusia County (Map 6-4).

172

173 F. Soils

174

175 Soil provides a natural filter for surface water that percolates downward toward the water
176 table. This filtering process helps remove the pollutants before they can pollute groundwater.

177

178 Based on the NRCS "Soil Survey of Volusia County," there are 21 major soil groups within the
179 City limits. Table 6-1 lists the various soil groups within the City limits. To offer a better
180 understanding of each soils potentials and limitations, information for each soil group regarding
181 soil properties and interpretations have been taken from the SCS' "Volusia County Soils Survey
182 Supplement and Vegetative Analysis. The utilization of septic tanks was evaluated in the Soil
183 Survey, according to soil type. Soil types were classified as having severe, moderate, or slight
184 limitations on such uses. Map 6-8 shows the soil limitations on the use of septic tanks.

185

186 Certain soil groups may be used to determine wetlands. These areas are under the
187 jurisdictional control of the St. Johns River Water Management District (SJRWMD). The
188 SJRWMD's "Applicants' Handbook for the Management and Storage of Surface Waters" lists the
189 various soil types for Volusia County which may be used to identify wetlands. Of the twenty soil
190 types listed as wetland indicators, four are found within Lake Helen's corporate limits. The
191 areas containing these soils are shown on Map 6-8 as wetlands. In general, it can be said that
192 any activities in these areas may require a permit from the St. Johns River Water Management
193 District and approval by the City of Lake Helen prior to any development.

194

195

196

TABLE 6-1
SOIL TYPES FOUND WITHIN THE CITY OF LAKE HELEN

197

198 APOPKA

199 ASTATULA

- 200 CASSIA
- 201 DAYTONA
- 202 DELAND
- 203 IMMOKALEE
- 204 IMMOKALEE, depressional
- 205 MYAKKA
- 206 MYAKKA/ST JOHNS
- 207 ORSINO
- 208 PAOLA
- 209 PLACID
- 210 QUARIZ, psarments
- 211 SAMSULA
- 212 SMYRNA
- 213 ST JOHNS
- 214 STLUCIE
- 215 TAVARES

216

217 Source: "Soil Survey of Volusia County," NRCS

218 **G. Areas of Soil Erosion Problems**

219

220 There are no major areas suffering soil erosion problems such as those experienced along the

221 beaches of many coastal communities. However, some erosion does occur with each rainfall in

222 the developed and agricultural areas. As the stormwater runoff travels over the ground it picks

223 up sediment and deposits it into the lakes.

224

225 **Commercially Valuable Minerals**

226

227 There are no known commercially valuable mineral deposits located within the City of Lake

228 Helen.

229

230 **H. Springs**

231

232 There are no known springs within the City of Lake Helen. Springs are often classified by the

233 volume of water they discharge. The largest springs are called first magnitude, defined as

234 springs that discharge water at a rate of 100 cubic feet of water per second. Second

235 magnitude springs are defined as springs that discharge water at a rate of 10 – 100 cubic

236 feet of water per second.

237

238 Due to the importance of spring protection, should any springs be identified in the City or be

239 found on land annexed into the City, the following language section on springs is included.

240 Spring flow occurs at points where the potentiometric surface of the Floridian aquifer is above

241 the land surface and where the confining bed overlying the aquifer has been breached.

242 According to the FDEP, the major issues impacting the health of the springs include population

243 growth, urban sprawl, growing demand for groundwater, and introduction of fertilizers,

244 pesticides, and other pollutants to the spring sheds.

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I. Air Quality

There are no air monitoring stations located in Lake Helen and there are no air-polluting industries in the city. According to the United States Environmental Protection Agency (EPA) the air quality in the general area of the city is good with an AQI score of 36 as of 2/10/16.

J. Wildlife and Vegetative Communities; Threatened and Endangered Species

There is no specific data to describe the distribution and abundance of plants or wildlife within Lake Helen. Thus, no information is available documenting the occurrence of species listed by U.S. Fish and Wildlife Service or Florida Game and Fresh Water Fish Commission as endangered, threatened or of special concern. Nonetheless, some protected animals and plants found elsewhere in Central Florida are known to use habitat types similar to those found within the City.

