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**V-1. INTRODUCTION**

This element provides an inventory and analysis of five public facilities: sanitary sewer, solid waste, stormwater management, potable water, and natural groundwater aquifer recharge. Analysis accomplished herein was used to develop appropriate goals, objectives and policies that will implement public facilities required by existing and future development within the City of Lake Helen.

Population growth affecting water, sanitary sewer, solid waste, drainage and natural groundwater aquifer is expected to decline in the short term (2021) and long term (2035) planning period.

**Table 5-1: Population Projections**

| Year | Total Population |
|------|------------------|
| 2000 | 2,743            |
| 2010 | 2,624            |
| 2015 | 2,619            |
| 2020 | 2,600            |
| 2025 | 2,570            |
| 2030 | 2,534            |
| 2035 | 2,511            |

Source: Shimberg Center for Housing Studies

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**V-2. INVENTORY AND ANALYSIS**

The only municipal facility which provides services to the city's residents is the central water supply system. The city does not have a central wastewater collection, transmission and treatment facility. Solid waste is disposed of through the use of a franchised hauler with subsequent disposal at the county landfill. The City of Lake Helen has limited existing drainage facilities. A natural groundwater aquifer recharge area is located nearby which requires that the city give due consideration to the impact that development would have upon this natural resource. Each of these components of this element are discussed in detail in the following subsections.

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**A. Sanitary Sewer**

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The City of Lake Helen does not operate a wastewater treatment facility and reclaimed water is not available for use. Residential and non-residential developments rely on septic tanks and

58 drainfields to perform this function. Such systems must provide service consistent with the  
59 adopted level of service standards and meet the guidelines established by the Volusia County  
60 Health Department. The Florida Department of Health and Rehabilitation Services (DHRS)  
61 regulates septic tank and drainfield installation within the state. These requirements have been  
62 adopted by rule in Chapter 10D-6, F.A.C. The Volusia County Health Department regulates and  
63 approves septic systems within the City. A percolation test and studies of the soil are used to  
64 determine size, siting and type of individual systems. The City ensures that the following  
65 guidelines regarding septic tank locations are enforced during the development review process:

- 66           ▪ 200 feet from sewage disposal system to any public water well;
- 67
- 68           ▪ 75 feet from any sewage disposal system to any private water well;
- 69
- 70           ▪ 75 feet from the high water line of any lake, canal, stream or other body of
- 71           water. Lots created prior to 1972 require 50 feet from the high water line of any
- 72           surface;
- 73
- 74           ▪ 10 feet from any water main or service line installed below the ground;
- 75
- 76           ▪ 5 feet from the property line and building foundations; and
- 77
- 78           ▪ Septic tank inlet shall be within 15 feet of plumbing stub out.
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80  
81 Effluent from septic tank systems is discharged to the drainfield where it is allowed to percolate  
82 into the soil. Soil permeability and depth to the water table are limiting factors on septic tank  
83 performance. No systematic monitoring program is presently conducted by the City, County, or  
84 State for the purpose of evaluating the performance of septic systems. System checks are  
85 done on a compliance basis.

86  
87 In the City during 2015, there was no evidence of pollution resulting from septic systems not  
88 functioning properly. The Volusia County Health Department responds to requests or  
89 complaints concerning a potential problem of a malfunctioning septic system. This agency,  
90 upon finding a problem, will issue an order to correct the situation within a certain period of  
91 time.

92  
93 The City is located near a prime Floridian Aquifer recharge area, but at the present time there is  
94 no available data indicating that septic tanks within the City are resulting in either surficial or  
95 Floridian aquifer contamination. The low density development within the City is within State  
96 guidelines and does not appear to have any negative impact on the surficial or Floridian aquifer  
97 resources.

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100 The Florida Department of Environmental Regulation (FDER) issues permits for sanitary sewer  
101 systems having a capacity exceeding 5,000 gallons effluent and maintains an inspection  
102 program for operation and permit compliance. There is one (1) wastewater package treatment  
103 plant within the city which is associated with an existing mobile home park known as Lake  
104 Helen Villas.

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#### 110 B. Solid Waste

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113 The City of Lake Helen does not provide a solid waste disposal service. All solid waste is  
114 handled by a franchised hauler that is approved and monitored by Volusia County. All solid  
115 waste is transported to the Volusia County landfill which is located some 15 miles from the city  
116 and serves the entire county. There are no other solid waste disposal sites within the County  
117 of Volusia. It is assumed that these franchised haulers will be required to comply with state  
118 procedures for solid waste disposal once the implementing directives are received at the  
119 local level. The role of the city will be to ensure that all residents and businesses within the city  
120 comply with the state and county directives.

