An Inventory of Public Water Supply Wells Owned and Operated by Orange County, Florida

Michael J. Henry
University of Central Florida

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AN INVENTORY OF PUBLIC WATER SUPPLY WELLS
OWNED AND OPERATED BY ORANGE COUNTY, FLORIDA

BY

MICHAEL J. HENRY
B.A.E., Auburn University, 1965

RESEARCH REPORT

Submitted in partial fulfillment of the requirements
for the degree of Master of Science
in the Graduate Studies Program of the College of Engineering
University of Central Florida
Orlando, Florida

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1981
ABSTRACT

Orange County, Florida, through its Sewer and Water Department, owns fifty active and ten inactive water treatment plants. These treatment plants have a total of ninety-four supply wells, sixty-four of which are actually in service. Most of these wells were obtained through purchase from private or investor owned utility companies.

A file search was undertaken from records of the Orange County Sewer and Water Department, U.S. Geological Survey, former water system owners, and well drillers in order to compile all available information on these wells. Information was gathered on location, original drilling of the well, static water level and pumping tests, chemical and bacteriological quality of the water, and most recent pump, motor and auxiliary engine. This information was recorded on a data form for each well, with the wells geographically categorized into five areas throughout the County. For each geographical area, mean, high and low values were determined for well and casing depth; static water level; well flow, specific pumping capacity and other flow type parameters; and various water quality parameters, such as total dissolved solids, chloride, sulfide, iron, alkalinity, and hardness
concentrations. These were then compared to each other to see if any patterns could be established for wells in various areas of the County. Comparisons were also made to recorded piezometric surface levels of the Floridan Aquifer and to information in available literature on wells in the Orange County area.

The comparisons indicated wells were slightly shallower in the western part of the County than in the eastern part. Depth to static water level generally increased as you progressed from east to west, with the highest MSL elevations occurring in the southwest. Specific well capacity was greatest in the westerly area. Total dissolved solids content of the wells was much higher than that predicted by the literature, and hardness, iron and sulfide values were higher in the east than in the west.
ACKNOWLEDGEMENTS

I would like to thank my faculty advisor during preparation of this report, Dr. J. Paul Hartman, for his technical guidance and particularly for his patience and the motivation he provided when it appeared my motivation was somewhat lacking.

Many thanks go to Jim Robards, Joe Puryea, and Bob Stewart of the Orange County Sewer and Water Department for their help throughout the gathering of data phase. Also, thanks go to the many well drillers and private utility companies in the Central Florida area for their assistance in obtaining data which was not readily available.

Finally, special appreciation and thanks is extended to my wife, Betty, for tolerating me during the more trying times throughout my Master's Program and particularly for the hours spent in preparation of this report in lieu of being able to spend my time with her.
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CHAPTER I
INTRODUCTION

Public water supplies in the Central Florida area are generally from deep wells, rather than from surface water or shallow groundwater aquifers. This is particularly true for Orange County and the various water utility systems within.

Orange County contains many separate public water systems ranging in size from reasonably large (serving a population of approximately 220,000) to very small (serving populations of less than 100). In the past, there was an extensive number of small systems owned by private or investor utility companies. In recent years, the Orange County government has acquired most of these private systems, thereby reducing the total number of public water system owners in the County. At present, in addition to the Orange County government, there are systems owned by the Orlando Utilities Commission (serving the City of Orlando and surrounding areas), General Waterworks Corporation (serving the City of Winter Park and surrounding areas), the cities of Maitland, Apopka, Ocoee and Winter Garden, Reedy Creek Utilities (serving the Walt Disney World area), and a few small private companies. This research report is limited to a study of only the wells owned by the Orange County government.
As most all the wells in the County's systems were acquired from others, and not drilled under their directorship, any information on these wells which the County had in their files had been passed along from the prior owner with the sale of the individual water system. This information was limited, at best, and scattered throughout various files in the offices of the Orange County Sewer and Water Department. The primary purpose of this research report is to compile all information available on each well owned by the County and to record it in a convenient format so that easy access to data from all the wells can be obtained by referring to one source. A secondary purpose is to take the data collected and make comparisons to determine if significant relationships or differences exist between wells drilled throughout the County.

In addition to the employees and the files of the Orange County Sewer and Water Department, information was collected from various well drillers (Central Florida Well Drillers, Inc., 1979; Herron Well Drilling, 1979; Layne Atlantic Company, 1979; Locke Well and Pump Company, 1979; and Meridith Corporation, 1979); various former water system owners (Central Florida Utilities, 1979; General Waterworks Corporation, 1979; Meridith Corporation, 1979; and Southern States Utilities, Inc., 1979); and the United States Geological Survey, Orlando, Florida office. The files of each of these organizations were researched extensively to add to the amount of data already collected for each of the wells owned
by the County. The accuracy of the data shown in succeeding chapters of this report is limited to the accuracy of data in the files researched. The writer disclaims responsibility for any of the data which may be found to be in error through additional research or physical testing. In several instances, conflicting data was collected from different sources for a particular well. In cases where the correct information could not be readily determined, the data from both sources is shown on the data sheet and a reference to the conflict is made.

It is expected that this research report will be most useful to the Orange County Sewer and Water Department. They will have one source to refer to when requiring information on any of their wells, whether it be physical or chemical in nature. It will be helpful to them when problems arise with the wells or well pumps, in that immediate reference will be available to those troubleshooting the problems. In addition, the County or others interested in drilling a well in the general proximity of wells shown in this report can use these data to project the quantity and quality of water available and the physical characteristics of a well necessary to acquire it.
CHAPTER II
HYDROLOGY IN THE ORANGE COUNTY AREA

Orange County is underlain mostly by marine limestone, dolomite, shale, sand, and anhydrite to about 6500 feet, at which depth granite and crystalline rock of the basement complex occur (Lichtler, et al., 1968). Ground water is obtained from three levels within this range. These are: (1) a non-artesian aquifer composed of clastic material of late Miocene to recent age, (2) several discontinuous shallow artesian aquifers in the Hawthorn Formation of Middle Miocene Age, and (3) the Floridan Aquifer composed of the Ocala Group, the Avon Park Limestone, the Lake City Limestone, the Suwannee Limestone, and the Tampa Limestone, all of Eocene Age, and permeable parts of the Hawthorn Formation that are in hydrologic contact with the rest of the aquifer (Lichtler, et al., 1964).

Non-artesian conditions occur when the upper surface of the zone of saturation (the water table) is not confined and accordingly is free to rise and fall. Artesian conditions occur when an aquifer (water bearing formation) is confined by relatively impermeable beds and the water is under greater than atmospheric pressure.
The heights to which water will rise in tightly cased wells that penetrate an artesian aquifer define its pressure or piezometric surface. The piezometric surface is not directly related to the water table and may be above, below, or at the same level as the water table. Where the water table is above the piezometric surface, the non-artesian water may infiltrate through the confining layer to the artesian aquifer. Such areas are recharge areas to the artesian aquifer. Conversely, where the piezometric surface is above the water table, the artesian water moves upward and the area is a discharge area of the artesian aquifer. As no confining bed is completely impermeable, some leakage up or down usually occurs; however, where the confining bed is composed of a thick section of dense material, such as clay, the amount of leakage is relatively small.

The non-artesian aquifer in Orange County extends from the water table to about 30 or 40 feet below land surface. It is composed mainly of quartz sand with varying amounts of clay, hardpan, and shell material. The non-artesian aquifer extends over most of the County, but its composition and thickness, and consequently its productivity, vary and there may be many local areas where it will not produce enough water to supply a well. Most wells in the non-artesian aquifer are small diameter sand-point or screened wells, 20 to 30 feet deep, that yield small to moderate quantities of water. Practically all the recharge
to this aquifer comes from rainfall within or near the County. Discharge from the aquifer is by evapotranspiration, seepage into surface water bodies, downward leakage to underlying aquifers, seepage out of the County, and pumpage.

Several shallow artesian aquifers occur within the confining beds of the Hawthorn or younger formations at depths ranging from about 60 feet to more than 150 feet below land surface. These aquifers are composed of discontinuous shell beds, thin limestone layers, or permeable sand zones. The shallow artesian aquifers are most productive in the area east and south of Orlando, where they yield quantities of water sufficient for domestic use to screened or open-end wells. Recharge to these aquifers is mostly by leakage through overlying beds or by upward leakage from underlying beds where the piezometric surface of the Floridan Aquifer is above the piezometric surface in the shallow artesian aquifer. A small amount of water probably flows into the County from surrounding counties within the shallow artesian aquifers. Discharge from these aquifers is by downward leakage to the Floridan Aquifer, upward leakage to the non-artesian aquifer where the piezometric surface is above the water table, underground flow out of the County, and pumpage (Lichtler, et al., 1964).

The Floridan Aquifer, consisting of nearly 2000 feet of porous limestone and dolomite or dolomitic limestone covered
by sand and clayey sand ranging in thickness from a few feet to about 350 feet, is one of the most productive aquifers in the world. The total thickness of the Aquifer is not accurately known because the deepest water well in the County penetrates only the upper 1400 feet. The log of an oil test well drilled southeast of Orlando shows dense anhydrite at about 2000 feet, and this is assumed to be the base of the Aquifer.

The Floridan Aquifer in Orange County has two major producing zones that are separated by a relatively impermeable zone. The upper producing zone extends from about 150 feet below the land surface to about 600 feet. The lower producing zone extends from about 1100 feet to 1500 feet or more below the land surface. Both major producing zones are composed of hard brown dolomitic limestone or dolomite and relatively soft cream limestone; however, the top half of the upper zone is mostly soft limestone. Some of the dolomite in both major producing zones is very dense, but many interconnecting solution channels make the overall permeability of both zones very high (Lichtler, et al., 1968).

Solution channels, ranging in diameter from a fraction of an inch to many feet, probably occur throughout the Aquifer, but are most prevalent at depths between 200 and 600 feet and between 1100 and 1500 feet below the land surface. Cavities 15 feet or more in depth have been reported by drillers. Tests made by Unklesbay in 1943 show that wells with open holes between
depths of 60 and 450 feet and wells with open holes between 550 and 1000 feet below land surface have the same water level and fluctuate together, indicating that the solution channels are interconnected vertically as well as horizontally (Lichtler, et al., 1964).

The soft cream limestone in the top half of the upper zone contains solution channels, but they are usually neither as large nor as numerous as the channels in the dolomitic parts of either producing zone. At some locations, very large (4000 GPM or more) yields can be obtained from the soft limestone, but most high yield wells also penetrate the underlying dolomitic limestone. However, many domestic wells and small public supply wells draw their water from the soft limestone section of the upper zone. The municipal supplies for the cities of Orlando and Winter Park are developed in the lower producing zone of the Aquifer (1100-1500 feet). These wells generally yield 3-5,000 GPM with 10 to 25 feet drawdown (Lichtler, et al., 1968). Most other public supplies in Orange County are developed in the upper producing zone of the Floridan Aquifer.

The relatively impermeable zone (600-1100 feet) separating the two major producing zones is composed of relatively soft, mealy limestone and dolomitic limestone. It contains some water bearing layers, but generally this separating zone yields much less water than the zones above and below it. In many
parts of the County the separating zone would be considered a good aquifer, but because much larger supplies can be obtained above and below, very few wells are developed in it (Lichtler, et al., 1968).

The piezometric surface of the Floridan Aquifer in Orange County ranges from about 15 feet above to more than 60 feet below the land surface and slopes to the east and northeast from its highest point in the southwestern part of the County. The magnitude of fluctuations of the piezometric surface ranges from place to place in the County. The greatest fluctuations occur in Orlando, where more than 300 drainage wells in and around the City permit direct and immediate recharge to the Aquifer and where pumping is concentrated (Lichtler, et al., 1964).

The most effective recharge areas in the East Central Florida region are in Lake County and in the western part of Orange, Seminole and Volusia Counties. An isolated recharge area, which appears to be an extension of the Volusia County area, is in Eastern Seminole County (Lichtler, 1972). Most of the recharge to the Floridan Aquifer in Orange County is from infiltration of rain through the relatively thin semipermeable confining beds in the highlands section of the County and through drainage wells. A lesser quantity enters the County by underground flow from southern Lake County and from Osceola County (Lichtler, et al., 1964). The drainage wells have been installed
to convey surface water directly to the upper zone of the Aquifer. This is useful in providing recharge and maintaining ground water levels. However, there are very few controls on the quality of the water entering the Aquifer through these wells, and wide-spread pollution of the upper zone has resulted. Fortunately, the lower zone has not yet been polluted (Lichtler, 1972).

The quality of the water in the Floridan Aquifer ranges greatly throughout the County, but varies little at a particular location and depth. In the western part of the County, most of the water in the Aquifer is relatively low in mineral content, and the dissolved solids are less than 150 mg/l. The mineral content of the water increases toward the eastern part of the County, and the dissolved solids exceed 1000 mg/l in the flowing wells along the St. Johns River. The high mineral content of artesian water in the eastern part of the County is probably due to incomplete flushing of saline water that entered the Aquifer when the sea last covered Florida.

Lichtler states that except for high hardness, most water from the Floridan Aquifer in western and central Orange County is of good chemical quality. However, water from flowing wells to the east along the St. Johns River is very hard and contains large amounts of sodium, sulfate, and chloride (Lichtler, et al., 1964).

Hydrogen sulfide gas is generally present in water from flowing wells, and can be detected by the characteristic odor
and taste similar to rotten eggs. This gas has two possible sources in natural water. One is the reduction of sulfates by organic material under anaerobic conditions, resulting in the decomposition of metallic sulfide by free carbon dioxide. In some cases, hydrogen sulfide may be formed from the anaerobic reduction of organic matter with which the water comes in contact. The concentration of hydrogen sulfide in deep well water is highly variable, ranging from traces to over 4 mg/l. It may be eliminated by aeration (Lichtler, et al., 1968).

Succeeding chapters of this report show actual data from existing wells in Orange County. This data can be compared to the information from the literature that was researched to develop this chapter on hydrology.
CHAPTER III

ORANGE COUNTY POTABLE WATER SYSTEM

Development of the Water System

Orange County has been in the sewer business since 1958. It was not until 1972, however, that the County entered the water business. On February 8, 1972, the Orange County Commission created a Sewer and Water Advisory Commission, whose responsibility was the development, operation, and maintenance of adequate sewer and water systems within the unincorporated areas of the County.

On July 18, 1972, the Orange County Commission passed a Resolution requiring that all persons desiring to construct or expand a water or sewer system within the unincorporated areas of the County make application to the newly named Orange County Sewer and Water Department. This Ordinance was expanded on May 1, 1973, to require newly constructed water and/or sewer systems to be deeded to the County for ownership, operation and maintenance.

Then, based on Chapter 153 of the Florida Statutes, giving County governments the authority to purchase private or investor-owned water and/or sewer systems, the County set up an Acquisitions Commission for the purpose of acquiring private utilities serving the unincorporated areas of Orange County.
In July, 1973, a Water Treatment Superintendent was hired by the County to prepare for the acquisition of new water systems. The first system was obtained from Locke Well and Pump Company in January, 1974. This system was known as East Highlands and was located near East Colonial Drive and Chickasaw Trail. At that time, there were three employees in the Water Section.

It was not until late 1974 and early 1975 that the County acquired additional systems. At this time, they purchased the Vistana and Orangewood systems and increased the water section to five employees. Through the balance of 1975, the County's acquisitions flourished. Several individually owned water systems as well as the unincorporated Orange County properties of investor owned Southern Gulf Utilities and General Waterworks Corporation were acquired. By the end of 1975, the Water Section had twelve employees.

In 1976, another investor owned utility, Southern States Utilities, sold most all of their unincorporated Orange County properties to the County. In addition, two or three other small systems were acquired.

In 1977, the County bought the Orange County properties of First Florida Utilities and Central Florida Utilities, both of which owned numerous systems. By the close of 1977, there were twenty-nine employees in the Section.
At the present time, with the County owning fifty operational water plants, they are dormant in acquiring additional systems. There are some that are possible acquisitions in the future, but very few are probable. The operational structure is set up for thirty-five employees, although only thirty-two positions are actually filled. As the majority of the systems in unincorporated Orange County have been purchased, the present trend is to tie neighboring small systems together to form larger, more efficient systems.

Wells in the System

The Orange County water system is comprised of fifty active water treatment plants having sixty-four wells presently in service. In addition, there are another ten water treatment plants which have been phased out of service due to having their distribution systems interconnected with one or more other distribution systems which are serviced by active water treatment plants. The underlying reasons for interconnecting distribution systems and phasing out water plants are: less than acceptable water quality or unsatisfactory bacteriological samples from the wells; old, un-reliable equipment in service; and inadequate size or incompatibility with the pumping procedures used at a larger interconnected plant. There are at least thirty out-of-service wells located at the fifty active and ten inactive treatment plants.
Some references indicate other, older, wells existed at some of the plants, but no records of any data have been passed along to recent owners. Only the ninety-four wells having recorded data available are included in this report.

The water treatment plants are dispersed throughout unincorporated Orange County, generally encircling the urban area of the cities of Orlando, Winter Park and Maitland. The numbering system applied by the County to the various active plants is alphabetical in design. Both the active and inactive treatment plants are listed in Table III-1, and their locations are shown in Figure III-1. Also shown in Figure III-1 are present and former locations for official rainfall measuring points for the Orlando area. The former location, Herndon Airport, is labeled R1 and the present location, McCoy Jetport, is labeled R2.

The water plants have been geographically divided into five general areas for discussion and comparison in later sections of this report. These geographical areas are also shown in Figure III-1 and are labeled East, Southeast, West, Southwest and Far Northwest. A listing by geographical area is shown in Table III-2.

Data on each of the wells was compiled on a five-page form shown here as Table III-3. In very few cases was all desired data available for a given well. The form was designed, however, to log any information considered by the writer to be useful to Orange County or their consultants. Data was gathered on location;
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Fig. II-1 Location Map, Orange County Water Treatment Plants, With Area Designation
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<td>Lee Estates</td>
</tr>
<tr>
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<td>Bonneville</td>
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</tr>
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<td>Corrine Terrace</td>
<td>42</td>
<td>Tiffany Terrace</td>
</tr>
<tr>
<td>13</td>
<td>East Dale Acres</td>
<td>43</td>
<td>University Park</td>
</tr>
<tr>
<td>14</td>
<td>East Highlands</td>
<td></td>
<td>INAC College Heights</td>
</tr>
<tr>
<td>17</td>
<td>High Point</td>
<td>3</td>
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</tr>
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<td></td>
<td>7</td>
<td>Conway</td>
</tr>
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</tr>
<tr>
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<td></td>
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<td>Conway West</td>
</tr>
<tr>
<td></td>
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<td>15</td>
<td>Graham Gardens</td>
</tr>
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<td>36</td>
<td>Rio Pinar</td>
</tr>
<tr>
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<tr>
<td><strong>SOUTHWEST AREA</strong></td>
<td></td>
<td><strong>WEST AREA</strong></td>
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</tr>
<tr>
<td>12</td>
<td>Down Point</td>
<td>45</td>
<td>Vistana</td>
</tr>
<tr>
<td>16</td>
<td>Hidden Springs-Marsha Park</td>
<td>46</td>
<td>Wauseon Ridge</td>
</tr>
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<td>19</td>
<td>Kelso-on-Lake Butler</td>
<td>48</td>
<td>Windermere</td>
</tr>
<tr>
<td>20</td>
<td>Lake Down</td>
<td>49</td>
<td>Windermere Downs</td>
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<td>28</td>
<td>Orangewood</td>
<td></td>
<td>INAC Lake Cane</td>
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<td><strong>FAR NORTHWEST AREA</strong></td>
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<tr>
<td>26</td>
<td>Mount Plymouth Lakes</td>
<td>33</td>
<td>Plymouth Hills</td>
</tr>
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<td>31</td>
<td>Plymouth</td>
<td>39</td>
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</tr>
<tr>
<td>32</td>
<td>Plymouth Heights</td>
<td>47</td>
<td>Wekiva Manor</td>
</tr>
</tbody>
</table>
TABLE III-3
WELL DATA COLLECTION FORM
Orange County Well

Well (Plant) Name:
Well Number:
Location:
Date Drilled:
Drilled by:
Type of drilling: (a) rotary (b) Cable-tool (c) Other:

Total Depth: _____ ft.  Ground Elevation: ________
Drill hole diameter: Size _____ in.  From _____ ft. to _____ ft.