1. Ecological Communities

Ecological communities are defined according to two broad categories: uplands and wetlands. The upland communities found within the City of Lake Helen are Pine Flatwoods, Sand Pine, Upland Hardwood Forests, and Upland Mixed Coniferous/Hardwood (Map 6-5). The wetland communities found within the City include: Mixed Wetland Hardwoods, Cypress, Hydric Pine Flatwoods, Wetland Forested Mixed, Freshwater Marshes, Wet Prairies, Emergent Aquatic Vegetation and Mixed Scrub-Shrub Wetland.

In the discussion of specific upland and wetland communities, the Florida Land Use Cover and Forms Classification System (FLUCCS) numbers are associated with the community's title. These ecological communities are comprised of flora and fauna that provide important aquifer recharge capacities while wetlands provide important ecological functions which affect surface water quality and quantity. These communities serve as noise barriers, reduce pollutants, modify temperature extremes, provide habitat for wildlife, resources for recreation, and scientific research. Numerous rare species that have been sighted in Volusia County use these communities as habitat.

Central Florida supports diverse plant communities owing to its transitional semi-tropical climate. The well-defined rainy seasons and flat, low-elevation topography, form distinct and persistent upland and wetland habitats.

287 No specific data are available to describe the environmental conditions of these habitats
288 within Lake Helen. Due to limited research funds, it was not possible to analyze these
289 areas extensively. Instead, general features likely associated with these habitats were
290 derived from Twenty-six Ecological Communities of Florida, published by Soil
291 Conservation Service in 1981. In general, all natural areas are prized for serving as noise
292 buffers and providing visual relief in increasingly urbanized landscapes. Uplands are also
293 important aquifer recharge sites, whereas wetlands store stormwater runoff and filter
294 pollutants.

295
296 2. Pine Flatwoods (FLUCCS Code 4110)

297
298 The largest area of this community is located within the northeastern boundary of the
299 City and a small area within the northwestern boundary. Water movement is very
300 gradual to the natural drainage ways, swamps, marshes and ponds associated with this
301 community. During the rainy season, usually June through September, this community
302 may have water on or near the soil surface. The soils are deep, acidic, poorly drained
303 and coarsely textured. This community is easily identified by the flat topography with
304 pine and palmetto vegetation. Fire and water are the major stress conditions here, with
305 fire controlling the introduction of hardwoods. The Pine Flatwoods is host to a diverse
306 and numerous wildlife populations. Many larger animals are found in areas where the
307 flatwoods join other communities. These ecotones provide nesting sites, den sites, food
308 and cover. Flatwood communities are good cellulose producers and are extensively
309 used for timber production.

310
311 3. Sand Pine (FLUCCS Code = 4130)

312
313 This small community is located in the extreme southeastern portion of the City.

314
315 4. Upland Hardwood Forests (FLUCCS Code 4200)

316
317 This community is located in the southeastern portion of the City and a small area in the
318 western portion of the City.

319
320 5. Upland Mixed Coniferous/Hardwood (FLUCCS Code 4340)

321
322 Small pockets of this community are dispersed throughout the City.

323
324 6. Wetlands are present within the City of Lake Helen (Map 6-2 and Map 6-5). The City has
325 diversity in its wetlands. Wetland Forested Mixed (FLUCCS Code 6300) and Mixed
326 Scrub-Shrub Wetland (FLUCCS Code 6460) tend to be the dominant types.

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328 a. Bay Swamp (FLUCCS Code 6110)

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This small community is located along the northern boundary of the City. It is composed of dominate trees such as loblolly bay, sweetbay magnolia, swamp bay, with slash pine and loblolly pine as an associated component at times. Large gallberry, fetterbush, wax myrtle and titi are included in the understory vegetation.

b. Mixed Wetland Hardwoods (FLUCCS Code 6170)

This small community is located along the eastern boundary of the City and is comprised of a variety of hardwood species tolerant of hydric conditions.

c. Cypress Swamp (FLUCCS Code 6210)

The Cypress Swamp ecological community occurs along rivers, lake margins, prairies and strands, or interspersed throughout other communities such as flatwoods and prairies. This community is poorly drained and water is at or above ground level a good portion of the year. Soils associated with this community have loamy sub-soils and sandy surfaces. This community has a relatively low diversity of plant species due to the fluctuating water levels and low nutrient availability. Bald cypress is the dominant tree and is often the only tree which occurs in significant numbers. Pond cypress occurs in cypress heads or domes which are usually found in flatwoods and prairies. Fire is a stress factor in drier areas but water is important in all areas, as natural regeneration of cypress requires fluctuation of water levels. The diversity of trees increases in strands and stream margins because of increased nutrient availability. Small Cypress Swamp communities are located in conjunction with Wetland Forested Mixed community located within the northeastern section of the City.