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129 Information provided by the franchised hauler indicates a current level of service of 8.6 pounds  
130 per capita per day.

131 There is a former landfill site located within the city. This facility was closed in the early 1980s.  
132 The site is monitored on a routine basis and is not a known source of pollution. However, all  
133 pre-1980 landfill sites are considered as a potential source for contamination of groundwater  
134 and surface water.

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#### 136 C. Drainage

138 Drainage and storm water runoff is a recognized problem within the City of Lake Helen. The  
139 city is located along the eastern edge of the Deland Ridge where it meets the Talbot Terrace.  
140 Based on geological records the Deland Ridge appears to be an ancient marine terrace which  
141 formed when the ocean level was much higher than it is today. This once flat surface has been  
142 altered by erosion and the collapse of caverns (sinkholes) formed by the solvent action of water

143 in the underlying limestone. The local relief on the Deland Ridge is greater than any other  
144 region in Volusia County. These conditions combine to create a series of lakes and drainage  
145 basins within the city.

146  
147 There are numerous lakes within the city. Three of these lakes are larger than 10 acres in size.  
148 Lake Helen is the largest with an area of nearly 26 acres, followed by Lake Harlan at 22 acres,  
149 and Lake Macy at 18 acres. There are several smaller lakes which vary in size from eight acres  
150 to less than one acre of surface water area. Most of the lakes are totally land-locked and all  
151 are relatively shallow.

152  
153 The City of Lake Helen has limited drainage facilities within its corporate boundaries. These  
154 facilities are inadequate to control the stormwater runoff that occurs as a result of a significant  
155 rainfall event. Given the number of drainage basins and sub-basins that exists within the city  
156 the provision of traditional collection, transmission and disposal facilities is beyond the fiscal  
157 capacity of the municipality. Conversely, the provision of a system of retention and detention  
158 areas offers a feasible alternative for the control of stormwater runoff. This alternative has  
159 been adopted by Volusia County in its "Minimum Standards for Environmental Protection"  
160 ordinance. The aforementioned study also proposes this methodology as a means of  
161 attenuating the stormwater runoff and drainage problem. Given the goal of controlling  
162 stormwater runoff so as to prevent untreated water from entering the lakes found in the area  
163 this alternative seems appropriate and feasible. The use of retention and detention areas, with  
164 treatment as required, should reduce the problem to a manageable level. Traditional drainage  
165 systems could then be applied where a given need is indicated.

166  
167 The City of Lake Helen has addressed the problem of drainage and stormwater runoff in a very  
168 positive manner. Recognizing the magnitude of the problem and the adoption of the standards  
169 by Volusia County the City of Lake Helen has amended its Code of Ordinances such that  
170 standards within the city exceed that established by state, regional planning council, water  
171 management district and Volusia County. Significantly, storm water runoff measure now  
172 require retention of the first inch of rainfall as contrasted to the common standard of one-half  
173 inch. The only exceptions are for impervious surfaces of less than 1,000 square feet and land  
174 areas of less than 5,000 square feet. Additionally, the city had adopted the concept of using  
175 retention and detention areas, supplemented by traditional drainage systems, as a  
176 methodology for managing the stormwater runoff problem.

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178 D. Potable Water

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180 The City of Lake Helen obtains its potable water from the Floridan aquifer. The existing water  
181 supply system operated by the City consists of two (2) major components: the well/water  
182 plants that withdraw the ground water for storage and disinfection, and a distribution system  
183 that consists of various sizes of water main piping.

184

185 The City currently operates three (3) wells located throughout the City’s utility service area.  
 186 The three wells are interconnected. The location of the City wells is shown on Map 5-3. A  
 187 summary of each well is provided in Table 5-1. All development within the City is connected to  
 188 the municipal water system. The majority of the service connections are for residential use.  
 189 Many residents have private wells that are used for watering of lawns, washing of automobiles,  
 190 and purposes which do not require potable water.

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**Table 5-1: 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         |

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The City’s existing Consumptive Use Permit (CUP) was issued May 27, 2009 (permit #382). This enables the City to withdraw a maximum annual of 118.26 million gallons of water a day by 2029 on a sliding scale from 105.12 million gallons in 2009. Maximum annual ground water withdrawals from the Florida aquifer from all wells listed in the CUP application must not exceed as follows:

**Table 5-2: CUP Groundwater Allocation**

| 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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The historical groundwater withdrawals from the wells are shown in Table 5-3 below. As indicated in the table, usage has decreased. This decrease can be associated with the decline of population that the City has experienced since 2000.