_____ in.  _____ ft.  _____ ft.

Casing Record:

<table>
<thead>
<tr>
<th>Size</th>
<th>From depth to depth</th>
<th>Type</th>
<th>Material</th>
<th>Wall Thickness</th>
<th>Wt/Ft</th>
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<tr>
<td>_____</td>
<td>_____ ft to _____ ft</td>
<td>____</td>
<td>______</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>____</td>
<td>_____</td>
<td>______</td>
<td>____</td>
<td>____</td>
<td></td>
</tr>
<tr>
<td>____</td>
<td>_____</td>
<td>______</td>
<td>____</td>
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</tr>
<tr>
<td>____</td>
<td>_____</td>
<td>______</td>
<td>____</td>
<td>____</td>
<td></td>
</tr>
</tbody>
</table>

Well Screen: Made by: Size: ______ in.  Material: ______

From: _____ ft. to _____ ft.

Grouting: ( ) yes ( ) no  Type: __________________

From: _____ ft. to _____ ft

_____  _____
Static Water Level: __________ Date: __________

Gravel packed with: __________ of size: __________

Type of Gravel Pack: _______________________________

<table>
<thead>
<tr>
<th>Well Yield</th>
<th>Drawdown</th>
<th>Specific Capacity</th>
<th>Date</th>
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<tr>
<td>(gpm)</td>
<td>(ft)</td>
<td>(gpm/ft. drawdown)</td>
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<tr>
<td>__________</td>
<td>________</td>
<td>_________________</td>
<td>______</td>
</tr>
<tr>
<td>__________</td>
<td>________</td>
<td>_________________</td>
<td>______</td>
</tr>
<tr>
<td>__________</td>
<td>________</td>
<td>_________________</td>
<td>______</td>
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<tr>
<td>__________</td>
<td>________</td>
<td>_________________</td>
<td>______</td>
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</table>

Well ownership history: Well Usage:
## 21
### WELL LOG

<table>
<thead>
<tr>
<th>From Feet</th>
<th>To Feet</th>
<th>Type Material Encountered</th>
<th>Remarks</th>
<th>Indicate Water Bearing Zones</th>
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</thead>
</table>

Bacteriological History:  

Date:

### Chemical Analysis:

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<th>Component</th>
<th>PPM</th>
<th>Component</th>
<th>PPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dissolved solids</td>
<td></td>
<td>Total hardness (CaCO₃)</td>
<td></td>
</tr>
<tr>
<td>Total alkalinity (CaCO₃)</td>
<td></td>
<td>Calcium hardness (CaCO₃)</td>
<td></td>
</tr>
<tr>
<td>Carb. Alk. (CaCO₃)</td>
<td></td>
<td>Magnesium hardness (CaCO₃)</td>
<td></td>
</tr>
<tr>
<td>BiCarb. Alk. (CaCO₃)</td>
<td></td>
<td>Calcium (Ca)</td>
<td></td>
</tr>
<tr>
<td>Carbonate (CO₃)</td>
<td></td>
<td>Magnesium (Mg)</td>
<td></td>
</tr>
<tr>
<td>Bicarbonate (HCO₃)</td>
<td></td>
<td>Sodium (Na)</td>
<td></td>
</tr>
<tr>
<td>CO₂</td>
<td></td>
<td>Iron (Fe)</td>
<td></td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td></td>
<td>Manganese (Mn)</td>
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</tr>
<tr>
<td>Sulfate (SO₄)</td>
<td></td>
<td>Copper (Cu)</td>
<td></td>
</tr>
<tr>
<td>Fluoride (F)</td>
<td></td>
<td>Silica (SiO₂)</td>
<td></td>
</tr>
<tr>
<td>Phosphate (PO₄)</td>
<td></td>
<td>Color PCU</td>
<td></td>
</tr>
<tr>
<td>pH (lab)</td>
<td></td>
<td>Odor threshold</td>
<td></td>
</tr>
<tr>
<td>pHs</td>
<td></td>
<td>Turbidity NTU</td>
<td></td>
</tr>
<tr>
<td>Stability index</td>
<td></td>
<td>Sulfide (field fixed)</td>
<td></td>
</tr>
<tr>
<td>Saturation index</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WELL PUMP

Test Pump Data:

Pumped_________ Bailed_________ Estimated_________

Date tested____ Test Yield_______ GPM after __hrs of pumping

Test pump rated________ GPM ___________ HP

Permanent Pump Data:

Date Installed:_________ Installed by:_________

Motor: Manufacturer:__________________________

Horsepower__________ Serial #______________

Type_________ RPM_________ Model____________

Phase_________ Volts_________ Amps____ Eff.____

Starter____________ Type of Bearings_________

Pump: Manufacturer:__________________________

Model____________ Size____________

Type_________ # of stages_______ Serial #_____ 

RPM_________ Capacity_________ GPM @____TDH

Base plate elevation_________ efficiency______

Check Valve_________ Gate Valve______________

Suction size_________ Discharge size__________

Average hours pumped per day_________________

Bowl: Manufacturer:__________________________

Type________________ Model________________

No. of bowls_______ Size____________

Bowl material________________
Setting at: Top________ ft  
Bottom________ ft  
Measured from________

Column: length________ diameter________

Motor controls: Manufacturer:__________________________

Auxiliary engine: Manufacturer:__________________________

Model No.________ Serial No.________

Horsepower________ RPM________

Efficiency__________________________

Type__________________________
original drilling of the well (date, driller, depth, casing, well screen, grouting, well log, etc.); static water level and pumping tests; chemical and bacteriological quality of the water; and most recent, if not present, pump, motor and auxiliary engine.

Some of the data collected, such as chemical analyses and well logs, was considered too voluminous to include in this report. If desired, however, it is available from the Orange County Sewer and Water Department or from the writer.

Data on static water level was compared to piezometric surface level maps obtained from the U.S. Geological Survey to check for accuracy and to Orlando rainfall records to ascertain if a correlation exists.

The next several chapters of this report discuss the data compiled and provide comparisons and similarities between wells in the various geographical areas.
CHAPTER IV
EAST AREA WELLS

Orange County owns, operates and maintains thirteen water treatment plants in the East Area, twelve of which are active. This area is bounded roughly on the north by University Boulevard, on the east by Percival Road, on the south by Lake Underhill Road, and on the west by Semoran Boulevard. At these thirteen plants, there are fifteen wells in service and five wells which are no longer in service. The treatment plants are listed in Table IV-1 and their locations are shown in Figure IV-1.

Table IV-2 gives elevation and depth data for the wells themselves, the casing pipe in each well and the static water level recorded in each well. Some data, as mentioned in Chapter I, was gathered from several references and is conflicting in nature. Some of the static water level data was recorded on more than one date for a given well. As is representative of all tables in this and succeeding chapters of this report, conflicting data or duplicated data is noted.

All of the well depths fall into the upper level of the Floridan Aquifer, with the deepest being 570 feet, the shallowest 180 feet, and the mean 373 feet from ground surface. Casing pipe depths, which represent the depth at which solid rock or an
### TABLE IV-1
ORANGE COUNTY WELLS LOCATED IN EAST AREA

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Plant Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Arbor Ridge</td>
</tr>
<tr>
<td>2</td>
<td>Arcadia Acres (formerly Evergreen Terrace)</td>
</tr>
<tr>
<td>4</td>
<td>Bonneville</td>
</tr>
<tr>
<td>10</td>
<td>Corrine Terrace</td>
</tr>
<tr>
<td>13</td>
<td>East Dale Acres</td>
</tr>
<tr>
<td>14</td>
<td>East Highlands</td>
</tr>
<tr>
<td>17</td>
<td>High Point</td>
</tr>
<tr>
<td>18</td>
<td>Hilltop Manor</td>
</tr>
<tr>
<td>23</td>
<td>Lee Estates</td>
</tr>
<tr>
<td>29</td>
<td>Orlando Acres (formerly Royal Estates)</td>
</tr>
<tr>
<td>42</td>
<td>Tiffany Terrace</td>
</tr>
<tr>
<td>43</td>
<td>University Park</td>
</tr>
<tr>
<td>Inactive</td>
<td>College Heights</td>
</tr>
</tbody>
</table>
Fig. IV-1. Location map for east area wells.
### TABLE IV-2

**EAST AREA WELLS - ELEVATION/DEPTH DATA**

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Grnd Elev. ft., MSL</th>
<th>Well Depth (ft)</th>
<th>Casing Depth (ft)</th>
<th>Static Water Level (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>60</td>
<td>411</td>
<td>99</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>64</td>
<td>210</td>
<td>60</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>60</td>
<td>553</td>
<td>197</td>
<td>28/22**</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>95</td>
<td>475</td>
<td>225</td>
<td>35</td>
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<tr>
<td>10</td>
<td>2</td>
<td>95</td>
<td>570</td>
<td>215</td>
<td>46</td>
</tr>
<tr>
<td>13</td>
<td>-</td>
<td>72</td>
<td>370</td>
<td>221/196**</td>
<td>17</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>78</td>
<td>325</td>
<td>179</td>
<td>19</td>
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<tr>
<td>17</td>
<td>1</td>
<td>72</td>
<td>423</td>
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<td>126</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>-</td>
<td>62</td>
<td>292</td>
<td>210</td>
<td>25/19*</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>71</td>
<td>350</td>
<td>163</td>
<td>24</td>
</tr>
<tr>
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<td>87</td>
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<td>35</td>
</tr>
<tr>
<td>42</td>
<td>2</td>
<td>87</td>
<td>400</td>
<td>110</td>
<td>--</td>
</tr>
<tr>
<td>43</td>
<td>-</td>
<td>53</td>
<td>493/423**</td>
<td>177</td>
<td>10</td>
</tr>
<tr>
<td>College</td>
<td>1</td>
<td>55</td>
<td>465</td>
<td>238</td>
<td>16</td>
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<tr>
<td>Heights</td>
<td>2</td>
<td>55</td>
<td>449</td>
<td>240</td>
<td>9</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>373</td>
<td>161</td>
<td>23</td>
</tr>
<tr>
<td>Deepest</td>
<td></td>
<td></td>
<td>570</td>
<td>240</td>
<td>46</td>
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<tr>
<td>Shallowest</td>
<td></td>
<td></td>
<td>180</td>
<td>60</td>
<td>9</td>
</tr>
</tbody>
</table>

* Readings taken on different dates
** Conflicting data from different references
aquiclude was reached casing out the ground water aquifer, range from 60 feet to 240 feet below ground surface, averaging 161 feet. Static water level depths range from 9 to 46 feet below ground surface, with the mean being 23 feet. These levels represent the artesian pressure of the water in the Floridan Aquifer at the particular well's location.

Comparing the static water level data collected to piezometric surface level maps from the U.S. Geological Survey (U.S.G.S.) indicated reasonable agreement for all but Well No. 2 at the inactive College Heights Water Plant. The recorded static water elevation of 46 feet MSL (measured September 23, 1975) appears to be approximately seven feet higher than that which would be predicted by the U.S.G.S. maps. It is noted that the U.S.G.S. maps showed variations of piezometric surface level elevations varying up to 25 feet over a seventeen year period for any particular well. As these elevations are so time dependent, very little significance can be given to the average static water level shown in Table IV-2.

Table IV-3 provides pumping data from the wells. The maximum known tested well flow is shown for each well, followed by its ratios to the well drawdown level (giving specific capacity), well circumference, and both drawdown and well circumference. Each of these ratios can be considered to represent the water bearing capacity of the aquifer at this location. A higher value of any of these ratios at one location over another could indicate more water may be obtained at that location than at the other one.
<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Max. Pumping Test Flow (gpm)</th>
<th>Specific Capacity (gpm/ft drawdown)</th>
<th>Flow per Unit Well Circumference (gpm/in circum.)</th>
<th>Specific Capacity per Unit Well Circumference (gpm/ft drawdown-in circum.)</th>
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<tr>
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<td>1,500</td>
<td>187.5</td>
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<td>2</td>
<td>-</td>
<td>150</td>
<td>-----</td>
<td>7.96</td>
<td>-</td>
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<tr>
<td>4</td>
<td>-</td>
<td>2,500</td>
<td>714.3</td>
<td>49.72</td>
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<td>38.20</td>
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<td>128.6</td>
<td>47.76</td>
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<tr>
<td>13</td>
<td>-</td>
<td>225/250*</td>
<td>-----</td>
<td>11.94/13.26*</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>100</td>
<td>-----</td>
<td>5.31</td>
<td>-</td>
</tr>
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<td>17</td>
<td>1</td>
<td>600</td>
<td>-----</td>
<td>23.88</td>
<td>-</td>
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<td>17</td>
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<td>600</td>
<td>-----</td>
<td>23.88</td>
<td>-</td>
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<td>18</td>
<td>1</td>
<td>35</td>
<td>-----</td>
<td>2.79/1.86*</td>
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<td>18</td>
<td>2</td>
<td>35</td>
<td>-----</td>
<td>2.79</td>
<td>-</td>
</tr>
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<td>32</td>
<td>8.49</td>
<td>1.69</td>
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<td>17.82/13.52*</td>
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<td>29</td>
<td>2</td>
<td>-</td>
<td>-----</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>29</td>
<td>3</td>
<td>50</td>
<td>-----</td>
<td>3.98</td>
<td>-</td>
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<td>100/150*</td>
<td>-----</td>
<td>5.31/7.96*</td>
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<td>25.48</td>
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<td>500</td>
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<td>-</td>
</tr>
<tr>
<td>College</td>
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<td>1,800</td>
<td>300</td>
<td>4.7/6</td>
<td>7.95</td>
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<td>53.04</td>
<td>3.30</td>
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<td>22.55</td>
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<td>2,500</td>
<td>714.3</td>
<td>53.04</td>
<td>14.20</td>
</tr>
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<td>32</td>
<td>1.86</td>
<td>1.69</td>
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</table>

*Conflicting Data from different references
Using the ratios having well circumference can be misleading, however. If two separate wells are both pumped to their limits, i.e., at volumetric rates approaching the maximum value for each well, the calculated ratios could be reasonably comparable. If, on the other hand, one of the wells is not pumped to its limit, a comparison to the other well would show a false relationship. For the data collected, there is no way to assure the volumetric flow rates tested were the maximum rates each well could produce. Therefore, the values shown for the two ratios reflecting the use of the circumference of each well cannot be used effectively. If new tests were run on these wells, allowing for maximum pumping rates to be determined, then the new ratios calculated could be useful in predicting the water bearing capacity of the formations.

Tested well flows in the east area ranged from a low of 35 gallons per minute to a high of 2500 GPM, with the mean being 768. For the wells with data available, specific capacity varied from 32.0 to 714.3 GPM per foot of drawdown, averaging 247.8. Flow per unit well circumference had a mean value of 22.55 GPM per inch, with a range of 1.86 to 53.04. Specific capacity per unit well circumference for the wells having data available ranged from 1.69 to 14.20 GPM per foot of drawdown per inch circumference, with a mean value of 5.92.

Table IV-4 compares concentrations of significant physical and chemical compounds recorded through chemical analysis of each
<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Total Dissolved Solids (mg/l)</th>
<th>Total Alkalinity CaCO₃ (mg/l)</th>
<th>Total Hardness CaCO₃ (mg/l)</th>
<th>Chloride Cl (mg/l)</th>
<th>Sulfide S (mg/l)</th>
<th>Iron Fe (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>192</td>
<td>126</td>
<td>126</td>
<td>3</td>
<td>2.7</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>267</td>
<td>186</td>
<td>183</td>
<td>3</td>
<td>0.7</td>
<td>&gt; 0.3</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>216</td>
<td>144</td>
<td>144</td>
<td>3</td>
<td>3.5</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>215</td>
<td>144</td>
<td>144</td>
<td>12</td>
<td>0.98</td>
<td>0.11</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>250</td>
<td>162</td>
<td>160</td>
<td>12</td>
<td>0.96</td>
<td>0.15</td>
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<tr>
<td>13</td>
<td>-</td>
<td>205</td>
<td>138</td>
<td>138</td>
<td>3</td>
<td>1.8</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>238</td>
<td>138</td>
<td>143</td>
<td>3</td>
<td>----</td>
<td>&gt; 0.1</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>325</td>
<td>228</td>
<td>228</td>
<td>3</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>260</td>
<td>170</td>
<td>168</td>
<td>3</td>
<td>1.7</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>331</td>
<td>222</td>
<td>234</td>
<td>3</td>
<td>----</td>
<td>0.3</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>23</td>
<td>-</td>
<td>310</td>
<td>216</td>
<td>222</td>
<td>3</td>
<td>----</td>
<td>1.8</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>193</td>
<td>126</td>
<td>126</td>
<td>3</td>
<td>3.5</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>29</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>29</td>
<td>3</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>42</td>
<td>1</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>42</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>43</td>
<td>-</td>
<td>200</td>
<td>126</td>
<td>126</td>
<td>6</td>
<td>3.5</td>
<td>0.1</td>
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<tr>
<td>College Hts</td>
<td>1</td>
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<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>College Hts</td>
<td>2</td>
<td>197</td>
<td>150</td>
<td>150</td>
<td>3</td>
<td>2.1</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>213</td>
<td>162</td>
<td>162</td>
<td>4</td>
<td>2.0</td>
<td>0.25</td>
</tr>
<tr>
<td>Highest</td>
<td></td>
<td>331</td>
<td>228</td>
<td>234</td>
<td>12</td>
<td>3.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Lowest</td>
<td></td>
<td>192</td>
<td>126</td>
<td>126</td>
<td>1</td>
<td>0.1</td>
<td>&lt; 0.1</td>
</tr>
</tbody>
</table>
well. Although, in general, complete public water supply analyses, as required by the State of Florida Department of Environmental Regulation, were found for these wells, only those parameters which are most representative of potable water quality in the Central Florida area and that vary significantly from well to well are listed. Due to the voluminous nature of the complete chemical analysis, this data is not included with the individual data sheet shown for each well later in this chapter, and for other wells in succeeding chapters.

Florida potable water standards for the components shown in Table IV-4 are as follows (State of Florida Department of Environmental Regulation, 1981):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dissolved Solids</td>
<td>500 mg/l maximum</td>
</tr>
<tr>
<td>Total Alkalinity</td>
<td>none established</td>
</tr>
<tr>
<td>Total Hardness</td>
<td>none established</td>
</tr>
<tr>
<td>Chloride</td>
<td>250 mg/l maximum</td>
</tr>
<tr>
<td>Sulfide</td>
<td>none established</td>
</tr>
<tr>
<td>Iron</td>
<td>0.3 mg/l maximum</td>
</tr>
</tbody>
</table>

In addition, the relative hardness of water, which is caused by the presence of alkaline earth metals such as calcium and magnesium (Lichtler, 1964) is generally defined as follows (Sawyer and McCarty, 1967):
Soft      0 - 75 mg/l as CaCO₃
Moderately Hard  75 - 150 mg/l as CaCO₃
Hard        150 - 300 mg/l as CaCO₃
Very Hard   more than 300 mg/l as CaCO₃

As can be seen from the table, all wells are within the established limits for total dissolved solids and chloride. All are within the hardness classifications of either moderately hard or hard. In general, hardness levels in the range found are not treated to reduce their values in the Orange County area. Iron levels are at or above the established limits for Plant No. 2 (Arcadia Acres), Well No. 1 at Plant No. 18 (Hilltop Manor), and Plant No. 23 (Lee Estates). These levels of iron can be easily reduced by treatment in order to be within the established standard.