d. Hydric Pine Flatwoods (FLUCCS Code 6250)

Several small communities occur within the northwestern, western and eastern boundaries of the City. The dominant tree canopy is Slash pine with an understory of grasses, wiregrass, forbs and scattered saw palmetto.

e. Wetland Forested Mixed (FLUCCS Code 6300)

368 Several large areas of this community are located within the northeastern,
369 eastern, northwestern and western boundaries of the City. It appears to be the
370 largest dominant wetland system within the City.

371

372 f. Freshwater Marshes (FLUCCS Code 6410)

373

374 Several small pockets of this community are located within the northeastern,
375 northern, southern and southeastern boundaries of the City. Sawgrass and
376 cattail are the predominate species in freshwater marshes. Other species may
377 include arrowhead, maidencane, cordgrass and bulrush.

378

379 g. Wet Prairies (FLUCCS Code 6430)

380

381 Several small pockets of this community are located within the northeastern and
382 southern boundaries of the City. This community is composed predominately of
383 grassy vegetation on hydric soils. The species associated with this community
384 may include sawgrass, maidencane, cordgrasses, yellow-eyed grass and
385 swampplilly.

386

387 h. Emergent Aquatic Vegetation (FLUCCS Code 6440)

388

389 Several small areas of this community are located within the southern,
390 southeastern and northeastern boundaries of the City. Wetland plant species
391 include both floating vegetation and vegetation which is found either partially or
392 completely above the surface of water. Vegetation typically includes water
393 lettuce, spatterdock, water hyacinth, duck weed, and water lily.

394

395 i. Mixed Scrub-Shrub Wetland (FLUCCS Code 6460)

396

397 These communities are located within the northeastern, eastern, southern and
398 northwestern boundaries of the City. This community is associated with
399 topographic depressions and poorly drained soils. Associated species may
400 include cypress, willows and other low shrub with no dominate species.

401

402

404 K. Species of Special Concern

405

406 There are no known species of special concern in the city.

407

408 L. Significant Natural Resources

409
410 The most significant natural resources which are located in the city limits are the lakes, the
411 wetlands and the remaining undisturbed naturally occurring upland vegetative communities.
412 The lakes offer great aesthetic value as well as recreational value and are the natural recipients
413 of stormwater from overland flow, defined channel flow (creeks, streams and ditches), wetland
414 flow and groundwater flow. They have obvious value for floodwater storage during intense and
415 long duration storms. The wetlands offer great beauty, act as habitat for many mammal,
416 reptile and bird species and serve as a natural treatment system to help remove pollutants
417 from stormwater passing through the wetland. The naturally occurring upland vegetative
418 communities that have not been disturbed by agricultural, residential, commercial or industrial
419 development not only have aesthetic value and provide habitat but these areas do not
420 contribute to pollution of wetlands and lakes as do areas that have been developed without
421 consideration of these effects. Therefore, the remaining natural upland areas will not require
422 the expenditure of time and money to mitigate deleterious effects of previous development,
423 assuming that these areas are conserved or developed with the proper safeguards.

424

425

426 M. Absent Natural Resources

427

428 There are no rivers, bays, estaurine marshes, fisheries or marine habitat within the City of Lake
429 Helen.

430

431 **VI-3. BENEFITS DERIVED FROM NATURAL RESOURCES**

432

433 A. Commercial

434

435 There are no commercial benefits derived from the natural resources located within the city
436 other than that which is associated with silviculture. Their primary benefits lie in the aesthetic
437 contribution to the quality of life, and the role that such natural resources play in protecting the
438 environment against further degradation.

439

440 B. Recreational and Conservation Uses

441

442 The 65 acres of lakes within the city offer a variety of recreational uses. These uses include
443 boating, swimming and recreational fishing. The surrounding forest areas provide a panorama
444 for active and passive recreational uses. Among the active uses are hiking and horseback riding.
445 The passive activities include picnicking and similar group gatherings. But perhaps of the
446 greatest import is the role these natural resources play in conserving and protecting the
447 environment. The City of Lake Helen is fully cognizant of these roles and contributions and has
448 adopted measures to assure the continued availability of these natural resources. The city
449 ordinances pertaining to the protection and stormwater runoff are considered to be more
450 restrictive than that specified by the state or county.