209 **Table 5-3: Historical Groundwater Withdrawals**

| 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                            |

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218 No water supply system is complete without an adequate distribution capability. Therein lies  
219 the major problem with the city's existing water supply system. The distribution system consists  
220 of mains which vary in size from six inches down to one and one-half inches - or less. Many of  
221 these lines are more than fifty years old. A computer-aided hydraulic analysis of the  
222 distribution system was conducted in 1988 and areas of reduced flow and pressure identified.  
223 The results of that study facilitated planning for replacement of any defective line segments.  
224 Additionally, the hydraulic analysis provided information that can be used to identify areas  
225 with a fire protection deficiency.

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233 **V-3. CAPACITY VERSUS DEMAND**

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236 1. Sanitary Sewer facilities. The City of Lake Helen lacks the necessary fiscal capacity to  
237 establish a central sanitary sewer system. Nor is such a facility required at the present. The use  
238 of septic tanks and drainfields is an approved method for dispersal of effluent where the  
239 concentration of such facilities does not create an environmental problem.

240

241 The providing of a central sanitary sewer capability must be planned in conjunction with some  
242 other entity, whether a local government or a private enterprise. The County of Volusia  
243 currently provides central sanitary sewer services to parts of the unincorporated county  
244 area near to, but not adjacent to, the city. A private utility that provides central sanitary

245 sewer services to areas near the city but not adjacent to the city. The City of Deland provides  
246 central sanitary sewer to development adjacent to the city. The city should initiate discussions  
247 with the entities to ascertain their plans for expansion into the areas which are adjacent to the  
248 City of Lake Helen.  
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251 2. Solid waste facilities. Solid waste is handled by a franchised hauler which is monitored  
252 and approved for the area by the County of Volusia. All collected solid waste is transported to  
253 the Volusia County landfill located on Tomoka Farms Road for disposal. There is no  
254 proportional capacity of the county landfill that is allocated to a particular local government.  
255 Rather the historical data as to quantity of solid waste and population estimate for the county  
256 as a whole is used by the county to determine a county-wide level of service standard. It  
257 follows that those communities with a large industrial or commercial demand upon the landfill  
258 would have a higher level of service standard than a city which is essentially residential. The  
259 county-wide level of service standard has been established at 8.6 pounds per capita per day  
260 while the City of Lake Helen uses a level of service standard of 6.6 pounds per capita per day.  
261 The latter figure agrees with that which was provided by Volusia County for the unincorporated  
262 part of the county and is considered to be valid for the city.  
263

264 The Volusia County Comprehensive Land Use Plan uses data that was prepared by a consulting  
265 firm to determine landfill capacity and is the only information contained in the Volusia County  
266 Comprehensive Land Use Plan pertaining to landfill capacity. That data indicates that the  
267 existing landfill has an anticipated capacity of some 29 million cubic yards. The City of Lake  
268 Helen as assurance that the county landfill will be able to dispose of all solid waste generated  
269 within the city through the planning period.  
270

271  
272 The general performance of the existing municipal potable water supply system is good.  
273 Granted, there are some problems. But these problems have been addressed and the  
274 deficiencies are being corrected. The distribution system has been upgraded so as to provide  
275 an adequate flow pressure to meet all needs - including peak hour demands with a reserve for  
276 firefighting purposes. The difficulty within the pumping systems has been eliminated.  
277 Generally, the water system, with proper routine maintenance, should last through 2035.  
278 The location of the existing waterwells do not impact upon the natural resources of the area.  
279 One waterwell is located in a park area and no facilities are located within its cone of influence.  
280 A second waterwell is located in a very sparsely developed area of the city. The third waterwell  
281 is located in an area that is rural. However, the site of the waterwell is sufficiently large to  
282 ensure that no development is within 220 feet of the waterwell. In sum, these waterwells do  
283 not create an impact upon the natural resources of the area.  
284

285 3. Drainage facilities. There are limited drainage facilities that exist within the city.  
286 Significantly, none of these structures were designed to perform that function which currently  
287 assigned to a drainage facility. The facilities located in Drainage Basin No. I consists of a long



288 series of interconnected catch basins which run along Lakeview Drive, past Ohio Avenue and  
289 through the old Nautilus complex. This system collects runoff from the nearby urbanized areas  
290 and dumps into Lake Macy. The system is old and cannot handle the normal flow resulting from  
291 a significant rainfall event. This results in over flow which crosses over the land area to the lake.  
292

293 Basin No. 5 contains two systems of interconnected catch basins, both of which drain  
294 residential areas directly into Lake Helen. The outlet of one system is partly submerged and  
295 there is a large mass of sediments and weeds in the area. The second system is also submerged  
296 and is located in a yard.  
297