Available records of bacteriological tests run in accordance with state requirements, which indicate the level of coliform bacteria in potable water sources, show that Well No. 1 at Plant No. 42 (Tiffany Terrace) has had a history of tests with unsatisfactory results. The records available indicated eight unsatisfactory samples spread out over an eight month period. The Orange County Sewer and Water Department was unable to provide a reason for these unsatisfactory samples, but also did not feel overly concerned that a problem existed at this well (Stewart, 1981). All other wells in the east area have a history of satisfactory results.
Individual data sheets for each of the wells in the east area are shown in the following pages.
Plant Name: No. 1 - Arbor Ridge

Location: 2625 Dean Road; SW \( \frac{x}{2} \) Sec. 8 - T22S-R31E
(Lat. 28°35'02" N, Long. 81°14'42" W)

Date Drilled: 5/28/73-6/14/73

Drilled by: Locke Well and Pump Company

Drill hole diameter: Size: 12 in. Depth: 411 ft

Ground Elevation: 60 ft

Casing Record: Size: 12 in. From depth to depth: 0-99 ft

Static Water Level: 15 ft Date: 6/14/73

Well Yield Drawdown Specific Capacity Date
(gpm) (ft) (gpm/ft drawdown)
1200 8 150 6/18/73
1500 8 187.5 6/18/73
1200 6.5 184.6 6/19/73

Well ownership history: Arbor Properties, Inc.
Orange County (acquired July, 1975)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: +2 8/8/77

WELL PUMP

Motor: Manufacturer: General Electric Horsepower: 25

Type: K R.P.M.: 1800 Serial No.: KKJ1002315 Phase: 3

Model No.: 5K6237XH15B Volts: 230/460 Amps: 63.4/31.7

Type of bearings: Upper - Cat. 5903493P011
Lower - Cat. 629A310AE001

Pump: Manufacturer: Peerless Model No.: 12LB

Number of Stages: 5 Serial No.: 282889

R.P.M.: 1755 Capacity: 500 or 1000* GPM @

85 ft or unknown TDH
Bowl: Model 8HXB

Column Length: 50 ft

Number of Bowls: 5

Diameter: 6 in

* Conflicting Data
Plant Name: No. 2 - Arcadia Acres (formerly Evergreen Terrace)

Location: 7828 Puritan Road; SE 1/4 Sec. 14-T22S-R30E
(Lat. 28°34'18" N, Long. 81°16'55" W)

Date Drilled: 1960  
Ground Elevation: 64 ft

Drill hole diameter: Size 6 in.  
Depth: 210 ft

Casing Record: Size: 6 in  
From depth to depth: 0 - 60 ft

Type of Material: Steel  
Wall Thickness: 0.280 in

Static Water Level: 17 ft  
Date: Unknown

Well ownership history: Southern Gulf Utilities  
Orange County (acquired July, 1975)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S.  
Model: Serial No.: 2838953

Type: HU  
R.P.M.: 3600  
Horsepower: 7.5

Phase: 3  
Volts: 220/440  
Amps: 20/10

Type of bearings: upper thrust - 1-7210 BTC  
Lower guide - 1-62075

Pump: Manufacturer: Jacuzzi  
Model No.: 6MCA3-T240

R.P.M.: 3600  
Capacity: 150 GPM @ 200 ft TDH

Auxiliary engine: Manufacturer: Wisconsin  
Horsepower: 9

Serial No.: 3363140  
Model No.: AGNO  
Type: Gas

Cylinders: 1  
Size: 3½ x 4
Plant Name: No. 4 - Bonneville

Location: 3025 Sprague Drive; SW¼ Sec. 11 + 22S - R31E (Lat. 28°35'18"N, Long. 81°11'14" W)

Date Drilled: 8/17/72 - 9/8/72  Ground Elevation: 60 ft.

Drilled by: Meridith Corporation

Drill hole diameter: Size: 16 in  Depth: 553 ft

Casing Record: Size: 16 in  From depth to depth: 0 - 197 ft

Type of Material: Steel

Static Water Level and Date: 22.5 ft  9/8/72
22.0 ft  9/14/72
28.0 ft  5/7/75

Well yield (gpm)  Drawdown (ft.)  Specific Capacity (gpm/ft. drawdown)  Date
2500  3.5  714.3  unknown
1900  4.0  475  9/14/72

Well ownership history: ANZAC of Florida, Inc.
General Waterworks Corporation (obtained 6/24/65)
Orange County (acquired 12/19/75)

Well usage: Public supply

WELL PUMP

Installed by: Meridith Corporation  Horsepower: 6

Motor: Manufacturer: U.S.  Serial No.: 9302668-E-067
R2061381

Type: RU  R.P.M.: 1800

Phase: 3  Volts: 460  Amps: 72.5

Type of bearings: upper - 7220M
lower - 6211J
Pump: Manufacturer: Worthington  Size: 15H-226-1
Type: Vertical turbine  Number of Stages: 1
Serial No.: VTP-36195  Efficiency: 84%
R.P.M.: 1760  Capacity: 2500 GPM @ 78 ft. TDH
Suction Size: 12 in  Discharge size: 10 in

Bowl: Model: 15H226  Number of bowls: 1  Size: 15 in
Bowl Material: Cast iron  Column length: 80 ft.

Auxiliary engine: Manufacturer: Ford
Model No.: 300GF-6006A  Serial No.: 26835T2HL
Number of cylinders: 6
Plant Name: No. 10 - Corrine Terrace

Well Number: 1

Location: East end Genoa Lane, west of Moselle; SE4, Sec. 16-T22S-R30E (Lat. 28°34'08" N, Long. 81°18'48" W)

Date Drilled: 4/14/59

Drilled by: Tracy Plumbing

Drill hole diameter: Size: 10 in
Depth: 475 ft

Casing Record: Size: 10 in.
From depth to depth: 0 - 225 ft

Type Material: Steel

Static Water Level: 35 ft

Well yield (gpm) Drawdown (ft.) Date

1200
Unknown
Unknown

Well ownership history:
Masters Utilities
Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: + 15 4/12/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 20
Type: VHS R.P.M.: 3600 Phase: 3

Pump: Manufacturer: Peerless Serial No.: 2620217
Type: Vertical turbine Capacity: 300 GPM @ unknown TDH
Plant Name: No. 10 - Corrine Terrace

Well Number: 2

Location: East end Genoa Lane, West of Moselle; SE¼ Sec 16-T22S -R30E (Lat. 28°34'08" N, Long. 81°18'48" W)

Date Drilled: 9/1/70-10/9/70  Drilled by: Meridith Corporation

Ground Elevation: 95 ft

Drill hole diameter: Size: 12 in  Depth: 570 ft

Casing Record: Size: 12 in  From depth to depth: 0 - 215 ft

Type of Material: Steel

Static Water Level: 46 ft  Date: 10/9/70

Well Yield (gpm)  Drawdown (ft)  Specific Capacity (gpm/ft. drawdown)  Date
1800  14  128.6  10/70

Well ownership history: Masters Utilities
Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: +6  4/12/77

WELL PUMP

Motor: Manufacturer: U.S.  Serial No.: 3854603
Type: VHS  R.P.M.: 1800  Horsepower: 100  Phase: 3

Pump: Manufacturer: Worthington  Model: 12H110
Type: Vertical turbine  Number of stages: 5
Serial No.: VTP 27162  R.P.M.: 1760
Capacity: 1000 GPM @ 295 ft TDH
Bowl: Number of Bowls: 5  Size: 11½ in
Column: Length: 100 ft.
Plant Name: No. 13 - East Dale Acres

Location: 1320 Overdale St.; NE ¼ Sec. 24-T22S-R30E
(Lat. 28°03'50" N, Long. 81°15'43" W)

Ground Elevation: 72 ft

Drill hole diameter: Size: 6 in  Depth: 370 ft

Casing Record: Size: 6 in.  From depth to depth: 0-196 or 221 ft*

Type of Material: Steel

Static Water Level: 17 ft.  Date: Unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well Usage: Public Supply

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 7.5
Serial No.: 3101111  R.P.M.: 1800

Pump: Manufacturer: Deming  Model: 4700  Size: 6 in
Type: Vertical turbine  Number of stages: 8
Serial No.: T-32771  R.P.M.: 1750
Capacity: 225 or 250* GPM @ 80 ft. TDH

Bowl: Model: 4482  No. of Bowls: 8

Auxiliary Engine: Manufacturer: Wisconsin  Model No.: THD
Serial No.: 3257467  Type: Gasoline

* Conflicting data
Plant Name: No. 14 - East Highlands

Location: 7701 Marietta St.; NE¼ Sec. 23 - T22S-R30E (Lat. 28°33'58" N, Long. 81°16'58" W)

Date Drilled: 6/30/59 Drilled by: Locke Well & Pump Co.

Ground Elevation: 78 ft

Drill hole diameter: 6 in Depth: 325 in

Casing Record: Size: 6 in From depth to depth: 0-178 ft, 8 in

Static Water Level: 19 ft Date: Unknown

Well ownership history: Locke Well and Pump Company Orange County (acquired Jan., 1974)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Serial No.: MP 6721

Type: A.U. R.P.M.: 3600 Horsepower: 7.5

Phase: 3 Volts: 230/460 Amps: 20.4/10.2

Pump: Manufacturer: Flint & Wallings Model: 6W200407

Type: Submersible Number of stages: 4

R.P.M.: 3500 Capacity: 100 GPM @ 200 ft TDH
Plant Name: No. 17 - High Point

Well Number: 1

Location: 530 High Blvd.; NW ½ Sec. 28-T22S-R31E
(Lat. 28°33'02" N, Long. 81°13'19" W)

Date Drilled: May 1973  Drilled by: Herron Well Drilling

Ground Elevation: 72 ft

Drill hole diameter: Size: 8 in  Depth: 423 ft

Casing Record: Size: 8 in  From depth to depth: 0-126 ft

Static Water Level: 29.82 ft  Date: 6/25/75

Well Yield (gpm)  Drawdown (ft)  Date

600  Unknown  6/25/75

Well ownership history: High Point
                  Orange County

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: Sta-Rite  Horsepower: 20

Pump: Manufacturer: Sta-Rite  Model: 300

Size: 8 in  Type: Submersible

Capacity: 455 GPM @ 86 ft TDH
Plant Name: No. 17 - High Point

Well Number: 2

Location: 530 High Point Blvd.; NW 1/4 Sec. 28-T22S-R31E
(Lat. 28°33'02" N, Long. 81°13'16" W)

Date Drilled: May 1973 Drilled by: Herron Well Drilling

Ground Elevation: 72 ft.

Drill hole diameter: Size: 8 in Depth: 427 ft

Casing Record: Size: 8 in From depth to depth: 0-129 ft

Static Water Level: 31 ft Date: 5/8/73

Well Yield (gpm) Drawdown (ft) Date
600 Unknown 5/8/73

Well ownership history: High Point Orange County

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: Sta-Rite Horsepower: 20

Pump: Manufacturer: Sta-Rite Type: Submersible

Capacity: 455 GPM @ 86 ft TDH
Plant Name: No. 18 - Hilltop Manor

Well Number: 1

Location: 1803 Sue Ann St.; SW ¼ Sec 13-T22S-R30E  
(Lat. 28°34'07" W, Long. 81°16'19" W)

Ground Elevation: 72 ft

Drill hole diameter: Size: 4 or 6* in  
Depth: 180 ft

Casing Record: Size: 4 or 6* in  
From depth to depth: 0-126 ft

Static Water Level: 22 ft  
Date: Unknown

Well ownership history: Southern Gulf Utilities  
Orange County (acquired July, 1975)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: +7 7/13/77

WELL PUMP

Motor: Manufacturer: U.S.  
Horsepower: 3  
Phase: 1

Serial No.: 2335271  
Model No.: CP4H2-8

R.P.M.: 3600  
Volts: 230  
Amps: 18.7

Pump: Manufacturer: Deming  
Model No.: 4701

Type: Submersible  
Serial No.: MT3250

R.P.M.: 3450  
Capacity: 35 GPM @ unknown TDH

Auxiliary Engine: None

* Conflicting data
Plant Name: No. 18 - Hilltop Manor

Well Number: 2

Location: 1803 Sue Ann St.; SW 1/4 Sec. 13-T22S-R30E
(Lat. 28°34'07" W, Long. 81°16'19" W)

Ground Elevation: 72 ft

Drill hole diameter: Size: 4 in    Depth: 180 ft

Casing Record: Size: 4 in.    From depth to depth: 0-126 ft

Static Water Level: 22 ft    Date: unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: Marathon    Horsepower: 3
R.P.M.: 3600    Model No.: UC184CDA7WCW
Phase: 1    Volts: 230

Pump: Manufacturer: Peerless    Type: Jet
Model No.: J3G1    Serial No.: DL266
R.P.M.: 3450    Capacity: 35 GPM @ unknown TDH
Plant Name: No. 23 - Lee Estates

Location: 8201 Ronald Dr.; SW\(^{\frac{1}{2}}\) Sec. 13-T22S-R30E
(Lat. 28°34'12" N, Long. 81°16'34" W)

Date Drilled: 2/19/74  Drilled by: Herron Well Drilling

Type of drilling: Cable-Tool  Ground Elevation: 62.25 ft

Drill hole diameter: Size 6 in  Depth: 292 ft

Casing Record: Size: 6 in  From depth to depth: 0-210 ft

Static Water Level and Date: 19 ft  5/7/75
25 ft  unknown

Well Yield  Drawdown  Specific Capacity  Date
(gpm)  (ft)  (gpm/ft drawdown)  
160  5  32  unknown

Well ownership history: Charter Advisory Company
Orange County (acquired 11/1/76)

Well usage: Public supply

WELL PUMP

Motor: Horsepower: 7.5

Pump: Manufacturer: Sta-Rite  Type: Submersible
Model No.: 190  Size: 6 in  Number of Stages: 5
Capacity: 160 GPM @ 125 ft TDH

Bowl: Number of Bowls: 5  Setting at Bottom: 63 ft
Plant Name: No. 29 - Orlando Acres (formerly Royal Estates)

Well Number: 1

Location: 11608 Judge Ave.; SE¼, Sec. 17-T22S-R31E
(Lat. 28°34'23" N, Long. 81°13'55" W)

Ground Elevation: 71 ft

Drill hole diameter: Size: 8 in  Depth: 350 ft

Casing Record: Size: 8 in  From depth to depth: 0-163 ft

Type of material: Steel

Static Water Level: 24 ft  Date: Unknown

Well Yield (gpm)  Drawdown (ft)  Date
150  Unknown  Unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +37 4/12/77 +2 5/4/77

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 20  Type: VHS

Serial No.: 2979887  R.P.M.: 1800  Phase: 3

Pump: Manufacturer: Deming  Model No.: 4700  Size: 8 in

Type: Vertical turbine  Serial No.: 32474

R.P.M.: 1750  Capacity: 448 or 340* GPM @ ?? TDH

Bowl: Model No.: 517

* Conflicting Data
Plant Name: No. 29 - Orlando Acres (formerly Royal Estates)

Well Number: 2

Location: 11608 Judge Ave.; SE¼ Sec. 17-T22S-R31E
(Lat. 28°34'23" N, Long. 81°13'55" W)

Ground Elevation: 71 ft

Drill hole diameter: Size: 4 in Depth: 352 ft

Casing Record: Size: 4 in From depth to depth: 0-146 ft

Static Water Level: 24 ft Date: Unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: no longer in service (well capped)
Plant Name: No. 29 - Orlando Acres (formerly Royal Estates)
Well Number: 3
Location: 11608 Judge Ave.; SE¼ Sec. 17-T22S-R31E
(Lat. 28°34'23" N, Long. 81°13'55" W)
Date Drilled: 12/10/54
Drilled by: Central Florida Well Drillers
Ground Elevation: 71 ft
Drill hole diameter: Size: 4 in  Depth: 260 ft
Casing Record: Size: 4 in  From depth to depth: 0-146 ft
Type of Material: Steel  Wall Thickness: 0.237 in
Static Water Level: 15 ft  Date: Unknown
Well Yield (gpm)  Drawdown (ft)  Date
50  unknown  unknown
Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)
Well usage: no longer in service (well capped)
Plant Name: No. 42 - Tiffany Terrace

Well Number: 1

Location: 1801 Marcia Dr.; SW¼ Sec. 14-T22S-R30E
   (Lat. 28°34'11" N, Long. 81°17'33" W)

Date Drilled: June, 1959

Drilled by: Central Florida Well Drillers

Ground Elevation: 87 ft

Drill hole diameter: Size: 6 in   Depth: 305 ft

Casing Record: Size: 6 in   From depth to depth: 0-97'11"

Type of Material: Steel

Static Water Level: 35 ft

Well ownership history: Central Florida Utilities
   Orange County (acquired 1977)

Well usage: Public supply

Bacteriological history: 8 unsatisfactory samples: 1/4/77-8/9/77

WELL PUMP

Motor: Manufacturer: U.S.   Horsepower: 7.5

Serial No.: 2759227   R.P.M.: 3600

Phase: 3

Pump: Manufacturer: Jacuzzi   Model No.: T216

Type: Vertical turbine   R.P.M.: 3450

Capacity: 100 or 150* GPM @ Unknown TDH

* Conflicting data
Plant Name: No. 42 - Tiffany Terrace

Well Number: 2

Location: 1801 Marcia Dr.; SW¼ Sec 14 - T22S-R30E
(Lat. 28°34'11" N, Long. 81°17'33" W)

Date Drilled: 1957

Drilled by: Central Florida Well Drillers

Ground Elevation: 87 ft

Drill hole diameter: Size: 10 in Depth: 400 ft

Casing Record: Size: 10 in From depth to depth: 0-110 ft

Type of Material: Steel

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 50

R.P.M.: 1800 Phase: 3

Pump: Manufacturer: Layne-Bowler Model: T66

Type: Vertical turbine R.P.M.: 1750

Capacity: 800 GPM @ Unknown TDH
Plant Name: No. 43 - University Park

Location: 11550 Nona Dr.; SE ¼ Sec. 9-T22S-R31E
(Lat. 28°35'24" N, Long. 81°12'44" W)

Date Drilled: 11/14/68

Drilled by: Locke Well and Pump Company

Ground Elevation: 53 ft

Drill hole diameter: Size: 12 in   Depth: 423 or 493 ft*

Casing Record: Size: 12 in.   From depth to depth: 0-177 ft

Static Water Level: 10 ft   Date: November 1968

Well ownership history: First Florida Utilities
University Park Utilities
Orange County

Well usage: Public Supply

WELL PUMP

Motor: Manufacturer: U.S.   Horsepower: 30

Volts: 230/460

Pump: Type: Vertical turbine

Capacity: 500 GPM @ Unknown TDH

Auxiliary Engine: None

* Conflicting data
Plant Name: College Heights (Plant not in service)

Well Number: 1

Location: Percival Road, south of Lake Price; SW ¼ Sec 12-T22S-R31E
          (Lat. 28°35'28" N +, Long. 81°10'35" W+)

Date Drilled: 5/30/74-6/21/74

Drilled by: Locke Well and Pump Company

Ground Elevation: 55 ft ±

Drill hole diameter: Size: 12 in  Depth: 465 ft

Casing Record: Size: 12 in  From depth to depth: 0-237'9"

Grouting: None

Static Water Level: 16 ft  Date: 6/21/74

Well Yield  Drawdown  Specific Capacity  Date
(gpm)  (ft)  (gpm/ft drawdown)
1800  6  300  unknown

Well ownership history: Oriole Homes Corporation
Orange County

Well usage: Not in service

WELL PUMP

Motor: Manufacturer: General Electric  Horsepower: 25
Type: VHS  R.P.M.: 1800
Phase: 3  Volts: 230/460

Pump: Manufacturer: Peerless  Type: Vertical turbine
Number of stages: 3  R.P.M.: 1800
Capacity: 750 GPM @ 84 ft TDH

Bowl: Column length: 70 ft  Diameter: 8 in
Plant Name: College Heights (plant not in service)

Well Number: 2

Location: Percival Rd., S/O Lake Price; SW¼ Sec. 12-T22S-R31E (Lat. 28°35'28'' N+, Long. 81°10'35'' W+)

Date Drilled: 8/18/75-9/24/75

Drilled by: Locke Well and Pump Company

Type of Drilling: Cable-Tool

Ground Elevation: 55 ft +

Drill hole diameter: Size: 12 in Depth: 449 ft

Casing Record: Size: 12 in. From depth to depth: 0-239 ft, 10 in

Type of Material: Black steel

Static Water Level and Date: 8 ft, 11 in 9/18/75
9 ft, 3 in 9/23/75

Well Yield (gpm) Drawdown Specific Capacity (gpm/ft drawdown) Date
2000 16 ft, 1 in 124.4 9/19/75

Well ownership history: Oriole Homes Corporation
Orange County

Well usage: Not in service

WELL PUMP

Motor: Horsepower: 25 Type: VHS
R.P.M.: 1800 Phase: 3 Volts: 230/460

Pump: Manufacturer: Peerless Model No.: TI-12299
Type: Vertical turbine Number of stages: 3
R.P.M.: 1760 Capacity: 2000 GPM @ Unknown TDH
Efficiency: 81%
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<tr>
<th>Bowl: Model No.:</th>
<th>10HXB</th>
<th>Number of bowls:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column: Length:</td>
<td>70 ft</td>
<td>Diameter:</td>
<td>8 in</td>
</tr>
</tbody>
</table>
There are twelve water treatment plants in the southeast area, eight of which are active. At these plants there are eleven wells presently in service and twelve which are not in service. The area is bounded by Lake Underhill Road on the north, Econlochatchee Trail on the east, McCoy Road on the south, and Orange Avenue on the west. These treatment plants are listed in Table V-1 and their locations are shown in Figure V-1.