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VI-4. IDENTIFICATION OF KNOWN POLLUTION PROBLEMS

A. Septic Tanks and Drainfields

As indicated in Map 6-8 a portion of the land within the city limits consists of soil which offers severe or moderate limitations for the use of septic tanks, particularly in the extreme northeast and northwest sectors. If developed, a site specific investigation by an Engineer or soils scientist is a minimum requirement for determining that the drainfields can work properly if certain conditions are met. The possibility of contamination of drinking water supplies from septic tank leachate in areas of severe or moderate limitation is usually handled by the provision of a central water system.

Elimination of septic tanks and drainfields and the installation of a gravity collection system in developed areas is often costly due to the reconstruction of roads and the accommodation of existing structures.

B. Landfill Operations

Currently all solid waste is collected and disposed of by a franchised hauler. The present landfill that is the disposal site for Lake Helen solid waste is the Volusia County Landfill. The former landfill site is not a known pollution problem but all former landfill sites (pre-1980) have the potential for being a source of pollution for groundwater and surface water. The site is monitored on a routine basis to ensure that no harmful effects upon the environment are present.

C. Stormwater Runoff

Land use coverage is a significant indicator of nonpoint source pollution. Nonpoint source pollution is difficult to monitor because of the diffuse and intermittent nature of discharges. The fact that most nonpoint pollution occurs during the "first flush" of rainfall following a storm event adds to the difficulty of nonpoint source monitoring. Nonpoint pollution it is generally associated with runoff water from the surface that carries with it sediment, organic material, nutrients, and toxins into receiving waters. Under some circumstances ground water can become contaminated by water percolating down through the soil. The nonpoint source discharges in the City of Lake Helen are from agricultural and urban land uses. The Department of Environmental Protection, Florida's water management districts, Department of Agriculture and Consumer Services, Department of Health, local governments, and the public implement the State of Florida's Nonpoint Source Management Program. Their goal is to mitigate nonpoint source pollution from new land use activities and to reduce pollution from existing activities. The Nonpoint Source Management Section administers the following programs:

- 493 • State Stormwater Management Program Coordination
- 494 • State Nonpoint Source Management Program
- 495 • Clean Lakes Program

496
497

498 **Total Maximum Daily Loads (TMDL)**

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500 A Total Maximum Daily Loads (TMDL) is the maximum amount of a given pollutant that a water
501 body can absorb and still maintain its designated uses (e.g., drinking, fishing, swimming,
502 shellfish harvesting). Under Section 303(d) of the federal Clean Water Act and the Florida
503 Watershed Restoration Act, TMDLs must be developed for all waters that are not meeting
504 their designated uses and, consequently, are defined as “impaired waters.”

505

506 Through the TMDL program the following goals are expected to be accomplished. (1)
507 Cleaner water through more collaborative restoration efforts, with increased public
508 involvement. (2) Better use of Science to understand the human activities affecting water
509 resources in specific locations and cumulatively throughout our watersheds. (3) Better
510 Protection for water bodies, as people give more attention to preventing and reducing human
511 impacts on water resources. (4) TMDLs will be developed, allocated, and implemented through
512 a watershed-based management approach (managing water resources within their natural
513 boundaries) that addresses the state’s 52 major hydrologic basins in five groups.

514

515 The Department of Environmental Protections TMDL Program objectives will be carried out in
516 the Middle St. Johns River Basin through close coordination with the efforts of key stakeholders
517 and initiatives such as the St. Johns River Water Management District (SJRWMD); the East Central
518 Florida Regional Planning Council; Volusia, Lake, Orange, Seminole and Volusia counties; the
519 cities of Altamonte Springs, Casselberry, DeBary, Deltona, Eatonville, Edgewood, Lake Helen,
520 Lake Mary, Longwood, Maitland, Orlando, Oviedo, Sanford, Winter Park and Winter Springs;
521 the Florida Audubon Society; Orange Audubon; Friends of the Wekiva; Friends of Lake Jesup;
522 and The Nature Conservancy

523

524 **Basin Management Action Plan (BMAP)**

525

526 The Basin Management Action Plan (BMAP) serves as the total maximum daily loads
527 implementation plan. The sole purpose of this plan is for equitable reduction of pollutant
528 loadings to meet the TMDLs established for an impaired water body. The City of Lake
529 Helen does not currently have a BMAP.