298 The types of culverted drainage system used are typical of the "pre-stormwater Management"  
299 designs which were intended to convey runoff, deter localized flooding, and eliminate erosion.  
300 They do not remove or reduce pollutants present in the stormwater and increase the peak  
301 discharge rate into the lakes. By contrast, present day stormwater treatment systems such as  
302 grassed swales or retention/detention basins or other methods can be very efficient in  
303 removing pollutants from stormwater and maintaining the pre-development peak discharge  
304 rate and volume from a watershed.  
305

306 Given the condition and type of drainage facilities discussed above it is obvious that the existing  
307 facilities do not function as drainage systems. While it is true that these facilities do convey  
308 stormwater runoff they do not remove the pollutants. To be able to function as a drainage  
309 system requires major retrofitting of these partial systems. But such a retrofit program is not  
310 economically feasible.  
311

312  
313 4. Potable water facilities: The City of Lake Helen provides potable water to all city  
314 residents and to some customers in the community of Cassadaga. The geographic service area  
315 is the City of Lake Helen plus part of Cassadaga. The predominant usage is for household  
316 purposes. The present design capacity of the system is 1, 500,000 gallons per day  
317 The level of service is 98 gallons per day per capita.  
318

#### 319 A. Existing Facilities Capacity Analysis 320

321  
322 General performance of the water system is good; however, improvements are needed in  
323 distribution in some areas. To continue operating at the level of service, the system must  
324 continue to provide a minimum of twenty-five (25) pounds per square inch as well as ninety-  
325 eight (98) gallons per capita per day. The land use element proposes that the city will continue  
326 with its existing patterns of residential land use and projected population is expected to decline  
327 over the short term and long term planning time frame. Thus, no increase in needs are  
328 expected.  
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**B. Sanitary Sewer**

Given that the City of Lake Helen does not have a sanitary sewer system that facility's performance cannot be evaluated. But the sanitary sewer function is being performed by use of septic tanks and drainfields - and one packaged treatment plant located at the Mobile Home Villa - and these can be evaluated.

The Volusia County Health Department regulates and approves septic systems within the City. A percolation test and studies of the soil are used to determine size, siting and type of individual systems. There are no reports available on current demand (i.e. amount of sewage generated) by septic tank users.

The normal life expectancy of such a system would indicate that current development will not create any hazard to the health and welfare of the residents of the community. To date there have been no reports of endangerment to the natural resources of the area.

**C. Solid Waste**

The City of Lake Helen has opted to franchise the collection and transfer of its solid waste. Solid waste franchisees are approved and monitored by Volusia County. The franchisee collects and transfers the solid waste to the landfill site which is operated by Volusia County.

**D. Drainage**

The City of Lake Helen has adopted land development regulations such that standards within the city exceed that established by state, regional planning council, water management district and Volusia County. Significantly, storm water runoff measures now require retention of the first inch of rainfall as contrasted to the common standard of one-half inch. The only exceptions are for impervious surfaces of less than 1,000 square feet and land areas of less than 5,000 square feet.

**V-5 ANALYSIS OF PROBLEMS AND OPPORTUNITIES**

**A Sanitary Sewer**

The installation of a central sanitary sewer facility for the city is beyond the fiscal resources of the city. The low density development within the City is within State guidelines and does not appear to have any negative impact on the natural resources. The City may want to coordinate with the City of Deland regarding the feasibility of providing central wastewater should the need arise.

**B. Solid Waste**

377 Given the present franchise arrangement for handling solid waste the City of Lake Helen cannot  
378 see any advantage to creating a municipal solid waste collection and transfer capability. The  
379 landfill operation must remain with the county.

380

381 C. Drainage

382 The City does not have the financial capacity to retrofit the existing drainage facilities; however,  
383 the city has adopted stormwater management standards that apply to all new development  
384 within the city. These standards are stricter than state standards and require development to  
385 retain the 1<sup>st</sup> inch of runoff.

386

387 D. Potable Water

388 The existing potable water system is adequate to support the current demand and projected  
389 demand throughout the short term and long term planning period. The city has been replacing  
390 those lines in the delivery system which were inadequate and will continue to do so.

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393 **V-6. ANALYSIS OF MAJOR NATURAL DRAINAGE FEATURES AND NATURAL**  
394 **GROUNDWATER AQUIFER RECHARGE AREAS**

395 There are no streams or rivers within the City of Lake Helen. Lakes and wetlands are depicted  
396 at Map 6-2 of this plan. There are no areas within the city that have been designated by the  
397 regional water management district as prime groundwater recharge areas (Map 5-2). The low  
398 density development within the City is within State guidelines and does not appear to have any  
399 negative impact on the surficial or Floridian aquifer resources.

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