Table V-2 shows elevation and depth data for each well, the well's casing pipe, and its static water level. All but two of the wells penetrate only the upper level of the Floridan Aquifer. The wells from Plant No. 3 (Azalea Park) and Plant No. 36 (Rio Pinar) penetrate the lower level of the aquifer. The deepest of the wells in the upper level of the Aquifer is 685 feet. The shallowest well is 210 feet deep and the mean is 342 feet below the surface when not including the lower level of the Aquifer. Casing pipe depths average 160 feet when not including the lower level, with the deepest being 305 feet and the shallowest 70 feet. Static water level depths ranged from 27 to 66 feet below ground service, with the mean being 42 feet. A comparison to U.S.G.S. piezometric surface level maps indicated reasonable
### TABLE V-1

**ORANGE COUNTY WELLS LOCATED IN SOUTHEAST AREA**

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<thead>
<tr>
<th>Plant Number</th>
<th>Plant Name</th>
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<td>Azalea Park</td>
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<td>Conway (formerly Conway Manor)</td>
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<tr>
<td>8</td>
<td>Conway East (formerly East Orlando)</td>
</tr>
<tr>
<td>9</td>
<td>Conway West (formerly Lake Margaret Terrace)</td>
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<tr>
<td>15</td>
<td>Graham Gardens</td>
</tr>
<tr>
<td>36</td>
<td>Rio Pinar</td>
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<tr>
<td>40</td>
<td>Shady Acres</td>
</tr>
<tr>
<td>41</td>
<td>Silver Beach</td>
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<tr>
<td>Inactive</td>
<td>Conway Hills</td>
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<tr>
<td>Inactive</td>
<td>Hi Pines</td>
</tr>
<tr>
<td>Inactive</td>
<td>Robinsdale</td>
</tr>
<tr>
<td>Inactive</td>
<td>Robinson Oaks</td>
</tr>
</tbody>
</table>
Fig. V-1. Location map for southeast area wells.
<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Grnd Elev. ft., MSL</th>
<th>Well Depth (ft)</th>
<th>Casing Depth (ft)</th>
<th>Static Water Level (ft)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
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<td>1136/1100**</td>
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<td>427/450**</td>
<td>70/149**</td>
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<td>---</td>
</tr>
<tr>
<td>36</td>
<td>-</td>
<td>80</td>
<td>1120/1300**</td>
<td>1000</td>
<td>30/37*</td>
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</table>

* Readings taken on different dates
** Conflicting data from different references
***Not including lower Floridan Aquifer values
agreement in all cases except Well No. 1 at the inactive Conway Hills Plant. The reading of 76 feet MSL recorded in 1962 exceeds the highest value of surface water level shown for this location on the available U.S.G.S. maps (September, 1960 - 67 feet MSL). It is the writer's opinion that the value recorded for this well and shown on the data sheet is an erroneous number.

Table V-3 indicates pumping data from each well. Tested pumping rates in this area ranged from a low of 60 GPM to a high of 3,000 GPM, with the mean being 637. Available data from the wells indicate specific capacity varies from 53.9 to 103.4 GPM per foot drawdown, averaging 82.4. Flow per unit well circumference has a mean value of 21.31 GPM per inch, with a range of 3.18 to 83.56. Specific capacity per unit well circumference ranges from 0.85 to 3.58 GPM per foot of drawdown per inch circumference, with an average value of 1.57.

Table V-4 gives chemical data for the wells in the southwest area. All wells are within the established limits for total dissolved solids and chloride. All are within the hardness classifications of either moderately hard or hard, with the hardest being 207 mg/l. Iron levels are at or above the limits for Well No. 1 at Plant No. 15 (Graham Gardens) and Well No. 1 at the out-of-service Robinsdale Plant.

Bacteriological test results indicate there has been a history of unsatisfactory levels of coliform bacteria in Well No. 1 at
Plant No. 15 (Graham Gardens) and in Well No. 1 at Plant No. 40 (Shady Acres). Several drainage wells are located near the Graham Gardens Water Plant, including one within 500 feet. It is the opinion of the Orange County Sewer and Water Department that pollutants deposited into these wells over the years have caused the unsatisfactory samples. No explanation could be offered for the Shady Acres Water Plant, but the Department is not overly concerned that a problem exists at this plant (Stewart, 1981).

Individual data sheets for each of the southeast area wells are included in the following pages.
### TABLE V-3

**SOUTHEAST AREA WELLS - PUMPING DATA**

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Max. Pumping Test Flow (gpm)</th>
<th>Specific Capacity (gpm/ft drawdown)</th>
<th>Flow per Unit Well Circumference (gpm/in circum.)</th>
<th>Specific Capacity per Unit Well Circumference (gpm/ft drawdown-in circum.)</th>
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<tr>
<td>3</td>
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<td>2,100</td>
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*Conflicting Data from different references.
### TABLE V-4

**SOUTHEAST AREA WELLS - WATER QUALITY DATA**

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Total Dissolved Solids (mg/l)</th>
<th>Total Alkalinity CaCO₃ (mg/l)</th>
<th>Total Hardness CaCO₃ (mg/l)</th>
<th>Chloride Cl (mg/l)</th>
<th>Sulfide S (mg/l)</th>
<th>Iron Fe (mg/l)</th>
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<td>Hi Pines</td>
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<td>114</td>
<td>132</td>
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<td>0.3</td>
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<tr>
<td>Robinson</td>
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<td>Oaks</td>
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<td>207</td>
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<td>Lowest</td>
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<td>80</td>
<td>79</td>
<td>2</td>
<td>0.03</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Plant Name: No. 3 - Azalea Park

Location: 901 Capehart Dr.; NW Sec. 35-T22S-R30E
(Lat. 28°32'02" W., Long. 81°17'25" W)

Date Drilled: 1955 Drilled by: Meridith Corporation

Type of Drilling: Cable-tool

Ground Elevation: 90 ft

Drill hole diameter: Size: 8 or 10 in* Depth: 1236 or 1250 ft*

Casing Record: Size: 18 in From depth to depth: 0-154 ft
12 in 0-490 ft
8 or 10 in* 450-1136 or 1100* ft

Type of Material: Black iron

Static Water Level: 43.18 ft Date: 6/27/62

Well Yield Drawdown Specific Capacity Date
(gpm) (ft) (gpm/ft drawdown)

| 540 | 6 | 90 | 6/27/62 |

Well ownership history: First Florida Utilities, Inc. Orange County (acquired 1977)

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +9 5/5/77
+48 5/10/77
+20 10/5/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 75

Serial No.: R-2847-04H-292 R2072620E Type: VHS

R.P.M.: 1800 Phase: 3 Volts: 460 Amps: 72

Type of bearings: Upper - 7220M Lower - 6211J
Pump: Manufacturer: Peerless
Type: Vertical turbine
Serial No.: TI-08669
Capacity: 2100 GPM @ 120 ft TDH
Efficiency: 81%

Bowl: Type: 2608370CIE
No. of bowls: 3

* Conflicting data
Plant Name: No. 7 - Conway (formerly Conway Manor)

Well Number: 1

Location: 4750 Manatee St.; SW Sec 15-23S-30E
       (Lat. 28°29'12" N, Long. 81°18'15" W)

Date Drilled: February 1960

Drilled by: Central Florida Well Drillers

Ground Elevation: 97 ft.

Drill hole diameter: Size: 12 in.  Depth: 427 or 450* ft

Casing Record: Size: 12 in  From depth to depth: 0-70 ft
       or 148 ft, 11 in*

Static Water Level: 34 ft  Date: 1960

Well ownership history: First Florida Utilities, Inc.
       Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 75
Type: VHS
Phase: 3

R.P.M.: 1800  Volts: 230/460

Pump: Manufacturer: Layne  Model No.: TF1018
Type: Vertical turbine  Number of stages: 5
R.P.M.: 1750  Capacity: 1500 GPM @ 115 ft TDH
Efficiency: 80%  Suction Size: 8 in  Discharge size: 10"

Bowl: Type: 10 MHC  Number of bowls: 5
Bowl Material: Cast iron  Column Length: 70 ft
   * Conflicting data  Diameter: 8 in
Plant Name: No. 7 - Conway (formerly Conway Manor)

Well Number: 2

Location: 4750 Manatee St.; SW ¼ Sec 15-T23S-R30E
(Lat. 28°29'09" N, Long. 81°18'16" W)

Date Drilled: 6/1/65

Drilled by: Meridith Well Drillers

Ground Elevation: 97 ft

Drill hole diameter: Size: 12 in.  Depth: 443 ft, 9 in

Casing Record:  Size: 12 in  From depth to depth: 0-157 ft

Static Water Level: 50 ft  Date: 6/1/65

Well ownership history: First Florida Utilities, Inc.
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 60

Pump: Manufacturer: Worthington

Type: Vertical turbine  Capacity: 1400 GPM @ Unknown TDH
Plant Name: No. 8 - Conway East (formerly East Orlando)

Well Number: 1

Location: 8140 Yount Drive; NW 1/4 Sec. 13-T23S-R30E
       (Lat. 28°29'37" N, Long. 81°16'31" W+)

Date Drilled: 10/7/71-11/3/71

Drilled by: Layne Atlantic Corporation

Ground Elevation: 86 ft +


Casing Record: Size: 24 in From depth to depth: 0-70 ft
       16 in 0-305 ft

Type of Material: Steel for both sizes

Grouting: from 0 ft to 70 ft. and from 0 ft to 305 ft.

Static Water Level: 40 ft Date: 11/3/71

<table>
<thead>
<tr>
<th>Well Yield (gpm)</th>
<th>Drawdown (ft)</th>
<th>Specific Capacity (gpm/ft drawdown)</th>
<th>Date</th>
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<tbody>
<tr>
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<td>29</td>
<td>103.4</td>
<td>11/3/71</td>
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<td>2500</td>
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<td>11/3/71</td>
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<tr>
<td>2000</td>
<td>16</td>
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<td>11/3/71</td>
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<tr>
<td>1500</td>
<td>12</td>
<td>125.0</td>
<td>11/3/71</td>
</tr>
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</table>

Well ownership history: East Orlando Utilities
General Waterworks Corporation
Orange County (acquired 12/19/75)

Well usage: Public supply

**WELL PUMP**

Motor: Manufacturer: U.S. Horsepower: 75
R.P.M.: 1800

Pump: Manufacturer: Worthington R.P.M.: 1800
Type: Vertical turbine Serial No.: 14MH220
Capacity: 2250 GPM @ unknown TDH
Check Valve: Dresser  Gate Valve: Dresser
Auxiliary Engine: None
Plant Name: No. 8 - Conway East (formerly East Orlando)

Well Number: 2

Location: 8140 Yount Dr.; NW ¼ Sec 13-T23S-R30E
        (Lat. 28°29'37" N, Long. 81°16'31" W+)

Date Drilled: 9/8/59-10/9/59

Drilled by: Meridith Corporation

Ground Elevation: 86 ft +

Drill hole diameter: Size: 12 in        Depth: 528 ft

Casing Record: Size: 12 in.            From depth to depth: 0-258',9"

Type of Material: Steel

Static Water Level: 27 ft            Date: 10/9/59

Well Yield
         Drawdown
( gpm)    (ft)    Date
Unknown    10       10/9/59

Well ownership history: East Orlando Utilities
            General Waterworks Corporation
            Orange County (acquired 12/19/75)

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +5 4/7/77
                      +3 4/11/77
                      +6 7/6/77

WELL PUMP

Motor: Manufacturer: U.S.       Horsepower: 20
       Serial No.: 2916071
R.P.M.: 1800
Phase: 3   Volts: 220/440     Amps: 50/25
Type of bearings: Upper - TH1-7217BTC
                 Lower guide - 1-6210J
Pump: Manufacturer: Jacuzzi  Model No.: 10MSA2
Type: Vertical turbine  Number of Stages: 4
Serial No.: T80D EKK 375  R.P.M.: 1750
Capacity: 600 GPM @ 120 ft TDH

Bowl: Number of bowls: 4  Size: 11\(\frac{1}{2}\) in.

Auxiliary engine: Manufacturer: Hercules
Model No.: GO-169  Type: LP Gas
Horsepower: 30
Plant Name: No. 9 - Conway West (formerly Lake Margaret Terrace)

Well Number: 1

Location: 3209 Joanne Dr.; NW 1/2 Sec 8 - T23S - R30E
(Lat. 28°30'13" N, Long. 81°20'34" W)

Date Drilled: 1/17/58 - 1/28/58

Drilled by: Central Florida Well Drillers

Ground Elevation: 100 ft

Drill hole diameter: Size: 6 in  Depth: 325 ft

Casing Record: Size: 6 in  From depth to depth: 0-140.5"

Type of Material: Steel  Wall Thickness: 0.280 in.

Static Water Level and Date: 31 ft  1958
40 ft  unknown

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply (plant temporarily out of service)

Bacteriological history: Unsatisfactory sample: +2 6/2/77

WELL PUMP

Motor: Manufacturer: Westinghouse  Model No.: 641

Horsepower: 25  Serial No.: 1167993

R.P.M.: 1800  Phase: 3

Pump: Manufacturer: Cook  Model No.: 8353

Type: Vertical turbine  R.P.M.: 1765

Capacity: 600 GPM @ Unknown TDH
Plant Name: No. 9 - Conway West (formerly Lake Margaret Terrace)

Well Number: 2

Location: 3209 Joanne Dr.; NW Sec 8-T23S-R30E (Lat. 28°30'13" N, Long. 81°20'34" W)

Date Drilled: 4/4/59-5/15/59

Drilled by: Central Florida Well Drillers

Type of Drilling: Cable-tool

Ground Elevation: 100 ft

Drill hole diameter: Size: 8 in. Depth: 345 ft

Casing Record: Size: 8 in. From depth to depth: 0-148 ft

Type of Material: Black iron

Static Water Level: 31 ft Date: 1958

Well ownership history: Central Florida Utilities Orange County (acquired 1977)

Well usage: Public supply (plant temporarily out of service)

Bacteriological history: Unsatisfactory sample: +5 8/1/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15

Serial No.: L-5119-17430-1-1 R.P.M.: 3600

Model No.: 256 UP Phase: 3

Pump: Manufacturer: Sta Rite Type: Vertical turbine

R.P.M.: 3450 Capacity: 350 GPM @ Unknown TDH
Plant Name: No. 15 - Graham Gardens

Well Number: 1

Location: End of Watts Ave., North of McCoy Rd., SE\textsuperscript{\frac{1}{4}} Sec. 25-T23S-R29E (Lat. 28°27'23" N, Long. 81°21'37" W ±)

Date Drilled: 1958

Ground elevation: 95 ft +

Drill hole diameter: Size: 6 in Depth: 380 ft

Casing Record: Size: 6 in From depth to depth: 0-?? ft

Type of Material: Steel

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: 6 unsatisfactory samples: 3/2/77-10/4/77

**WELL PUMP**

Motor: Manufacturer: G.E. Horsepower: 5

Type: Hollowshaft R.P.M.: 1800

Model No.: 169 Phase: 3

Pump: Manufacturer: Goulds Model No.: UD64SMSPL

Type: Submersible R.P.M.: 1800

Capacity: 60 GPM @ Unknown TDH
Plant Name: No. 15 - Graham Gardens

Well Number: 2

Location: End of Watts Ave., North of McCoy Rd., SE ½ Sec. 25-T23S-R29E
(Lat. 28°27'23" N, Long. 81°21'37" W+)

Date Drilled: 1975

Ground Elevation: 95 ft +

Drill hole diameter: Size: 8 in Depth: 685 ft

Casing Record: Size: 8 in. From depth to depth: 0-unknown ft

Type of Material: Steel

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: No longer in service

Bacteriological history: Unsatisfactory sample: +4 8/1/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15
R.P.M.: 3600 Model No.: R2959-00-170
Phase: 3

Pump: Manufacturer: Worthington
Model No.: 4A-T-451 Type: Vertical turbine
R.P.M.: 3600 Capacity: 300 GPM @ unknown TDH
Plant Name: No. 36 - Rio Pinar

Location: 8709 El Prado Dr.; SE ¼ Sec 36-T22S-R30E
(Lat. 28°31'35" N, Long. 81°15'52" W)

Date Drilled: 7/29/57

Drilled by: Sydnor Pump and Well Company

Type of Drilling: Rotary and Cable-tool

Ground Elevation: 80 ft

Drill hole diameter: Size: 12 or 20 in*

Depth: 1120 or 1300 ft*

Casing Record: Size: 12 or 20 in*

From depth to depth: 0-unknown or 1000 ft*

Type of Material: Black iron

Static Water Level and Date: 30 ft 7/29/57
36'9" 1/9/78

Well Yield (gpm) Drawdown (ft) Specific Capacity (gpm/ft drawdown) Date

508 5 101.6 7/29/57
1740 32.3 53.9 1/19/78

Well ownership history: First Florida Utilities, Inc.
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Installed by: Layne Atlantic Co.
Horsepower: 75 Type: TF R.P.M.: 1800
Phase: 3 Volts: 480
Pump: Manufacturer: Layne and Bowler
Model No.: 10 MHC
Type: Vertical turbine
Serial No.: T-A3301
Number of stages: 5
Capacity: 1550 GPM @ 125 ft TDH
Efficiency: 80%
Suction Size: 8 in
R.P.M.: 1750
Check Valve: 10 in
Discharge Size: 8 in
Bowl: Type: MHC
Number of bowls: 5
Bowl Material: Cast iron
Column Length: 80 ft
Diameter: 9-5/8 in

* Conflicting data
Plant Name: No. 40 - Shady Acres

Well Number: 1

Location: 3313 Coe Ave.; NW Sec 5-T23S-R30E
(Lat. 28°31'21" N, Long. 81°20'29" W)

Date Drilled: 4/17/56-4/24/56
Drilled by: Central Florida Well Drillers

Type of drilling: Cable-tool

Ground Elevation: 112 ft

Drill hole diameter: Size: 6 in Depth: 265 ft.

Casing Record: Size: 6 in. From depth to depth: 0-140 ft

Type of material: Black iron

Wall Thickness: 0.280 in

Static Water Level: 66 ft Date: 1956

Well ownership history: Central Florida Utilities Orange County (acquired 1977)

Well usage: Public supply

Bacteriological history: 9 unsatisfactory samples: 2/2/77-11/3/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 10
R.P.M.: 3600 Phase: 3

Pump: Manufacturer: Peerless Type: Vertical turbine
Serial No.: 176114 R.P.M.: 3450
Capacity: 250 GPM @ Unknown TDH

Auxiliary Engine: Horsepower: 7.5
Plant Name: No. 40 - Shady Acres

Well Number: 2

Location: 3313 Coe Ave.; NW¼ Sec. 5-T23S-R30E
(Lat. 28°31'21" N, Long. 81°20'29" W)

Date Drilled: 1954

Drilled by: Central Florida Well Drillers:

Ground elevation: 112 ft

Drill hole diameter: Size: 6 in      Depth: 260 ft

Casing Record: Size: 6 in     From depth to depth: 0-unknown ft

Type of material: Steel     Wall Thickness: 0.280 in

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: no longer in service

WELL PUMP

Motor: Manufacturer: U.S.      Horsepower: 5
R.P.M.: 3600      Phase: 3

Pump: Manufacturer: Fairbanks Morse
Type: Vertical turbine     Serial No.: SW-23478
R.P.M.: 3450      Capacity: 100 GPM @ Unknown TDH
Plant Name: No. 41 - Silver Beach

Well Number: 1

Location: 7500 Dophine Ave.; SW ¼ Sec 29-T23S-R30E
(Lat. 28°27'28" N, Long. 81°20'15" W)

Date Drilled: 4/8/58-4/9/58

Drilled by: Central Florida Well Drillers

Type of Drilling: Cable-Tool

Ground Elevation: 96 ft

Drill hole diameter: Size: 6 in

Casing Record: Size: 6 in.