530

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534

535 **VI-5. WATER RESOURCES**

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537 **A. Existing Demand**

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539

540 The City currently operates three (3) wells located throughout the City’s utility service area.
541 The three wells are interconnected. The location of the City wells is shown on Map 6-3. A
542 summary of each well is provided in Table 6-1. All development within the City is connected to
543 the municipal water system. The majority of the service connections are for residential use.
544 Many residents have private wells that are used for watering of lawns, washing of automobiles,
545 and purposes which do not require potable water.

546

547

548 **Table 6-1: Summary of Water Sources**

Well or Pump Number	Well field or Facility Name	Casing Diameter (in.)	Casing Depth (ft.)	Total Depth (ft)	Pump Capacity (in gpm)	Date Drilled
1	Blake Park	10	120	350	350	1986
2	John Street	10	120	344	350	1969
3	Lemon Ave.	12	108	350	350	1990

549

550 The historical groundwater withdrawals from the wells are shown in Table 6-2 below.

551 **Table 6-2: Historical Groundwater Withdrawals**

552

Year	Historical Groundwater Withdrawals (MGal)	CUP Groundwater Allocation (MGal)
2010	106.374	105.49
2011	99.402	105.85
2012	95.849	106.58
2013	88.540	107.31
2014	83.680	108.77

553

554

555

557 Water consumption within the City of Lake Helen is essentially that needed for household
558 purposes. The city does not have a significant industrial base nor is one contemplated in the
559 foreseeable future.

560 **B. Ten-Year Projected Demand**

561

562 The City’s population is projected to decline throughout the short term and long term planning
563 period. The City’s existing Consumptive Use Permit (CUP) was issued May 27, 2009 (permit

564 #382). This enables the City to withdraw a maximum annual of 118.26 million gallons of water
565 a year by 2029 on a sliding scale from 105.12 million gallons in 2009. Maximum annual ground
566 water withdrawals from the Florida aquifer from all wells listed in the CUP application must not
567 exceed as follows:

568
569 **Table 5-2: CUP Groundwater Allocation**
570

Year	Million Gallons (mgd)
2009	105.12
2010	105.49
2011	105.85
2012	106.58
2013	107.31
2014	108.77
2015	110.23
2016	112.42
2017	114.25
2018	116.07
2019 - 2029	118.26

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575

576 1. Cones of Influence. There is presently no existing data on the actual cone of influence of
577 the city's wells. Chapter 17-22 of the Florida Administrative Code requires a minimum setback
578 from any well of 100 feet from a "sanitary hazard" (which can include stormwater detention
579 areas) and 200 feet from any septic tank and drainfield. Until any further data is collected or
580 studies performed, the primary cone of influence should be assumed to be a radius of 200 feet
581 and a radius of 500 feet for secondary zone protection.

582
583

584 **VI-6. THE CONSERVATION PLAN**

585

586 Given that protection and conservation of the city's natural resources is essential to
587 maintenance of those quality of life features that residents of the community deem necessary
588 to create a certain ambiance which enhances the desirability of residing in the area it is
589 incumbent upon local officials to meet these needs and demands of the citizenry. This plan
590 addresses those needs and demands and provides recommended objectives and policies
591 designed to satisfy that goal. Effective implementation and monitorship of the proposed
592 actions is essential to the wellbeing of the community.

593

594 There are two general areas of the City with the least environmental constraints and they are
595 located within the southeastern and southwestern portions of the City.

596

597 A. Air Quality

598

599 Air quality within the City of Lake Helen is considered good. Although there are no facilities
600 within the city to provide effective monitoring of the ambient air quality The City of Lake Helen
601 is not likely to have an air quality monitoring capability within the foreseeable future. The city
602 must rely upon other resources for information relevant to its air quality. B. Potable Water

603

604 The quality of the potable water provided by the municipal water supply system is good. Only
605 chlorination is required to meet state standards for potable water. The water is monitored by
606 operating personnel to assure compliance with these standards. However, the mere meeting of
607 state standards for quality does not address the total problem of maintaining an adequate
608 supply of water.

609

610 A water supply system is dependent upon two essential and inter-related factors. First, there
611 must be an adequate source of water that is treatable so as to attain the required quality. The
612 city has three waterwells that provide an adequate source to meet current and projected
613 demand.