Type of Material: Steel

Static Water Level: 32 ft

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: Franklin Horsepower: 20
R.P.M.: 3600 Phase: 3
Volts: 230

Pump: Manufacturer: Berkeley Model No.: G52AM6
Type: Submersible Number of Stages: 6
Serial No.: 7608249

Capacity: 300 GPM @ 215 ft TDH

Bowl: Number of bowls: 6 Size: 5-3/4" Material: Cast iron
Plant Name: No. 41 - Silver Beach

Well Number: 2

Location: 7500 Dophine Ave.; SW½ Sec 29-T23S-R30E (Lat. 28°27'28" N, Long. 81°20'15" W)

Date Drilled: 1/10/57-1/17/57

Drilled by: Central Florida Well Drillers

Ground Elevation: 97 ft

Drill hole diameter: Size: 4 in Depth: 245 ft

Casing Record: Size: 4 in From depth to depth: 0-162 ft

Type of Material: Steel Wall Thickness: 0.237 in

Static Water Level: 43 ft Date: Unknown

Well ownership history: Central Florida Utilities Orange County (acquired 1977)

Well usage: no longer in service

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 5
Serial No.: 2643005 R.P.M.: 3600
Volts: 230 Phase: 3

Pump: Manufacturer: Sta-Rite Model No.: 12-1
Type: Vertical turbine R.P.M.: 3450
Capacity: 100 GPM @ unknown TDH
Plant Name: No. 41 - Silver Beach

Well Number: 3

Location: 7500 Dophine Ave.; SW¼ Sec 29-T23S-R30E
(Lat. 28°27'28" N, Long. 81°20'15" W)

Date Drilled: 4/9/57-4/23/57

Drilled by: Central Florida Well Drillers

Ground Elevation: 97 ft

Drill hole diameter: Size: 4 in Depth: 230 ft

Casing Record: Size: 4 in From depth to depth: 0-151 ft

Type of Material: Steel Wall Thickness: 0.237 in

Static Water Level: 36 ft Date: Unknown

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: no longer in service

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 5
Serial No.: 264B60 R.P.M.: 3600

Model No.: SCV Phase: 3 Volts: 230

Pump: Manufacturer: Deming Model No.: 4300

Type: Vertical turbine R.P.M.: 3450

Capacity: 100 GPM @ Unknown TDH
Plant Name: Conway Hills (plant not in service)

Well Number: 1

Location: Gasparilla Place, South of Pinellas Dr.; NW Sec. 16-T23S-R30E (Lat. 28°29'18" N, Long. 81°19'28"W)

Date Drilled: 1959

Drilled by: Central Florida Well Drillers

Ground Elevation: 110.62 ft

Drill hole diameter: Size: 6 in  Depth: 280 ft

Casing Record: Size: 6 in  From depth to depth: 0-182.5 ft

Type of Material: Steel  Wall Thickness: 0.280 in

Static Water Level: 35 ft  Date: 1962

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 30
Serial No.: 3224260  R.P.M.: 3600  Phase: 3

Pump: Manufacturer: Deming  Type: Vertical turbine
Serial No.: 31117  R.P.M.: 3600

Capacity: 700 GPM @ 140 ft TDH
Plant Name: Conway Hills (plant not in service)
Well Number: 2
Location: Gasparilla Place, South of Pinellas Dr.; NW¼ Sec 16-T23S-R30E (Lat. 28°29'18" N, Long. 81°19'28"W)
Date Drilled: 1948
Drilled by: Central Florida Well Drillers
Type of drilling: Cable-tool
Ground Elevation: 107 ft
 Drill hole diameter: Size: 8 in  Depth: 406 in
Casing Record: Size: 8 in  From depth to depth: 0-130 ft
Type of Material: Black iron
Static Water Level: 52 ft  Date: 1948
Well ownership history: Central Florida Utilities
Orange County (acquired 1977)
Well usage: No longer in service

WELL PUMP
Motor: Manufacturer: U.S.  Horsepower: 20
Serial No.: R-9221-00-C-849  Phase: 3
Pump: Manufacturer: Peerless  Type: Vertical turbine
Serial No.: 1956-33  R.P.M.: 3450
Capacity: 400 or 500* GPM @ 200 or 140 ft* TDH
Bowl: Column: Length: 70 ft  Diameter: 4 in
Auxiliary engine: Horsepower: 30  *Conflicting data
Plant Name: H§ Pines (Plant not in service)

Well Number: 1

Location: South of Anderson Dr.; East of Conway Rd.; SE¼ Sec 8-T23S-R30E (Lat. 28°30'01"N, Long. 81°19'49"W)

Date Drilled: 5/28/58-6/4/58

Drilled by: Central Florida Well Drillers

Ground Elevation: 107 ft +

Drill hole diameter: Size: 4 in    Depth: 215 ft

Casing Record: Size: 4 in    From depth to depth: 0-141 ft

Type of Material: Steel    Wall Thickness: 0.237 in

Static Water Level: 40 ft    Date: 6/4/58

Well ownership history: Central Florida Utilities
Orange County (Acquired 1977)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: U.S.    Horsepower: 5
Serial No.: 2310249    R.P.M.: 3600    Phase: 3

Pump: Manufacturer: Sta-Rite    Type: Vertical turbine
R.P.M.: 3450    Capacity: 100 GPM @ Unknown TDH
Plant Name: Hi Pines (Plant not in service)

Well Number: 2

Location: South of Anderson Dr.; East of Conway Rd.; SE 1/4 Sec 8-T23S-R30E (Lat. 28°30'01" N, Long. 81°19'43" W)

Date Drilled: 1959

Drilled by: Central Florida Well Drillers

Type of drilling: Cable-tool

Ground Elevation: 107 ft

Drill hole diameter: Size: 4 in  Depth: 230 ft

Casing Record: Size: 4 in  From depth to depth: 0-126 ft

Type of Material: Black iron  Wall Thickness: 0.237 in

Static Water Level: 50 ft  Date: 1959

Well Yield (gpm)  Drawdown (ft)  Date
60  Unknown  1959

Well ownership history: Central Florida Utilities  Orange County (acquired 1977)

Well usage: no longer in service

WELL PUMP

None
Plant Name: Robinsdale (plant not in service)
Well Number: 1
Location: Rogan Rd., South of Dublin St.; NE Sec 8-T23S-R30E
   (Lat. 28°30'26" N, Long. 81°20'00" W)
Date Drilled: 4/29/58-5/13/58
Drilled by: Central Florida Well Drillers
Type of drilling: Cable-tool
Ground Elevation: 103 ft
Drill hole diameter: Size: 8 in Depth: 360 ft
Casing Record: Size: 8 in From depth to depth: 0-142 ft
Type of Material: Black iron
Static Water Level: 40 ft Date: 5/13/58
Well ownership history: Central Florida Utilities
   Orange County (acquired 1977)
Well usage: no longer in service

WELL PUMP
Motor: Manufacturer: U.S. Horsepower: 30
Type: Vertical R.P.M.: 3600
Model: RU Phase: 3
Pump: Manufacturer: Goulds Model No.: 73-275
Type: Vertical turbine Number of stages: 5
R.P.M.: 3600 Capacity: 400 GPM @ Unknown TDH
Plant Name: Robinsdale (plant not in service)

Well Number: 2

Location: Rogan Rd.; South of Dublin St.; NE \( \frac{1}{4} \) Sec 8-T23S-R30E (Lat. 28°30'26" N, Long. 81°20'00" W)

Date Drilled: 1959

Drilled by: Central Florida Well Drillers

Ground Elevation: 103 ft

Drill hole diameter: Size: 6 in   Depth: 310 ft

Casing Record: Size: 6 in   From depth to depth: 0-133 ft

Type of material: Steel   Wall Thickness: 0.280 in

Static Water Level: 42 ft   Date: Unknown

Well ownership history: Central Florida Utilities Orange County (acquired 1977)

Well usage: No longer in service

WELL PUMP


Pump: Manufacturer: Sta-Rite   Type: Vertical turbine

R.P.M.: 3450   Capacity: 200 GPM @ Unknown TDH
Plant Name: Robinson Oaks (plant not in service)

Well Number: 1

Location: Montrose Ct.; South of Anderson Rd.; SE 1/4 Sec 8-T23S-R30E (Lat. 28°30'03" N, Long. 81°20'03" W)

Date Drilled: 3/25/57-3/28/57

Drilled by: Central Florida Well Drillers

Ground Elevation: 102 ft

Drill hole diameter: Size: 4 in

Casing Record: Size: 4 in

Type of Material: Steel

Static Water Level: 52 ft

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: no longer in service

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 7.5

Type: K R.P.M.: 3600

Model No.: 5K225XA4B Phase: 3

Volts: 220/440 Amps: 14.2/7.1

Pump: Manufacturer: Berkley Model No.: 4D2CL

Type: Vertical turbine Serial No.: 2475J

R.P.M.: 3450 Capacity: 150 GPM @ Unknown TDH
Plant Name: Robinson Oaks (plant not in service)

Well Number: 2

Location: Montrose Ct.; South of Anderson Rd.; SE\% Sec 8-T23S-R30E (Lat. 28\°30'03" N, Long. 81\°20'03" W)

Date Drilled: 4/27/57-4/30/57

Drilled by: Central Florida Well Drillers

Ground Elevation: 102 ft

Drill hole diameter: Size: 4 in Depth: 210 ft

Casing Record: Size: 4 in From depth to depth: 0-154 ft

Type of Material: Steel Wall Thickness: 0.237 in

Static Water Level: 51 ft Date: 4/30/57

Well ownership history: Central Florida Utilities Orange County (acquired 1977)

Well usage: no longer in service

WELL PUMP

Motor: Manufacturer: A.O. Smith Horsepower: 5

R.P.M.: 3600

Pump: Manufacturer: Sta-Rite Model No.: H998

R.P.M.: 3450 Capacity: 100 GPM @ Unknown TDH
CHAPTER VI
SOUTHWEST AREA WELLS

The southwest area has nine active and one inactive water treatment plants. At these plants, there are nine wells presently in service and two which are no longer in service. The area is bounded by Roberts Road on the north, Kirkman Road and Shingle Creek on the east, Vistana Boulevard on the south, and Lake Butler on the west. These plants are listed in Table VI-1 and their locations are shown in Figure VI-1.

Table VI-2 provides elevation and depth data for these wells. All of them penetrate the upper level of the Floridan Aquifer, with the deepest being 580 feet, the shallowest 150 feet, and the mean 368 feet below ground surface. Casing pipe depths range from 119 feet to 219 feet below the ground surface, averaging 166 feet. At the time static water table depths were measured, they ranged from 24 to 88 feet below ground surface, with the mean being 38 feet. All static water level values are in reasonable agreement with levels shown on U.S.G.S. piezometric surface level maps.

Table VI-3 gives pumping data for the wells. The mean flow rate was computed to be 725 GPM, with the range being from 40 to 2500 GPM. For the wells from which data was available, the specific capacity varied from 71.4 to 500.0 GPM per foot of drawdown,
### TABLE VI-1

**ORANGE COUNTY WELLS LOCATED IN SOUTHWEST AREA**

<table>
<thead>
<tr>
<th>Plant Number</th>
<th>Plant Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Down Point</td>
</tr>
<tr>
<td>16</td>
<td>Hidden Springs (also known as Marsha Park)</td>
</tr>
<tr>
<td>19</td>
<td>Kelso-on-Lake-Butler</td>
</tr>
<tr>
<td>20</td>
<td>Lake Down</td>
</tr>
<tr>
<td>28</td>
<td>Orangewood</td>
</tr>
<tr>
<td>45</td>
<td>Vistana</td>
</tr>
<tr>
<td>46</td>
<td>Wauseon Ridge</td>
</tr>
<tr>
<td>48</td>
<td>Windermere</td>
</tr>
<tr>
<td>49</td>
<td>Windermere Downs</td>
</tr>
<tr>
<td>Inactive</td>
<td>Lake Cane</td>
</tr>
</tbody>
</table>
Fig. VI-1. Location map for southwest area wells.
<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Grnd Elev. ft., MSL</th>
<th>Well Depth (ft)</th>
<th>Casing Depth (ft)</th>
<th>Static Water Level (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>-</td>
<td>115</td>
<td>200</td>
<td>-85</td>
<td>30</td>
</tr>
<tr>
<td>16</td>
<td>-</td>
<td>150</td>
<td>492</td>
<td>-342</td>
<td>85/88*</td>
</tr>
<tr>
<td>19</td>
<td>-</td>
<td>108</td>
<td>420</td>
<td>-312</td>
<td>24</td>
</tr>
<tr>
<td>20</td>
<td>-</td>
<td>135</td>
<td>150</td>
<td>-15</td>
<td>--</td>
</tr>
<tr>
<td>28</td>
<td>-</td>
<td>94</td>
<td>500</td>
<td>-406</td>
<td>30</td>
</tr>
<tr>
<td>45</td>
<td>-</td>
<td>111</td>
<td>580</td>
<td>-469</td>
<td>26</td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>110</td>
<td>388</td>
<td>-278</td>
<td>32</td>
</tr>
<tr>
<td>46</td>
<td>2</td>
<td>110</td>
<td>177</td>
<td>-67</td>
<td>25</td>
</tr>
<tr>
<td>48</td>
<td>-</td>
<td>115</td>
<td>300</td>
<td>-185</td>
<td>--</td>
</tr>
<tr>
<td>49</td>
<td>-</td>
<td>120</td>
<td>441</td>
<td>-321</td>
<td>50</td>
</tr>
<tr>
<td>Lake Cane</td>
<td>-</td>
<td>133</td>
<td>400</td>
<td>-267</td>
<td>--</td>
</tr>
</tbody>
</table>

|             |        |            |            |                | Mean                  | Deepest     | Shallowest |
|             |        |            |            |                | 368                   | 166         | 150        |
|             |        |            |            |                | -250                  | -51         | -15        |
|             |        |            |            |                | 166                   | 219         | 119        |
|             |        |            |            |                | -35                   | -109        | -4         |
|             |        |            |            |                | 85/88*               | 85/88*      | 24         |
|             |        |            |            |                | 65/62*               | 65/62*      | 24         |
|             |        |            |            |                | 24                    | 88          |
|             |        |            |            |                | 84                    |
|             |        |            |            |                | 50                    |

* Readings taken on different dates
### TABLE VI-3

**SOUTHWEST AREA WELLS - PUMPING DATA**

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Max. Pumping Test Flow (gpm)</th>
<th>Specific Capacity (gpm/ft drawdown)</th>
<th>Flow per Unit Well Circumference (gpm/in circum.)</th>
<th>Specific Capacity per Unit Well Circumference (gpm/ft drawdown-in circum.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>5.31</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>-</td>
<td>1,190/1,500*</td>
<td>71.4/73.6**</td>
<td>31.57/39.79*</td>
<td>1.89/1.95**</td>
</tr>
<tr>
<td>19</td>
<td>-</td>
<td>500</td>
<td>-</td>
<td>19.89</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>-</td>
<td>80</td>
<td>-</td>
<td>6.37</td>
<td>-</td>
</tr>
<tr>
<td>28</td>
<td>-</td>
<td>2,500</td>
<td>500/333.3**</td>
<td>49.74</td>
<td>9.96/6.64**</td>
</tr>
<tr>
<td>45</td>
<td>-</td>
<td>1,400</td>
<td>-</td>
<td>37.14</td>
<td>-</td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>240</td>
<td>-</td>
<td>9.55</td>
<td>-</td>
</tr>
<tr>
<td>46</td>
<td>2</td>
<td>40</td>
<td>-</td>
<td>3.18</td>
<td>-</td>
</tr>
<tr>
<td>48</td>
<td>-</td>
<td>75</td>
<td>-</td>
<td>3.98</td>
<td>-</td>
</tr>
<tr>
<td>49</td>
<td>-</td>
<td>1,400</td>
<td>280</td>
<td>37.14</td>
<td>7.44</td>
</tr>
<tr>
<td>Lake Cane</td>
<td>-</td>
<td>300</td>
<td>-</td>
<td>11.94</td>
<td>-</td>
</tr>
<tr>
<td>Mean</td>
<td>1/25</td>
<td>256.4</td>
<td></td>
<td>19.99</td>
<td>5.89</td>
</tr>
<tr>
<td>Highest</td>
<td>2,500</td>
<td>500</td>
<td></td>
<td>49.74</td>
<td>9.96</td>
</tr>
<tr>
<td>Lowest</td>
<td>40</td>
<td>71.4</td>
<td></td>
<td>3.98</td>
<td>1.89</td>
</tr>
</tbody>
</table>

* Conflicting data from different references. **Readings taken on different dates.
with the average being 256.4. Flow rate per unit well circumference ranged from 3.98 to 49.74 GPM per inch, with the mean being 19.99. Specific capacity per unit well circumference for the wells with data available varied from 1.89 to 9.96 GPM per foot of drawdown per inch circumference, averaging 5.89.

Table VI-4 provides chemical data for these wells. All are within the established limits for total dissolved solids and chloride. They all have hardness levels within the classifications of moderately hard or hard, with the softest being 102 mg/l and the hardest being 234 mg/l. Iron levels are generally within the established limits, with Plant No. 12 (Down Point) being at the limit and Plant 49 (Windermere Downs) being slightly over the limit at 0.4 mg/l.

Available records of bacteriological tests do not indicate histories of unsatisfactory levels of coliform bacteria in this area.

Individual data sheets for each well in the southwest area are shown on the following pages.
### TABLE VI-4

**SOUTHWEST AREA WELLS - WATER QUALITY DATA**

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Total Dissolved Solids (mg/l)</th>
<th>Total Alkalinity CaCO₃ (mg/l)</th>
<th>Total Hardness CaCO₃ (mg/l)</th>
<th>Chloride Cl (mg/l)</th>
<th>Sulfide S (mg/l)</th>
<th>Iron Fe (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>-</td>
<td>242</td>
<td>120</td>
<td>144</td>
<td>10</td>
<td>&lt; 0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>16</td>
<td>-</td>
<td>190</td>
<td>126</td>
<td>129</td>
<td>7.2</td>
<td>0.5</td>
<td>0.13</td>
</tr>
<tr>
<td>19</td>
<td>-</td>
<td>168</td>
<td>96</td>
<td>102</td>
<td>9</td>
<td>0.65</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>20</td>
<td>-</td>
<td>335</td>
<td>93</td>
<td>234</td>
<td>25</td>
<td>0.01</td>
<td>0.34</td>
</tr>
<tr>
<td>28</td>
<td>-</td>
<td>178</td>
<td>108</td>
<td>102</td>
<td>1</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>45</td>
<td>-</td>
<td>174</td>
<td>104</td>
<td>102</td>
<td>1</td>
<td>&lt; 0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>210</td>
<td>138</td>
<td>140</td>
<td>3</td>
<td>0.12</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>46</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>48</td>
<td>-</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>49</td>
<td>-</td>
<td>268</td>
<td>154</td>
<td>138</td>
<td>3</td>
<td>0.20</td>
<td>0.4</td>
</tr>
<tr>
<td>Lake Cane</td>
<td>-</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>221</td>
<td>117</td>
<td>136</td>
<td>7</td>
<td>&lt; 0.25</td>
<td>0.21</td>
</tr>
<tr>
<td>Highest</td>
<td></td>
<td>335</td>
<td>154</td>
<td>234</td>
<td>25</td>
<td>0.65</td>
<td>0.4</td>
</tr>
<tr>
<td>Lowest</td>
<td></td>
<td>168</td>
<td>93</td>
<td>102</td>
<td>1</td>
<td>0.01</td>
<td>&lt;0.1</td>
</tr>
</tbody>
</table>
Plant Name: No. 12 - Down Point

Location: 4464 Down Point Rd.; SE ¼ Sec. 9-T23S-R28E (Lat. 28°29'49" N, Long. 81°30'56" W)

Date Drilled: 4/2/69

Drilled by: Meridith Corporation

Ground Elevation: 115 ft

Drill hole diameter: Size: 6 in Depth: 200 ft

Casing Record: Size: 6 in From depth to depth: 0-119 ft

Static Water Level: 30 ft Date: 4/2/69

Well ownership history: Meridith Corporation Orange County

Well usage: Public supply

Bacteriological history: Five unsatisfactory samples 10/4/77-11/8/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 5
Serial No.: 18009685 R.P.M.: 1800
Model No.: R-2610-01-169

Pump: Manufacturer: Worthington Model No.: 6M-11
Type: Vertical turbine Number of stages: 10
Serial No.: 25395 R.P.M.: 1760
Capacity: 100 GPM @ 140 ft Efficiency: 78%
Discharge size: 3 in

Bowl: Number of bowls: 10 Size: 5½ in
Plant Name: No. 16 - Hidden Springs (also known as Marsha Park)

Location: SR 439, North of Archwood Dr.; NW¼ Sec 14-T23S-R28E
(Lat. 28°29'19" N, Long. 81°29'00" W+)

Date Drilled: 1/17/73-2/9/73
Drilled by: Meridith Corporation

Ground Elevation: 150 ft +/-

Drill hole diameter: Size: 12 in Depth: 492 ft
Casing Record: Size: 12 in From depth to depth: 0-185 ft
Type of Material: Steel

Static Water Levels and Dates:
- 88 ft 2/9/73
- 85 ft 2/15/73

Well Yield (gpm) Drawdown Specific Capacity (gpm/ft drawdown) Date
- 1190 16'8" 71.4 2/15/73
- 1190 16'2" 73.6 2/16/73

Well ownership history: Southern States Utilities
Orange County (acquired Sept. 1976)

Well usage: Public supply (back-up to Lake Cane area)

**WELL PUMP**

Motor: Manufacturer: U.S. Horsepower: 40
Type: VHS R.P.M.: 1800
Model No.: 5K6247XH4A Phase: 3

Pump: Manufacturer: Worthington Model No.: 10H-75
Type: Vertical Turbine Number of stages: 5
R.P.M.: 1760 Capacity: 750 or 1500* GPM
Impeller: 6 7/8" at 200 ft TDH
Efficiency: 83%  
Suction Size: 8 in

Bowl: Number of Bowls: 5  
Size: 9½ in

Column: Length: 120 ft  
Diameter: 8 in

Auxiliary Engine: None

* Conflicting data
Plant Name: No. 19 - Kelso-on-Lake Butler

Location: 1223 Kelso Blvd.; SE Sec 13-T23S-R27E
(Lat. 28°29'04" N, Long. 81°33'52" W)

Date Drilled: 8/27/73-9/24/73

Drilled by: Meridith Corporation

Ground Elevation: 108 ft

Drill hole diameter: Size: 8 in Depth: 420 ft

Casing Record: Size: 8 in From depth to depth: 0-185 ft

Static Water Level: 23 ft, 10 in Date: unknown

Well ownership history: Magnolia Service Corporation
Orange County (acquired 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: 50+ 1/11/77

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 30
Serial No.: MJJ1205365 Type: VHS
Model No.: 5K6238XH1B R.P.M.: 1800
Volts: 240 Amps: 76

Pump: Manufacturer: Worthington Model No.: UD4473
Type: Vertical turbine Number of stages: 5
R.P.M.: 1760 Capacity: 500 GPM @ 185 ft TDH
Suction size: 6 in

Bowl: Number of bowls: 5 Size: 7½ in Diameter: 6 in

Auxiliary Engine: Manufacturer: Ford
Plant Name: No. 20 - Lake Down

Location: Apopka-Vineland Rd., South of Ron-Den Lane; NE¼ Sec 9-T23S-R28E (Lat 28°30'09" N, Long. 81°30'23" W+)

Date Drilled: 1959

Ground Elevation: 135 ft +

Drill hole diameter: Size: 4 in Depth: 150 ft

Casing Record: Size: 4 in From depth to depth: 0-?? ft

Type of Material: Steel

Well ownership history: Southern States Utilities Orange County (acquired Sept. 1976)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 2
R.P.M.: 3600 Phase: 1

Pump: Manufacturer: Jacuzzi Type: Submersible
R.P.M.: 3400 Capacity: 80 GPM @ Unknown TDH
Plant Name: No. 28 - Orangewood

Location: 5707 Sea Harbour Dr.; NW Sec 7-T24S-R29E
(Lat. 28°25'07" N, Long. 81°27'17" W+)

Date Drilled: 11/27/72-12/9/72

Drilled by: Layne Atlantic Company

Ground Elevation: 93.67 ft

Drill hole diameter: Size: 16 in

Depth: 500 ft

Casing Record: Size: 16 in

From depth to depth: 0-150 ft

20 in

0-65 ft

Grouting: Yes

Static Water Level: 30 ft

Date: 12/9/72

Well Yield Drawdown Specific Capacity Date
(gpm) (ft) (gpm/ft drawdown) Date

2000 4 500 12/9/72

2000 6 333.3 12/13/72

Well ownership history: Florida Land Company

Orange County

Well usage: Public supply

Motor: R.P.M.: 1800

Phase: 3

Volts: 460

Pump: Manufacturer: Peerless

Model No.: 14HH

Number of stages: 2

R.P.M.: 1785

Capacity: 2500 GPM @ 75 ft TDH

Efficiency: 82%

Column Length: 51.5 ft

Auxiliary Engine: Horsepower: 125

R.P.M.: 1800
Plant Name: No. 45 - Vistana

Location: 13200 Vistana Blvd.; SW 4 Sec 27-T24S-R28E (Lat. 28°22'02" N, Long. 81°30'28" W+)

Date Drilled: 3/28/72-4/21/72

Drilled by: Meridith Corporation

Type of drilling: Cable-tool

Ground Elevation: 111 ft +

Drill hole diameter: Size: 12 in Depth: 580 ft

Casing Record: Size: 12 in From depth to depth: 0-166'5"

Static Water Level: 26 ft Date: 4/21/72

Well ownership history: Vistana, Inc. Orange County

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +26 8/9/77  
+12 8/10/77  
+10 8/11/77

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 40

Pump: Manufacturer: Worthington Model No.: 12HH165-2

Type: Vertical turbines Number of stages: 2

Capacity: 1400 GPM @ 90 ft TDH
Plant Name: No. 46 - Wauseon Ridge

Well Number: 1

Location: 4124 Wauseon Dr.; NE\(^4\) Sec 7-T23S-R28E (Lat. 28° 30' 16" N, Long. 81° 32' 44" W+)

Date Drilled: 7/31/68-8/15/68

Drilled by: Meridith Corporation

Ground Elevation: 110 ft ±

Drill hole diameter: Size: 8 in Depth: 388 ft

Casing Record: Size: 8 in From depth to depth: 0-219 ft

Static Water Level: 32 ft Date: 8/15/68

Well ownership history: Southern Gulf Utilities Orange County (acquired July, 1975)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15

Serial No.: 1004008 Type: HU-NRR

R.P.M.: 1800 Model No.: R-1761-01-268

Phase: 3 Volts: 220/440

Amps: 40/20 Type of bearings: Upper - 1-62075, Lower - 1-731084

Pump: Manufacturer: Peerless Model No.: 8LB6

Type: OLS Vertical turbine Serial No.: TA2870

R.P.M.: 1760 Capacity: 240 GPM @ 198 Ft TDH
Plant Name: No. 46 - Wauseon Ridge

Well Number: 2

Location: 4124 Wauseon Dr.; NE¼ Sec 7-T23S-R28E (Lat. 28°30'16" N, Long. 81°32'44" W+)

Date Drilled: 1959

Ground Elevation: 110 ft +

Drill hole diameter: Size: 4 in Depth: 177 ft

Casing Record: Size: 4 in From depth to depth: 0-131 ft

Static Water Level: 25 ft Date: Unknown

Well ownership history: Southern Gulf Utilities Orange County (acquired, July 1975)

Well usage: no longer in service

**WELL PUMP**

Motor: Manufacturer: U.S. Horsepower: 3

Serial No.: 2640119 Type: VHS

R.P.M.: 3600 Phase: 1

Pump: Manufacturer: Peerless Model No.: 121892

Serial No.: TA2870 R.P.M.: 3600

Capacity: 40 GPM @ 198 ft TDH

Auxiliary Engine: None
Plant Name: No. 48 - Windermere
Location: Magnolia St. and Third St.; SE¼ Sec 8-T23S-R28E
          (Lat. 28°29'53" N, Long. 81°32'03" W)
Date Drilled: 1961
Ground Elevation: 115 +
Drill hole diameter: Size: 6 in        Depth: 300 ft
Casing Record: Size: 6 in        From depth to depth: 0-?? ft
Type of Material: Steel
Well ownership history: Southern States Utilities
                       Orange County (acquired Sept., 1976)
Well usage: Public supply
Bacteriological history: 10 unsatisfactory samples: 3/8/77-10/10/77

WELL PUMP
Motor: Manufacturer: U.S.        Horsepower: 5
Serial No.: 3162075               Type: VHS
R.P.M.: 1800                     Phase: 3
Pump: Manufacturer: Jacuzzi       Type: Vertical turbine
R.P.M.: 1800                     Capacity: 75 GPM @ Unknown TDH
Plant Name: No. 49 - Windermere Downs

Location: 1600 Woody Dr.; NE ¼ Sec 5-T23S-R28E (Lat. 28°31'05"N, Long. 81°31'36"W+)

Date Drilled: 3/21/72-4/6/72

Drilled by: Locke Well and Pump Company

Type of drilling: Cable-tool

Ground Elevation: 120 ft +

Drill hole diameter: Size: 12 in   Depth: 441 ft

Casing Record: Size: 12 in   From depth to depth: 0-173 ft

Static Water Level: 50 ft   Date: 4/6/72

Well Yield (gpm) Drawdown (ft) Specific Capacity (gpm/ft drawdown) Date

1400 5 280 4/6/72

Well ownership history: Meridith Corporation
Orange County

Well usage: Public supply

Bacteriological History: 4 unsatisfactory samples: 1/12/77-3/8/77

WELL PUMP

Motor: Manufacturer: U.S.   Horsepower: 60

Serial No.: R-2841-01-H-887   Type: VHS

R.P.M.: 1800   Phase: 3

Volts: 230/460   Amps: 144/72

Type of bearings: Upper 7220M   Lower 6211J

Pump: Manufacturer: Berkeley   Type: Vertical turbine

R.P.M.: 1770   Capacity: 1200 GPM @ 230 ft TDH
Bowl Column Length: 70 ft

Auxiliary Engine: Manufacturer: Hercules
Model No.: HXEER Serial No.: 353565
Type: LP Gas
Plant Name: Lake Cane (plant not in service)

Location: South of Lake Marsha Rd.; West of Turkey Lake Rd.
SE 6 Sec 14-T23S-R28E (Lat. 28°28′55″ N, Long. 81°28′45″W)

Date Drilled: 1959

Ground elevation: 133 ft ±

Drill hole diameter: Size: 8 in       Depth: 400 ft

Casing Record: Size: 8 in From depth to depth: 0-?? ft

Type of Material: Steel

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 30
Serial No.: 2663091 Type: C.F.U.
R.P.M.: 1800 Phase: 3
Volts: 220/440 Amps: 50/25
Type of bearings: Upper - 7220 Lower - 6212

Pump: Manufacturer: U.S. Model No.: 2484
Type: Vertical turbine
R.P.M.: 1760
Capacity: 300 GPM @ Unknown TDH

Well usage: no longer in service
CHAPTER VII
WEST AREA WELLS

There are nineteen water treatment plants in the west area, fifteen of which are active. At these plants, there are twenty-two wells presently in service and ten wells which are not. The area is bounded by Oranole Road (the Orange-Seminole County line) and Keene Road on the north, Forest City Road and John Young Parkway on the east, Old Winter Garden Road and Sunshine State Parkway on the south, and Lake Apopka on the west. These treatment plants are listed in Table VII-1 and their locations are shown in Figure VII-1.

Table VII-2 shows elevation and depth data for each well, the well's casing pipe, and its static water level. Most of these wells appear to penetrate the upper level of the Floridan Aquifer. Four of these, two at Plant 50 (Woodsmere Manor) and two at inactive Ridge Manor have depths generally considered less than the depth to the beginning of the Floridan Aquifer (150 feet below ground surface). The shallowest of these is 100 feet deep. Each of these wells has casing pipe installed to depths of approximately 75 to 80 feet, which would indicate the groundwater aquifer has been cased out to avoid any pollutant from this level reaching
### TABLE VII-1
ORANGE COUNTY WELLS LOCATED IN WEST AREA

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<td>38</td>
<td>Riverside Park Estates (formerly Riverside Park)</td>
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<td>50</td>
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<td>Inactive</td>
<td>Long Lake</td>
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<td>Ridge Manor</td>
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Fig. VII-1. Location map for west area wells.
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<th>Plant No.</th>
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<th>Well Depth (ft)</th>
<th>Casing Depth (ft)</th>
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* Conflicting data from different references
** Readings taken on different dates
the potable water source. It would appear that these four wells penetrate a shallow artesian aquifer located between the non-artesian aquifer and the Floridan Aquifer.

The deepest well in this area is 609 feet below the ground surface. The mean depth is 316 feet. Casing pipe depths average 138 feet, with the deepest being 447 feet and the shallowest 63 feet. Static water level depths at the time of measurement ranged from 15 to 75 feet below ground surface, with the mean being 42 feet. Comparing these static water levels to contours shown on U.S.G.S. piezometric surface level maps show reasonable agreement in all cases except Plant No. 24 (Magnolia Woods). The values recorded of 43 and 25 feet MSL (52 and 70 feet below ground surface, respectively) on unknown dates are far below the lowest elevation shown on a U.S.G.S. map of 63 feet in May, 1974. The values shown with the data sheets appear to be erroneous.

Table VII-3 indicates pumping data from each well. Tested pumping rates in this area ranged from a low of 20 GPM to a high of 3100 GPM, with the mean being 431. Available data from the wells indicate specific capacity varies from 40.0 to 6200.0 GPM per foot of drawdown, averaging 1096.7. Flow per unit well circumference has a mean value of 14.93 GPM per inch, with a range of 1.06 to 63.66. Specific capacity per unit well circumference ranges from 1.66 to 123.36 GPM per foot of drawdown per inch circumference, with an average value of 22.87.
### TABLE VII-3

**WEST AREA WELLS - PUMPING DATA**

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<th>Plant No.</th>
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<th>Max. Pumping Test Flow (gpm)</th>
<th>Specific Capacity (gpm/ft drawdown)</th>
<th>Flow per Unit Well Circumference (gpm/in circum.)</th>
<th>Specific Capacity per Unit Well Circumference (gpm/ft drawdown-in circum.)</th>
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TABLE VII-3 (Continued)

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<th>Flow per Unit Well Circumference (gpm/in circum.)</th>
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* Conflicting data from different references.
Table VII-4 gives chemical data for the wells in the west area. All wells are within the established limits for total dissolved solids and chloride. All are within the hardness classifications of either moderately hard or hard, with two of the wells having values less than 100 mg/l. Iron levels are well above the limits for both wells at Plant No. 30 (Partlow Acres) and for Well No. 1 at Plant No. 50 (Woodsmere Manor). Well No. 2 at Plant No. 50 did not have chemical data available.

Bacteriological test results indicate past unsatisfactory levels of coliform bacteria in Well No. 1 at Plant No. 6 (Clearview Heights) and in Well No. 1 at Plant No. 25 (Meadowbrook Annex). The unsatisfactory results at Clearview Heights occurred during the period immediately after replacing the well pump. According to the Orange County Sewer and Water Department, the well was not disinfected properly during the replacement process. After many unsatisfactory results, the pump was removed, the well re-disinfected, the pump reinstalled, and the well cleared. Well No. 1 at Meadowbrook Annex has a continuous bacteriological problem. There are ten drainage wells of approximately 150 feet depth within a 1½ mile radius. The Meadowbrook Annex well is cased to 65 feet and has a total depth of 225 feet. When it was drilled, a water bearing cavity was penetrated at the 120 feet level. Each year after commencement of the wet season, the unsatisfactory bacteriological samples begin to occur. It is the feeling of the
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<th>Total Hardness CaCO₃ (mg/l)</th>
<th>Chloride Cl⁻ (mg/l)</th>
<th>Sulfide S⁻ (mg/l)</th>
<th>Iron Fe (mg/l)</th>
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<td>Total Alkalinity CaCO₃ (mg/l)</td>
<td>Total Hardness CaCO₃ (mg/l)</td>
<td>Chloride Cl⁻ (mg/l)</td>
<td>Sulfide S⁻ (mg/l)</td>
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Orange County Sewer and Water Department that the source of the pollution is the drainage wells (Stewart, 1981).

Individual data sheets for each of the west area wells are included in the following pages.
Plant Name: No. 5 - Clarcona Heights

Location: Metro Dr. at Shubert St.; NE\(^{1/4}\) Sec 3-T22S-R28E
(Lat. 28\(^{0}\)36'34" N, Long. 81\(^{0}\)30'02" W)

Date Drilled: 1/19/70-1/27/70

Drilled by: Meridith Corporation

Ground elevation: 102 ft

Drill hole diameter: Size: 8 in

Casing Record: Size: 8 in

Type of Material: Steel

Static Water Level: 35 ft

Well Yield (gpm) 400

Drawdown (ft) 10

Specific Capacity (gpm/ft drawdown) 40

Date: 1/27/70

Well ownership history: Southern States Utilities
Orange County (acquired Sept. 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample - +10 2/9/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 30

Serial No.: R2013316 Type: VHS

R.P.M.: 1800 Phase: 3

Pump: Manufacturer: Worthington Model No.: 8H-4B

Type: Vertical turbine Number of stages: 4

Serial No.: VTP 27160 R.P.M.: 1760

Capacity: 300 GPM @ 112 ft TDH
Impeller Diameter: 5-5/16 in
Suction Size: 6 in

Bowl: Number of Bowls: 4
Column Diameter: 6 in

Efficiency: 67.5%
Discharge size: 8 in

Size: 7½ in
Plant Name: No. 6 - Clearview Heights

Well Number: 1

Location: 7130 Hardwick Dr.; SE 1/4 Sec 35 T21S-R28E
(Lat. 28°36'37" N, Long. 81°28'53" W)

Drilled by: Central Florida Well Drillers

Ground Elevation: 110 ft

Drill hole diameter: Size: 10 in  Depth: 358 ft

Casing Record: Size: 10 in  From depth to depth: 0-80 ft
(liner) 8 in  0-118.5 ft

Type of material: 10 in: Unknown
(liner): Steel

Static Water Level: 48 ft  Date: 11/27/73

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

Bacteriological history: 14 unsatisfactory samples: 5/12/77-10/4/77

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 25
Serial No.: R-3377-02-C-073  R.P.M.: 3600
Phase: 3  Volts: 230

Pump: Manufacturer: Berkeley  Model No.: 803-H2
Type: Vertical turbine  Number of stages: 1
Serial No.: 2099  R.P.M.: 3450

Capacity: 500 GPM @ Unknown TDH
Bowl: Model No.: 803  Number of bowls: 1
Column: Length: 80 ft  Diameter: 5 in
Plant Name: No. 6 - Clearview Heights

Well Number: 2

Location: 7130 Hardwick Dr.; SE½ Sec 35-T21S-R28E
(Lat. 28°36'37" N, Long. 81°28'53" W)

Date Drilled: 4/18/60

Drilled by: Central Florida Well Drillers

Ground Elevation: 110 ft

Drill hole diameter: Size: 6 in Depth: 250 ft

Casing Record: Size: 6 in From depth to depth: 0-129'10"

Type of material: Steel Wall thickness: 0.280 in

Static Water Level: 36 ft Date: 4/60

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15
Serial No.: 1-62021 R.P.M.: 3600
Phase: 3

Pump: Manufacturer: Sta-Rite R.P.M.: 3450
Capacity: 300 GPM @ Unknown TDH
Plant Name: No. 6 - Clearview Heights

Well Number: 3

Location: 7130 Hardwick Dr.; SE 1/4 Sec 35-T21S-R28E
(Lat. 28°36'37" N, Long. 81°28'53" W)

Date Drilled: 11/62

Drilled by: Central Florida Well Drillers

Ground elevation: 110 ft

Drill hole diameter: Size: 4 in Depth: 215 ft

Casing Record: Size: 4 in From depth to depth: 0-71'8"

Type of material: Steel Wall thickness: 0.237 in

Static Water Level: 46 ft Date: 11/62

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply (standby only)

**WELL PUMP**

Motor: Manufacturer: U.S. Horsepower: 5 or 7.5*
R.P.M.: 3600 Phase: 3

Pump: Manufacturer: Layne-Bowler R.P.M.: 3450
Capacity: 150 GPM @ Unknown TDH

* Conflicting data
Plant Name: No. 11 - Crescent Hills

Location: Buena Vista Ave., North of Robinson St. NW, Sec 25-T22S-R28E (Lat. 28°32'43" N, Long. 81°28'09"W)

Date Drilled: 1/10/59

Drilled by: Meridith Corporation

Ground Elevation: 142 ft

Drill hole diameter: Size: .8 in    Depth: 405 ft

Casing Record: Size: 8 in    From depth to depth: 0-131 ft

Type of material: Steel

Static Water Level: 60 ft    Date: 1/10/59

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +3 10/6/77
                                +5 10/10/77
                                +2 10/12/77