614 There are several factors that must be considered in maintaining the ability of the municipal
615 water supply system to meet projected needs. Among the more important of these factors are:

616

617 1. Effective operating capacity. Although a water supply system might be designed to
618 provide a given supply of water that alone is not sufficient to meet system needs. The ability of
619 the system to provide the needed demand to the desired site at the time of need is the true
620 test of the system. This entails periodic evaluating of the system to ascertain flow pressures and
621 corrective action when and where such is indicated.

622

623 2. Average daily per capita usage. System requirements are proportional to the average
624 daily per capita usage. The current usage of 88 gallons per day per capita is not excessive.

625 3. Population. The most important planning tool for managing the municipal water supply
626 system in such a way that demand will be met is a valid estimate of residents within the area of
627 service.

628 C. Surface Waters

629

630 Surface waters play a dominant role in the everyday life of citizens of the community. There are
631 some 65 acres of lakes within the corporate limits of the City of Lake Helen.

632

633 Lake levels fluctuate naturally in response to variations in rainfall, evaporation, surface and
634 ground water inflow and outflow. Differences in the magnitude of lake level fluctuations relate
635 primarily to variability in the subsurface thickness and permeability of the watershed. This

636 determines the extent that rainfall runs off the land surface or percolates down to the water
637 table; it also determines the extent to which water from the surficial aquifer moves down to
638 the Floridan aquifer. Lakes in recharge areas generally fluctuate more widely than lakes
639 in discharge areas.

640
641 The Florida Trophic State Index (TSI) is a measure of water quality that uses algae and nutrient
642 content to categorize lakes into the four categories below.

- 643
- 644 • **Oligotrophic** Clear waters with little organic matter or sediment and minimum biological
645 activity
 - 646 • **Mesotrophic** Waters with more nutrients, and therefore, more biological activity
 - 647 • **Eutrophic** Waters extremely rich in nutrients, with high biological productivity. Some
648 species may be choked out.
 - 649 • **Hypereutrophic** Murky, highly productive waters, closest to the wetland status. Many clear
650 water species cannot survive.

651
652 At this time there are no monitoring stations within the existing lakes.

653
654
655
656
657

658 D. Flood Plains

659
660 Floodplains are areas inundated during a 100-year flood event, as determined by the Federal
661 Emergency Management Agency's (FEMA) flood insurance rate maps. The 100-year flood has
662 been adopted by the Federal Insurance Administration (FIA) as the base flood for purposes of
663 floodplain management. Floodplains slow the velocity of storm water run-off and are
664 valuable as wildlife habitats and groundwater recharge zones.

665
666 Flooding may occur throughout the year, but it is most common during the rainy season, from
667 June to October. The potential for the most severe flooding is from rainfall associated with
668 hurricanes and tropical storms or when the ground has been saturated from previous
669 rainfall. Most floodplains occur within wetlands and around surface waters. Therefore,
670 they are substantially protected from development.

671
672
673

674 E. Wetlands

675
676 There are some 360 acres of land within the City of Lake Helen that are classified as wetlands
677 and waterbodies. These wetlands play a significant role in the conservation and protection of

678 natural resources within the area. Sediments and nutrients from upland development can
679 overload and damage the natural system thereby turning the wetlands into a settling basin of
680 polluted and unpleasant-smelling water. The overload runoff is a natural process which in itself
681 is not harmful to the wetlands. Wetlands will become overloaded if the speed of the runoff or
682 the erodibility of the upland soil is increased - or both.

683
684 A wetlands protection buffer will slow runoff from upland development which facilitates
685 filtration of pollutants and sediments before the runoff enters the wetlands. This is essential to
686 the maintenance of the wetlands area. Such a protection buffer will also provide a transition
687 zone to prevent development from impacting and encroaching upon the wetlands.

688
689 The City of Lake Helen imposes a 25 foot buffer around wetlands in conformance with Volusia
690 County Ordinance 88-15, which is applicable to all local governments in the county. The County
691 notes in their publication entitled "Minimum Standards For Environmental Protection" that the
692 25 foot buffer requirement has been established as a way of protecting the functional values of
693 wetlands and ensuring that no net loss of wetlands occurs within the county.