WELL PUMP

Motor: Manufacturer: U.S.    Horsepower: 15

Serial No.: 1169176    R.P.M.; 1800    Phase: 3

Pump: Manufacturer: U.S.    Model No.: 25081

R.P.M.: 1800    Capacity: 300 GPM @ Unknown TDH
Plant Name: No. 21 - Lake John Shores

Location: 1156 S. Fourth St.; Winter Garden
NE½ Sec 29-T22S-R27E

Ground elevation: 120 ft +

Drill hole diameter: Size: 6 in Depth: 285 ft

Casing Record: Size: 6 in From depth to depth: 0-63 ft

Type of material: Steel

Static Water Level: 36 ft Date: Unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: +2 2/9/77

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 1.5
Serial No.: 5KC4976325A

Pump: Manufacturer: Jacuzzi Model No.: 3VRG
Type: Jet Capacity: 20 GPM @ Unknown TDH

Auxiliary Engine: None
Plant Name: No. 22 - Lake Lawne

Location: Carlsbed Pl.; South of Lake Lawne Ave.
SE$^4$ Sec 20-T22S-R29E (Lat. 28°33'31" N, Long. 81°25'57" W)

Date Drilled: 9/3/57

Drilled by: Meridith Corporation

Ground elevation: 96 ft

Drill hole diameter: Size: 8 in  Depth: 520 or 525 ft*

Casing Record: Size: 10 in  From depth to depth: 0-76'2" total length-162'8"
8 in  168-447'
6 in

Static Water Level: 31 ft  Date: 9/3/57

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: Public supply

**WELL PUMP**

Motor: Manufacturer: U.S.  Horsepower: 30
Serial No.: 3132951  Type: VHS

R.P.M.: 1800

Pump: Manufacturer: Jacuzzi  Type: Vertical turbine

Number of stages: 8  R.P.M.: 1800

Capacity: 350 or 500 GPM @ 208 ft TDH*

Bowl column length: 80 ft

* Conflicting data
Plant Name: No. 24 - Magnolia Woods

Location: 105 Markel Dr., Winter Garden; SE \% Sec. 11-T22S-R27E (Lat. 28°35'15" N, Long. 81°34'30" W+)

Date Drilled: Unknown, reworked 3/62

Drilled by: Unknown, reworked by Central Florida Well Drillers

Ground elevation: 95 ft +

Drill hole diameter: Size: 6 in 4 in Depth: 0 - 250 ft 250 - 331 ft

Casing Record: Size: 6 in 4 in From depth to depth: 0-146 ft 0-231 ft

Type of Material: Steel

Static Water Level and Dates: 70 ft unknown 52 ft unknown

Well ownership history: Southern Gulf Utilities Orange County (acquired July, 1975)

Well usage: Public supply

Bacteriological history: 7 unsatisfactory samples: 7/6/77-12/7/77

WELL PUMP

Motor: Manufacturer: Franklin Horsepower: 3

Serial No.: 7706720B Type: 57S

R.P.M.: 3600 Volts: 230

Amps: 20

Pump: Manufacturer: Reda Model No.: 48091

Type: Submersible 9D-52TA Number of stages: 9
Serial No: 6720-R  
R.P.M.: 3400  
Capacity: 50 or 30* GPM @ 155 ft TDH  
Auxiliary Engine: None  

* Conflicting Data
Plant Name: No. 25 - Meadowbrook Annex (Formerly Meadowbrook)

Well Number: 1

Location: North Lane, west of Debord Ave.; SE¼ Sec 1-T22S-R28E
(Lat. 28°35'47" N, Long 81°27'39" W)

Date Drilled: 5/29/59

Drilled by: Meridith Corporation

Ground elevation: 75 ft

Drill hole diameter: Size: 12 in. Depth: 225 ft

Casing Record: Size: 12 in From depth to depth: 0-64'6"

Type of material: Steel

Static Water Level: 15 ft Date: 5/29/59

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: 43 unsatisfactory samples: 3/8/77-12/29/77

WELL PUMP

Motor: Manufacturer: US Horsepower: 75
Type: VHS R.P.M.: 1800
Model No.: R-248-01-270-D Phase: 3 Volts: 460

Pump: Manufacturer: Jacuzzi Model No.: 12H-64
Type: Vertical turbine Number of stages: 2
R.P.M.: 1760 Capacity: 1000 GPM @ 135 ft TDH
Impeller No.: 2953 - Bronze
Bowl: Model No.: 2915-S  Number of bowls: 2
Type: 12 HS  Size: 11¼ in
Bowl material: Cast iron enamel
Plant Name: No. 25 - Meadowbrook Annex (formerly Meadowbrook)

Well Number: 2

Location: North Lane, West of Debord Ave.; NE ¼ Sec 12-T22S-R28E
(Lat. 28°35'45" N, Long 81°27'39" W)

Date Drilled: 11/24/75-12/23/75

Drilled by: Meridith Corporation

Ground Elevation: 77 ft

Drill hole diameter: 16 in.

Drill hole depth: 595 ft

Casing Record: Size: 16 in

Type of material: Iron

Static Water Level: 21'4" Date: 12/23/75

Well Yield (gpm) Drawdown (ft) Specific Capacity (gpm/ft drawdown) Date

3100 0.5 6200 12/23/75

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 100

Pump: Manufacturer: Byron Jackson Model No.: 13" MQ-H
Size: 13 in Type: Vertical turbine
Number of stages: 3 Serial No.: 771E0154
R.P.M.: 1770
Impeller Diameter: 9-1/8"
Bowl: Number of bowls: 3
Column length: 63 ft
Capacity: 1450 GPM @ 228 ft TDH
Efficiency: 83.5%
Size: 13 in
Diameter: 10 in
Plant Name: No. 27 - Oak Meadows

Location: 226 Dorsher Rd.; SE 1/4 Sec 26-T22S-R28E (Lat. 28°32'34"N, Long. 81°28'47"W)

Date Drilled: 4/16/74-5/30/74

Drilled by: Locke Well and Pump Company

Type of Drilling: Cable-tool

Ground elevation: 100 ft +

Drill hole diameter: Size: 12 in, Depth: 609 ft

Casing Record: Size: 12 in, From depth to depth: 0-370'4"

Type of material: Steel

Static Water Level: 35 ft, Date: 6/11/74

Well Yield (gpm) Drawdown (ft) Specific Capacity (gpm/ft drawdown) Date

2400 25 96 unknown

Well ownership history: Republic Service Corporation Orange County

Well usage: Public supply

Bacteriological history: 7 unsatisfactory samples: 3/8/77-10/10/77

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 50

Serial No.: FKJ612478

R.P.M.: 1800

Phase: 3

Amps: 120/60

Model No.: 5K6248XH4A

Volts: 230/460

Type of bearings: upper thrust-629A21761, tower guide-590349P12
Pump: Manufacturer: Peerless
Type: Vertical turbine
Serial No.: T110698
Capacity: 1500 GPM @ 80 ft TDH

Bowl: Model No.: 12HXB
Column: Length: 70 ft

Auxiliary Engine: None

Model No.: 12HXB-2
Number of stages: 2
R.P.M.: 1760
Impeller No.: 2608368E
Number of bowls: 2
Diameter: 10 in
Plant Name: No. 30 - Partlow Acres
Well Number: 1

Location: 1120 Partlow Dr.; NW¼ Sec 25-T22S-R27E (Lat. 28°32'54"N, Long. 81°34'09"W+)
Date Drilled: 2/10/64
Drilled by: Central Florida Well Drillers

Ground Elevation: 121 ft+
Drill hole diameter: Size: 4 in Depth: 190 ft
Casing Record: Size: 4 in From depth to depth: 0-100 ft
Type of material: Steel
Static Water Level: 45 ft Date: Unknown
Well ownership history: Central Florida Utilities Orange County (acquired 1977)
Well usage: Public supply

WELL PUMP

Motor: Manufacturer: Myers Horsepower: 2
Phase: 3 R.P.M.: 3600
Pump: Manufacturer: Myers Type: Submersible
R.P.M.: 3450 Capacity: 100 GPM @ Unknown TDH
Plant Name: No. 30 - Partlow Acres

Well Number: 2

Location: 1120 Partlow Dr.; NW 1/4 Sec 25-T22S-R27E (Lat. 28°32'54"N, Long. 81°34'09"W+)

Date Drilled: 1958

Drilled by: Jack Meridith

Ground elevation: 121 ft+

Drill hole diameter: Size: 4 in  Depth: 275 ft

Casing Record: Size: 4 in  From depth to depth: 0-127'7"

Type of material: Steel

Static Water Level: 53 ft  Date: Unknown

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 2

Phase: 3

Pump: Manufacturer: Sta-Rite  Model No.: A-203

Type: Vertical turbine  Capacity: 75 GPM @ Unknown TDH
Plant Name: No. 34 - Ramir

Location: Bywood Rd. and Caywood Circle, SE Sec 32-T21S-R29E (Lat. 28°36'58" N, Long. 81°25'48" W)

Date Drilled: 9/22/58

Drilled by: M.K. Belmany

Ground elevation: 102 ft

Drill hole diameter: Size: 6 in Depth: 302 ft

Casing Record: Size: 6 in From depth to depth: 0-97 ft

Type of material: Steel

Static Water Level: 44 ft Date: Unknown

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: 4 unsatisfactory samples: 6/8/77-9/8/77

WELL PUMP

Motor: Horsepower: 7.5

Pump: Manufacturer: Redi Type: Submersible

Capacity: 200 GPM @ 105 ft TDH
Plant Name: No. 35 - Rimar Ridge (formerly Rimar and Ranchette)

Well Number: Rimar

Location: Mustang Way, West of Paladin Way; SE¼ Sec 31-T21S-R29E (Lat. 28°36'58" N, Long. 81°25'48" W)

Date Drilled: 1957

Ground elevation: 80 ft

Drill hole diameter: Size: 6 in Depth: 200 ft

Casing Record: Size: 6 in From depth to depth: 0-?? ft

Type of material: Steel

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: +16 7/7/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 7.5, 10 or 15*

Serial No.: 437016 Type: VHS

R.P.M.: 3600 Phase: 3

Volts: 230/460

Pump: Manufacturer: Deming Model No.: T-11119

Type: Vertical turbine R.P.M.: 3500

Capacity: 150* GPM @ Unknown TDH

250 GPM @ 180 ft TDH

300 GPM @ 158 ft TDH

Bowl: Model No.: 6XSA3 Column length: 80 ft

* Conflicting data
Plant Name: No. 35 - Rimar Ridge (formerly Rimar and Ranchette)

Well Number: Ranchette

Location: Brahma Ave., north of Pinto Lane; SE¼ Sec 31-T21S-R29E

Ground elevation: 90 ft+ Date Drilled: 1958

Drill hole diameter: Size: 8 in Depth: 400 ft
Casing Record: Size: 8 in From depth to depth: 0-unknown

Type of material: Steel

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15
Serial No.: 2717900 Type: VHS
R.P.M.: 1800 Phase: 3

Pump: Manufacturer: Worthington Model No.: GM11
Size: 6 in Type: Vertical turbine
Number of stages: 3 R.P.M.: 1750

Capacity: 250 GPM @ Unknown TDH

Bowl: Number of bowls: 3 Size: 6 in
Column: Length: 90 ft Diameter: 4½ in
Plant Name: No. 37 - Riverside Acres

Well Number: 1

Location: 3323 Callaway Dr.; NW 4th Sec 28-T21S-R29E
(Lat. 28°38'09" N, Long. 81°25'18" W)

Date Drilled: 1956 or 1969*

Drilled by: Layne Atlantic

Ground elevation: 77 ft

Drill hole diameter: Size: 8 in Depth: 571 ft

Casing Record: Size: 8 in From depth to depth: 0-233 ft

Static Water Level: 30 ft Date: Unknown

Well Yield (gpm) Drawdown (ft) Date
600 Unknown Unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 25

Serial No.: 2991035 Type: VHS

R.P.M.: 1800 Phase: 3

Volts: 220/440 Amps: 64/32

Type of bearings: Upper: 1-7220 M Lower: 1-6211J

Pump: Manufacturer: Layne & Bowler Model No.: 8FHH

Serial No.: D03486 R.P.M.: 1750

Capacity: 800 GPM @ 135 ft TDH
Auxiliary Engine: Wisconsin

Model No.: VG4D

Type: Gasoline

Serial No.: 3076630

Horsepower: 25+

* Conflicting Data
Plant Name: No. 37 - Riverside Acres

Well Number: 2

Location: 3323 Callaway Dr.; NW¼ Sec 28-T21S-R29E
   (Lat. 28°38'09" N, Long 81°25'18" W)

Date Drilled: 4/17/72-4/20/72

Drilled by: Central Florida Well Drillers

Ground elevation: 79 ft

Drill hole diameter: Size: 4 in  Depth: 200 ft

Casing Record: Size: 4 in  From depth to depth: 0-105 ft

Type of material: Black iron  Wall thickness: 0.237 in

Static Water Level: 30 ft  Date: 7/6/72

Well ownership history: Southern Gulf Utilities
   Orange County (acquired July, 1975)

Well usage: No longer in service (well capped)
Plant Name: No. 37 - Riverside Acres

Well Number: 3 (Riverside - tied into Riverside Alres)

Location: Callaway Rd., west of Forest City Road; NW¼ Sec 28 T21S-R29E (Lat. 28°38'06" N, Long. 81°25'24" W)

Ground elevation: 83 ft

Drill hole diameter: Size: 10 in Depth: 364 ft

Casing Record: Size: 10 in From depth to depth: 0-140 ft

Static Water Level: 35 ft Date: 10/12/77

Well ownership history: Orange County

Well usage: Former orange grove irrigation well, now public supply
Plant Name: No. 38 - Riverside Park Estates (formerly Riverside Park)

Well Number: 1

Location: Wallington Dr.; west of Courtney St.; NE\textfrac{1}{4} Sec 33-
T21S-R29E (Lat. 28°37'07" N, Long. 81°25'09" W)

Date Drilled: 1959

Drilled by: Meridith Corporation

Ground elevation: 87 ft

Drill hole diameter: Size: 6 in Depth: 350 ft

Casing Record: Size: 6 in From depth to depth: 0-?? ft

Type of material: Steel

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: no longer in service
Plant Name: No. 38 - Riverside Park Estates

Well Number: 2

Location: Wallington Dr., west of Courtney St., NE¼ Sec 33 T21S-R29E (Lat. 28°37'07" N, Long. 81°25'09" W)

Date Drilled: 8/17/70

Drilled by: Meridith Corporation

Ground elevation: 87 ft

Drill hole diameter: Size: 8 in Depth: 363 ft

Casing Record: Size: 8 in From depth to depth: 0-128 ft

Type of material: Steel

Well Yield (gpm) Drawdown (ft) Specific Capacity (gpm/ft drawdown) Date

500 5 100 Unknown

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15

Type: VHS R.P.M.: 1800

Model No.: R1761-01-170 Phase: 3

Pump: Type: Vertical turbine R.P.M.: 1745

Capacity: 300 GPM @ Unknown TDH
Plant Name: No. 44 - Vanguard Heights

Well Number: 1

Location: 1498 Division Ave.; Winter Garden
NE¼ Sec 29-T22S-R28E (Lat. 28°32'45"N, Long. 81°31'31"W+)

Ground elevation: 140 ft +

Drill hole diameter: Size: 4 in  Depth: 225 ft

Casing Record: Size: 4 in  From depth to depth: 0-106 ft

Static Water Level: 60 ft  Date: 1968

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: no longer in service

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 5
Serial No.: 3389559  Type: VHS
R.P.M.: 3600  Model: CP4J02
Phase: 1  Volts: 230  Amps: 28.6

Pump: Manufacturer: Jacuzzi  Model No.: M4T216
Type: Vertical turbine  Number of stages: 12
R.P.M.: 3450  Capacity: 45 GPM @ 225 ft TDH
Impeller No.: 3607  Efficiency: 58%

Bowl: Model No.: 3031  Number of bowls: 12
Size: 3-5/8 in  Bowl material: Cast iron

Auxiliary Engine: None
Plant Name: No. 44 - Vanguard Heights

Well Number: 2

Location: 1498 Division Ave., Winter Garden, NE ¼ Sec. 29-T22S-R28E (Lat. 28°32'45" N, Long 81°31'31" W+)

Date Drilled: 4/26/76-5/10/76
Drilled by: Locke Well and Pump Company

Type of drilling: Cable-tool

Ground elevation: 140 ft+

Drill hole diameter: Size: 8 in Depth: 450 ft

Casing Record: Size: 8 in From depth to depth: 0-252'3"

Type of Material: Steel

Static Water Level: 75 ft Date: 5/10/76

<table>
<thead>
<tr>
<th>Well Yield (gpm)</th>
<th>Drawdown (ft)</th>
<th>Specific Capacity (gpm/ft drawdown)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>5</td>
<td>100</td>
<td>5/7/76</td>
</tr>
</tbody>
</table>

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: Public supply

WELL PUMP

Pump: Capacity: 500 GPM @ Unknown TDH
Plant Name: No. 50 - Woodsmere Manor

Well Number: 1

Location: 3590 Apopka-Vineland Rd.; SE¼ Sec 10-T22S-R28E
(Lat. 28°35'03" N, Long. 81°29'51" W)

Date Drilled: 1958

Drilled by: Central Florida Well Drillers

Ground elevation: 90 ft

Drill hole diameter: Size: 6 in

Depth: 110 ft

Casing Record: Size: 6 in

From depth to depth: 0-78'10"

Type of material: Steel

Wall thickness: 0.280 in

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

Bacteriological history: Unsatisfactory sample: +7 1/12/77
+8 8/1/77

WELL PUMP

Motor: Manufacturer: A.O. Smith Horsepower: 5

R.P.M.: 3600 Phase: 3

Pump: Manufacturer: Berkley R.P.M.: 3450

Capacity: 100 GPM @ Unknown TDH
Plant Name: No. 50 - Woodsmere Manor

Well Number: 2

Location: 3590 Apopka-Vineland Rd.; SE 1/4 Sec 10-T22S-R28E
(Lat. 28°35'03" N, Long. 81°29'51" W)

Date Drilled: 1958

Drilled by: Central Florida Well Drillers

Ground elevation: 90 ft

Drill hole diameter: Size: 4 in Depth: 107 ft

Casing Record: Size: 4 in From depth to depth: 0-79'10"

Type of material: Steel Wall thickness: 0.237 in

Well ownership history: Central Florida Utilities
Orange County (acquired 1977)

Well usage: Public supply

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 3
R.P.M.: 3600 Phase: 3

Pump: Manufacturer: Berkley R.P.M.: 3450
Capacity: 75 GPM @ Unknown TDH
Plant Name: Long Lake (Plant not in service)

Well Number: 1

Location: Beggs Rd. and Aldot Lane; NE Sec 36-T21S-R28E
(Lat. 28°37'29" N, Long. 81°27'37" W)

Date Drilled: 9/30/58

Drilled by: Meridith Corporation

Ground elevation: 100 ft

Drill hole diameter: Size: 8 in Depth: 400 ft

Casing Record: Size: 8 in From depth to depth: 0-125'10"

Type of material: Steel

Static Water Level: 47 ft Date: 9/30/58

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15

Type: VHS R.P.M.: 1800

Model No.: 2761211 Phase: 3

Pump: Manufacturer: Jacuzzi Model No.: 8MCA7T207

Type: Vertical turbine R.P.M.: 1800

Capacity: 250 GPM @ Unknown TDH
Plant Name: Long Lake (Plant not in service)

Well Number: 2

Location: Beggs Rd. and Aldot Lane; NE Sec 36-T21S-R28E (Lat. 28°37'29" N, Long. 81°27'37" W)

Date Drilled: 1960

Ground elevation: 100 ft

Drill hole diameter: Size: 4 in Depth: 177 ft

Casing Record: Size: 4 in From depth to depth: 0-74 ft

Type of material: Steel Wall thickness: 0.237 in

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 5

Type: Solid shaft R.P.M.: 3600

Model No.: SKC215EG3 Phase: 3

Pump: Manufacturer: Jacuzzi Type: Jet

R.P.M.: 3450 Capacity: 80 GPM @ Unknown TDH
Plant Name: Ridge Manor (plant not in service)