694
695 Generally, setting aside buffer zones between a wetland and a developed upland area helps to
696 protect the integrity of the wetland's water supply, its water quality and associated wetland
697 dependent species. Due to the urban nature of a City (where there is not substantial wildlife
698 habitat value) the principal benefit of a buffer to Lake Helen is its ability to control
699 sedimentation by insuring that sediment eroded from surrounding uplands and deposited in a
700 wetland does not act to fill the area. This prevents the creation of an upland from deposited
701 material where there once was a wetland. The UF Center for Wetlands has noted in their
702 studies that, since sediment is relatively large- grained and settles out in relatively short
703 distances, the buffers required for sediment control can be relatively small. It is estimated that
704 for sand, a 25 foot buffer will allow for deposition of nearly 80 percent of the material within
705 the buffer.

706
707 Buffers within the City are required to include canopy, understory and groundcover consisting
708 of preserved existing vegetation or planted native species. In implementing these buffer
709 requirements the City relies on the expertise of the County's environmental specialists to
710 ensure that the City's wetland policies and standards are correctly applied.

711
712 Current zoning requires a setback of 75 feet from the water edge of lakes. Additionally, one of
713 the proposed actions to alleviate the stormwater runoff problem would require a berm
714 between all developed lakefront property and the water edge of the lake. Such a berm would
715 be 12 inches high and would be located 25 feet upland or at an elevation of three feet above
716 the mean high water mark of the lake. All of the area between the berm and the water would
717 have to remain in its natural state or replanted with native vegetation. This littoral area must be
718 maintained and revitalized so that it can perform the function intended by nature. This buffer

719 system will provide sorely needed protection to the lakes and the wetlands that fall within this
720 area.

721
722 Wetlands are under the jurisdictional control of the St. Johns River Water Management District
723 (SJRWMD). Although wetlands within the city have been identified on the Future Land Use Map
724 the basis for that identification is not adequate to pinpoint the parameters of the wetland
725 areas.

726 E. Aquifers and Recharge Areas

727
728 As stated earlier the City of Lake Helen is situated along the Deland Ridge at a point where it
729 meets the Talbot Terrace. Significantly, the area east of the city is part of the primary aquifer
730 recharge area. It also accounts for the relative shallow depth to both the surficial aquifer and
731 the Floridan aquifer (approximately 33 feet NGVD.) Thus there is a clear need to protect the
732 area so that it might perform its vital recharge function.

733
734 There is a potential for contamination of the aquifers due to the reliance upon septic tanks and
735 drainfields for disposal of wastewater. Tests conducted as part of the previous stormwater
736 runoff study failed to find any significant leachate accumulation within the lakes. One factor
737 that mitigates against contamination from leachate is the relative density of development.
738 Given the current authorized density of three dwelling units per acre the potential for
739 contamination of the aquifers is somewhat diminished.

740 The obvious solution to correcting the potential problem is to construct a central wastewater
741 collection, transmission and treatment facility. The cost of constructing such a facility is
742 prohibitive insofar as the fiscal capacity of the City of Lake Helen is concerned. The City of
743 Lake Helen has considered the construction of a local wastewater collection, transmission
744 and treatment facility and has consistently rejected that option. The use of septic tank
745 systems is considered to be adequate.

746 747 748 G. Soils

749
750 There are 21 major soil groups within the city. Some of these groups are not conducive, to
751 varying degrees, to the use of septic tanks and drainfields (Map 6-8). Approximately 188 acres
752 of these soils types (not including the wetlands and waterbodies) have limitations to septic
753 tanks; however, the majority of these soils are located within the northeast section of the city.

754 The Future Land Use Plan gives due consideration to the constraints imposed by soil
755 characteristics. Those areas containing soil groups which offer severe limitations to the use
756 of septic tanks and drainfields are classified as "Conservation - Protected." Development in
757 these areas is limited to a density of 0.2 dwelling units per acre; a dual septic tank and
758 drainfield system; and availability of a potable water supply system. An alternative is a
759 Residential Planned Unit Development wherein all infrastructure requirements are satisfied by
760 the developer. Those areas that offer moderate limitation to the use of septic tanks and

761 drainfields are classified as "Conservation-Restricted" and are limited to a density of 0.5
762 dwelling units per acre. Thus it is clear that the city of Lake Helen considers soil characteristics
763 a significant factor in its land use planning.

764

765 H. Wildlife and Vegetative Communities; Threatened and Endangered Species.

766

767 There are five (5) ecological plant communities found within the corporate limits of the city.
768 These ecosystems have close associations with soil types, vegetative communities, and wildlife
769 communities. Each community type offers distinct benefits and are therefore valued natural
770 resources. The protection and conservation of these ecosystems is an environmental
771 necessity. A thorough discussion of each ecological plant community was provided at
772 subsection VI-2(J) above. What remains is a discussion of measures to ensure the survivability
773 of the ecosystem.

774

775 Management of the natural vegetative community is the key to assuring the survivability of the
776 ecological plant community. While it is the whole that must ultimately be evaluated to
777 determine the effectiveness of the management program it is through adoption of specific
778 ordinances pertaining to components of the ecosystem that such a management system is
779 normally instituted. Within the City of Lake Helen the following specific measures have been
780 adopted.

781

782 (1). Trees. The city has a strict tree ordinance which is based on the canopy concept. This
783 assures adequate trees to provide food and nesting areas for those wildlife animals requiring
784 such a habitat. There are no restriction on the removal of citrus trees or those trees which are
785 considered to be noxious to the area. This includes: the Australian Pine; the Brazilian Pepper;
786 and the Cajiput.

787

788 (2). Minimum standards for environmental protection. The city has adopted a set of
789 standards that exceed the state and county requirements. These standards apply to all
790 development within the city and are designed to prevent damage to the natural resources due
791 to stormwater runoff. Significantly, the first inch of all stormwater from impervious surfaces
792 must be retained on site.

793 (3). Buffer areas. The City requires upland buffers adjacent to all wetlands.

794

795 (4). Wetlands. All areas that contain soils which are classed as being characteristic of that
796 found within wetlands have been identified within the Future Land Use Plan as "Wetlands."
797 Development within these areas are subject to the receipt of a permit from the St. Johns River
798 Water Management District and approval by the City of Lake Helen.

799

800 (5) Soils. Given the sensitive nature of soils within the area the Future Land Use Plan imposes
801 very restrictive measures upon development within these areas.

802

803 Cumulatively these measures form a viable management program for the protection and
804 conservation of the vegetative communities. Given that these measures are effective the result
805 should provide a natural habitat that will support the wildlife of the area.

806

807 1. Hazardous Waste

808

809 There is a landfill within the corporate limits of the city which was closed in the early 1980s.
810 Solid waste is collected by a franchised hauler and disposal is facilitated at a Volusia County
811 landfill located some 15 miles from the city. There are no hazardous underground storage
812 tanks within the city.

813

814 The disposal of hazardous waste is accomplished in a special manner. Individual generators of
815 hazardous waste are responsible for the collection and transfer of such material to the Volusia
816 County Hazardous Waste Disposal site which is also located at the Volusia County landfill. This
817 material can be delivered daily. Semi-annually the Hazardous Waste Disposal facility allows all
818 hazardous waste to be turned in free of charge. This information is publicized in all of the local
819 newspapers. Additionally, petroleum-based waste products can be turned in at various
820 automotive service centers located within the city.

821

822 The City of Lake Helen has augmented the county-wide process for disposal of hazardous waste
823 in a rather unique manner. A local civic organization operates a recycling collection center.
824 On a monthly basis this civic group positions a trailer adjacent to City Hall for the collection of
825 these recyclable products. This group has agreed to collect Hazardous Waste products and to
826 store these materials in a secure area. Subsequently, and on a periodic bases, these materials
827 are transported to the Hazardous Waste Disposal site. Notification of this service is posted at
828 the collection site and regularly announced at meetings of the City Commission.

829

830 J. Miscellaneous Natural Resources

831

832 The following comments pertain to requirements but which are considered to be of such minor
833 significance within the city that there inclusion within the goals, objectives and policies of this
834 element is not warranted.

835

- 836 1. There are no known commercially valuable minerals within the city.
- 837 2. There are no estaurine waters or marshes within the city.
- 838 3. There are no fisheries within the city.
- 839 4. There are no rivers or harbors within the city.
- 840 5. Although there are 65 acres of lakes within the city there are no freshwater beaches.
- 841 6. There are no existing natural reservations within the city.
- 842 7. There are no unique vegetative communities that are located both within the city and
843 the adjacent County of Volusia.

844 8. There are no land areas within the city that have been designated as "environmentally
845 sensitive lands for protection" other than that which is included as "Wetlands," "Conservation-
846 Protected," and "Conservation-Restricted." These areas are so designated due to the soil
847 characteristics of the respective areas. That determination was made deliberately so as to
848 further the goals and objectives of the Conservation Element.
849
850