Well Number: 1

Location: Indian Wood Rd.; Southside Indian Hills Rd. SE\(^4\) Sec 12-T22S-R28E (Lat 28°35'18" N, Long. 81°27'43" W)

Date Drilled: 1/19/59-1/21/59

Drilled by: Central Florida Well Drillers

Ground elevation: 95 ft

Drill hole diameter: Size: 6 in Depth: 100 ft

Casing Record: Size: 6 in From depth to depth: 0-73 ft

Type of material: Steel Wall thickness: 0.280 in

Static Water Level: 25 ft Date: 1/21/59

Well ownership history: Central Florida Utilities Orange County (acquired 1977)

Well usage: No longer in service

### WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 10

Serial No.: 3499717 R.P.M.: 3600

Phase: 3

Pump: Manufacturer: Sta-Rite Type: Vertical turbine

Model No.: 6HOM25TAG Serial No.: 0110432

R.P.M.: 3450 Capacity: 200 GPM @ Unknown TDH
Plant Name: Ridge Manor (Plant not in service)
Well Number: 2
Location: Indian Woods Rd.; Southside Indian Hills Rd.; SE ¼ Sec 12-T22S-R28E (Lat. 28°35'18" N, Long. 81°27'43" W)
Date Drilled: 1960
Drilled by: Central Florida Well Drillers
Ground elevation: 95 ft
Drill hole diameter: Size: 6 in Depth: 105 ft
Casing Record: Size: 6 in From depth to depth: 0-73 ft
Type of material: Steel Wall Thickness: 0.280 in
Well ownership history: Central Florida Utilities
Orange County (acquired 1977)
Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 7.5
Serial No.: 3060901 R.P.M.: 3600
Phase: 3

Pump: Manufacturer: Sta-Rite Type: Vertical turbine
R.P.M.: 3450 Capacity: 100 GPM @ Unknown TDH
Plant Name: Siesta Hills (plant not in service)

Location: Powers Dr. and Aladdin Dr.; NW\% Sec 1-T22S-R28E
(Lat. 28°36'36" N, Long. 81°28'19" W)

Date Drilled: 5/6/66-5/11/66

Drilled by: Meridith Corporation

Ground elevation: 98 ft

Drill hole diameter: Size: 6 in Depth: 320 ft

Casing Record: Size: 6 in From depth to depth: 0-104 ft

Type of material: Steel Wall thickness: 0.280 in

Static Water Level: 40 ft Date: 5/11/66

Well Yield Drawdown Date
(gpm) (ft)
40 Unknown Unknown

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 7.5
Type: VHS R.P.M.: 1800
Model No.: SF1-15 Phase: 3

Pump: Manufacturer: Worthington Type: Vertical turbine
Number of stages: 15 R.P.M.: 1800
Capacity: 125 GPM @ Unknown TDH Suction Size: 4 in
Bowl:  Column:  Length:  60 ft  Diameter:  4 in

Auxiliary Engine:  Manufacturer:  Wisconsin
Type:  THD
Plant Name: Tuckaway Terrace (Plant not in service)

Well Number: 1

Location: East of Rose Ave.; Northside of Wister Lane; NW¼ Sec 29-T21S-R29E (Lat. 28°38'08"N, Long. 81°26'30"W+)

Ground elevation: 95 ft+

Drill hole diameter: Size: 6 in   Depth: 218 ft

Casing Record: Size: 6 in   From depth to depth: 0-83 ft

Static Water Level: 40 ft   Date: Unknown

Well ownership history: Southern Gulf Utilities  Orange County (acquired July, 1975)

Well usage: No longer in service

**WELL PUMP**

Motor: Manufacturer: U.S.   Horsepower: 5

Serial No.: 2538071   Type: VHS

R.P.M.: 3600

Pump: Manufacturer: Worthington   Model No.: ODAE

Size: 5-5/8 in   Type: Vertical turbine

Serial No.: A1512091   R.P.M.: 3600

Capacity: 2 wells: 185 GPM @ Unknown TDH
Plant Name: Tuckaway Terrace (Plant not in service)

Well Number: 2

Location: East of Rose Ave.; Northside Wister Lane
NW 4 Sec 29-T21S-R29E (Lat. 28° 38'08"N, Long. 81° 26'30"W+)

Ground elevation: 95 ft+

Drill hole diameter: Size: 8 in Depth: 505 ft

Casing Record: Size: 8 in
From depth to depth: 0-83 ft
6 in
75-192 ft

Static Water Level: 49 ft Date: Unknown

Well Yield Drawdown Specific Capacity
(gpm) (ft) (gpm/ft drawdown) Date
333 7.5 44.4 Unknown

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: No longer in service

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 7.5
Serial No.: 2473655 Type: VHS
R.P.M.: 3600

Pump: Manufacturer: Deming Model No.: 4701
Serial No.: MT6819 R.P.M.: 3600
Capacity: 2 wells: 185 GPM @ Unknown TDH
CHAPTER VIII
FAR NORTHWEST AREA WELLS

Orange County owns, operates, and maintains six water treatment plants in the far northwest area, all of which are active. This area is bounded roughly by Ondich Road on the north, Wekiwa Springs Road on the east, Semoran Boulevard on the south, and Hermit Smith Road on the west. At these six plants, there are seven wells in service and one well out-of-service. The treatment plants are listed in Table VIII-1 and their locations are shown in Figure VIII-1.

Table VIII-2 gives elevation and depth data for the wells themselves, the casing pipe in each well, and the static water level recorded in each well. Most of the wells fall into the upper level of the Floridan Aquifer. The deepest is 460 feet below the ground surface. The shallowest, Plant 26 (Mount Plymouth Lakes) at 127 feet below ground surface, is similar to the wells at Plant 50 and inactive Ridge Manor in the west area in that it is more shallow than generally considered necessary to penetrate the Floridan Aquifer. This well is probably also penetrating a shallow artesian aquifer. The mean value of well depth is 279 feet below ground surface.
TABLE VIII-1

ORANGE COUNTY WELLS LOCATED IN FAR NORTHWEST AREA

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Plant Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Mount Plymouth Lakes</td>
</tr>
<tr>
<td>31</td>
<td>Plymouth</td>
</tr>
<tr>
<td>32</td>
<td>Plymouth Heights</td>
</tr>
<tr>
<td>33</td>
<td>Plymouth Hills</td>
</tr>
<tr>
<td>39</td>
<td>Rock Springs</td>
</tr>
<tr>
<td>47</td>
<td>Wekiva Manor (formerly Stoney Brook or Wekiwa Ridge)</td>
</tr>
</tbody>
</table>
Fig. VIII-1. Location map for far northwest area wells.
### TABLE VIII-2

**FAR NORTHWEST AREA WELLS - ELEVATION/DEPTH DATA**

<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Grnd Elev. (ft)</th>
<th>Well Depth (ft)</th>
<th>Casing Depth (ft)</th>
<th>Static Water Level (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MSL From Surface Elev. MSL</td>
<td>From Surface Elev. MSL</td>
<td>From Surface Elev. MSL From Surface Elev. MSL</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>-</td>
<td>97</td>
<td>127</td>
<td>97</td>
<td>0</td>
</tr>
<tr>
<td>31</td>
<td>-</td>
<td>120</td>
<td>460</td>
<td>127</td>
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<td>95</td>
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</tr>
<tr>
<td>33</td>
<td>-</td>
<td>143</td>
<td>435</td>
<td>105</td>
<td>38</td>
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<td>39</td>
<td>1</td>
<td>82</td>
<td>190</td>
<td>50</td>
<td>32</td>
</tr>
<tr>
<td>39</td>
<td>2</td>
<td>82</td>
<td>165/250*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>39</td>
<td>3</td>
<td>82</td>
<td>165/225*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>47</td>
<td>-</td>
<td>104</td>
<td>391</td>
<td>92</td>
<td>12</td>
</tr>
</tbody>
</table>

|                |        |                |                | 50/57/56** | 54/47/48** |
| Mean           | 279    | -178           | 94             | 15         | 57         |
| Deepest       | 460    | -340           | 127            | - 7        | 90         |
| Shallowest     | 127    | - 30           | 50             | 38         | 40         |

* * Readings taken on different dates  
** ** Conflicting data from different references
Casing pipe depths vary from 50 to 127 feet below ground with the average being 94 feet. Static water level depths range from 40 to 90 feet below ground surface, with the mean being 57 feet. All static water level values shown are in reasonable agreement with levels recorded on U.S.G.S. piezometric surface level maps.

Table VIII-3 provides pumping data from the wells. Tested flows in the far northwest area ranged from a low of 75 gallons per minute to a high of 500 GPM, with the mean being 282. For the wells with data available, specific capacity varied from 50.0 to 83.3 GPM per foot of drawdown, averaging 69.1. Flow per unit well circumference had a mean value of 13.06 GPM per inch, with a range of 5.97 to 19.89. Specific capacity per unit well circumference for the wells having data available ranged from 1.98 to 3.32 GPM per foot of drawdown per inch circumference, with a mean value of 2.75.

Interestingly, the high values for each of the well flow categories are from Plant No. 26, the well with depth of 127 feet. This would show that the shallow artesian aquifer has the potential in certain locations to be very productive.

Table VIII-4 compares concentrations of physical and chemical compounds recorded through chemical analysis of each well. All wells are within the established limits for total dissolved solids and chloride. As with all other areas, all wells are within the hardness classifications of either moderately hard or hard.
<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Max. Pumping Test Flow (gpm)</th>
<th>Specific Capacity per Unit Circumference (gpm/ft drawdown -in circum.)</th>
<th>Specific Capacity per Unit Circumference (gpm/in circum.)</th>
<th>Flow per Unit Well Circumference (gpm/ft drawdown)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500</td>
<td>3.32</td>
<td>1.98</td>
<td>19.89</td>
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<td></td>
<td>500</td>
<td>83.3</td>
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<td>150</td>
<td>11.94</td>
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<td>10.61</td>
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<td>74</td>
<td>17.90</td>
<td>17.90</td>
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<td>2.75</td>
<td>13.06</td>
<td>13.06</td>
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<td>3.32</td>
<td>19.89</td>
<td>19.89</td>
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<td>1.98</td>
<td>5.97</td>
<td>5.97</td>
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<td>47</td>
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</tr>
</tbody>
</table>

TABLE VIII-3
FAR NORTHWEST AREA WELLS - PUMPING DATA

Mean 282
Highest 69.1
Lowest 3.32
<table>
<thead>
<tr>
<th>Plant No.</th>
<th>Well #</th>
<th>Total Dissolved Solids (mg/l)</th>
<th>Total Alkalinity CaCO₃ (mg/l)</th>
<th>Total Hardness CaCO₃ (mg/l)</th>
<th>Chloride Cl⁻ (mg/l)</th>
<th>Sulfide S⁻ (mg/l)</th>
<th>Iron Fe (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>-</td>
<td>224</td>
<td>120</td>
<td>123</td>
<td>3</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
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<tr>
<td>31</td>
<td>-</td>
<td>317</td>
<td>200</td>
<td>204</td>
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<td>1.3</td>
<td>0.1</td>
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<tr>
<td>32</td>
<td>-</td>
<td>245</td>
<td>165</td>
<td>162</td>
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<td>0.02</td>
<td>0.37</td>
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<td>160</td>
<td>108</td>
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<td>3</td>
<td>1.1</td>
<td>&lt; 0.1</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>39</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>--</td>
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<td>---</td>
</tr>
<tr>
<td>39</td>
<td>3</td>
<td>---</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>47</td>
<td>-</td>
<td>205</td>
<td>120</td>
<td>118</td>
<td>2</td>
<td>0.7</td>
<td>0.1</td>
</tr>
</tbody>
</table>

| Mean     |        | 230                           | 143                           | 143                         | 9                  | 0.64           | 0.15         |
| Highest  |        | 317                           | 200                           | 204                         | 24                 | 1.3            | 0.37         |
| Lowest   |        | 160                           | 108                           | 108                         | 2                  | 0.02           | < 0.1        |
The iron level is slightly above the established limit at Plant No. 32 (Plymouth Heights).

Available records of bacteriological tests indicate there has been a history of unsatisfactory results at Plant No. 26 (Mount Plymouth Lakes), Plant No. 33 (Plymouth Hills), and Well No. 2 at Plant No. 39 (Rock Springs). The unsatisfactory test results occur each year during the dry season only at Mount Plymouth Lakes. The only explanation offered by the Orange County Sewer and Water Department is that a nearby lake tends to recharge the aquifer at the well's location when the piezometric surface elevation recedes during the dry season. Well No. 2 at Rock Springs incurred unsatisfactory results from stagnated water caused by only occasional use and due to a partial casing collapse. The well has since been taken out of service. No explanation could be offered for the unsatisfactory results at Plymouth Hills (Stewart, 1981).

Individual data sheets for each of the wells in the far northwest area are shown in the following pages.
Plant Name: No. 26 - Mount Plymouth Lakes

Location: 6330 Fortune Lane, Apopka; NW ¼ Sec 9-T20S-R28E (Lat. 28°46'01" N, Long. 81°31'12" W)

Date Drilled: 1956

Drilled by: Tracey

Type of drilling: Cable-tool

Ground elevation: 97 ft

Drill hole diameter: Size: 8 in  Depth: 127 ft

Casing Record: Size: 8 in  From depth to depth: 0-97 ft

Type of material: Steel

Well Yield (gpm)  Drawdown (ft)  Specific Capacity (gpm/ft drawdown)  Date

400  6  66.7  Unknown
500  6  83.3  Unknown

Well ownership history: Mount Plymouth Lakes Utilities Orange County (acquired 5/3/76)

Well usage: Public supply

Bacteriological history: 22 unsatisfactory samples: 1/13/77-10/26/77

WELL PUMP

Motor: Manufacturer: G.E.  Horsepower: 25
Serial No.: OLJ215003  Model No.: 5K364XA121A
Phase: 3  Volts: 220/440

Pump: Manufacturer: Johnson  Type: Vertical turbine
Serial No.: JL1054  Capacity: 400 GPM @ Unknown TDH
Plant Name: No. 31 - Plymouth

Location: Orange Avenue, north of American Blvd., SW 1/4 Sec 6-T21S-R28E (Lat. 28°41'27"N, Long. 81°33'23" W+)

Date Drilled: 3/7/68-3/17/68

Drilled by: Locke Well and Pump Company

Type of drilling: cable-tool

Ground elevation: 120 ft +

Drill hole diameter: Size: 8 in Depth: 460 ft

Casing Record: Size: 8 in From depth to depth: 0-126'8"

Static Water Level: 60 ft Date: Unknown

Well Yield Drawdown Specific Capacity Date (gpm) (ft) (gpm/ft drawdown) Date

500 10 50 6/14/68

Well ownership history: Plymouth Citrus Growers
Meridith Corporation
Orange County

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +6 2/9/77
+24 2/15/77
+3 3/9/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 15

Serial No.: 1003407 Type: HU

R.P.M.: 3600 Phase: 3

Volts: 220/440

Pump: Manufacturer: Peerless Size: 6 x 6 x 12

Type: Vertical turbine Number of stages: 2
Serial No.: 2819
R.P.M.: 3600

Capacity: 450 GPM @ 100 ft TDH
Efficiency: 76%

Bowl: Model No.: 7HXB
Number of Bowls: 2
Size: 6-3/4 in

Column: Length: 100 ft
Diameter: 5 in

Auxiliary Engine: Manufacturer: Leroi
Model No.: 0201
Serial No.: 25K0852

Type: Gasoline
Horsepower: 30
Plant Name: No. 32 - Plymouth Heights

Location: Mayflower Ave. and Boy scout Blvd, SE¼ Sec 6-T21S-R28E (Lat. 28°41'11"N, Long. 81°32'44"W+)

Date Drilled: 1953

Ground elevation: 95 ft+

Drill hole diameter: Size: 4 in Depth: 223 ft

Static Water Level: 40 ft Date: Unknown

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +6 7/6/77
+7 7/11/77
+10 7/13/77
+6 7/14/77

WELL PUMP

Motor: Manufacturer: G.E. Horsepower: 5
Phase: 3

Pump: Manufacturer: Jacuzzi Model No.: 11D35P
Size: 4 x 2 Type: Vertical turbine
Capacity: 150 GPM @ 140 ft TDH

Column Length: 73 ft
Plant Name: No. 33 - Plymouth Hills

Location: 1326 Hermit Smith Rd.; Apopka, SE4 Sec 36-T20S-R27E (Lat. 28°42'12"N, Long. 81°34'02"W+)

Date Drilled: 5/17/71-5/27/71

Drilled by: Central Florida Well Drillers

Ground elevation: 143 ft+

Drill hole diameter: Size: 6 in    Depth: 435 ft

Casing Record: Size: 6 in    From depth to depth: 0-105 ft

Type of material: Steel

Static Water Level: 90 ft    Date: Unknown

Well ownership history: Central Florida Utilities
Orange County

Well usage: Public supply

Bacteriological history: Unsatisfactory samples: +31 1/13/77
+ 7 3/9/77
+ 4 7/6/77
+ 5 8/9/77

WELL PUMP

Motor: Manufacturer: A.O. Smith    Horsepower: 10
R.P.M.: 3600    Model No.: 254-2658 B

Phase: 3

Pump: Manufacturer: Sta-Rite    Type: Vertical turbine
R.P.M.: 3450    Capacity: 200 GPM @ Unknown TDH
Plant Name: No. 39 - Rock Springs

Well Number: 1

Location: William Ave. at Virginia St.; NE Sec 16-T20S-R28E
(Lat. 28°45'18" N, Long. 81°30'42" W)

Date Drilled: 10/4/71-10/7/71

Drilled by: Meridith Corporation

Ground elevation: 82 ft +

Drill hole diameter: Size: 8 in Depth: 190 ft

Casing Record: Size: 8 in From depth to depth: 0-50 ft

Type of material: Steel

Static Water Level: 42 ft Date: 10/7/71

Well ownership history: Southern States Utilities
Orange County (acquired Sept., 1976)

Well usage: Public supply

Bacteriological history: 5 unsatisfactory samples: 5/17/77-10/11/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 20
Serial No.: R2040417 Type: VHS-RU
R.P.M.: 1800 Model No.: R8537-01-271C
Phase: 3 Volts: 230/460 Amps: 48.8/24.4

Pump: Manufacturer: Worthington Model No.: 8M-28
Size: VTP 33462 Type: Vertical turbine
Number of stages: 7 R.P.M.: 1760
Capacity: 300 GPM @ 191 ft TDH
Impeller Diameter: 5-9/16 in
Bowl: Number of bowls: 7
Column: Length: 70 ft
Suction Size: 5 in
Efficiency: 79%
Size: 7\(\frac{1}{2}\) in
Diameter: 5 in
Plant Name: No. 39 – Rock Springs

Well Number: 2

Location: William Ave. at Virginia St.; NE1/4 Sec 16-T20S-R28E
(Lat. 28°45'18" N, Long. 81°30'42" W)

Date Drilled: 1957 or 1960*

Drilled by: Meridith Brothers

Ground elevation: 82 ft +

Drill hole diameter: Size: 4 in Depth: 165 or 250 ft*

Casing Record: Size: 4 in From depth to depth: 0-unknown ft

Type of material: Black Iron Wall thickness: 0.237 in

Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)

Well usage: No longer in service

Bacteriological history: 8 unsatisfactory samples: 5/17/77-10/6/77

WELL PUMP

Motor: Manufacturer: U.S. Horsepower: 5

Type: Hollowshaft R.P.M.: 3600

Model No.: CSN-226 PY-JVS-1BK Phase: 3

Pump: Manufacturer: Jacuzzi Model No.: 5VHJ

Type: Jet R.P.M.: 3450

Capacity: 75 GPM @ Unknown TDH

* Conflicting data
Plant Name: No. 39 - Rock Springs
Well Number: 3
Location: William Ave. at Virginia St; NE¼ Sec 16-T20S-R28E (Lat. 28°45'18" N, Long. 81°30'42" W)
Date Drilled: 1957 or 1960*
Drilled by: Meridith Brothers
Ground elevation: 82 ft +
Drill hole diameter: Size: 4 in Depth: 165 or 225 ft*
Casing Record: Size: 4 in From depth to depth: 0-unknown ft
Type of material: Black iron Wall thickness: 0.237 in
Well ownership history: Southern States Utilities Orange County (acquired Sept., 1976)
Well usage: Public supply

**WELL PUMP**

Motor: Manufacturer: U.S. Horsepower: 5
Type: Hollowshaft R.P.M.: 3600
Phase: 3

Pump: Manufacturer: Jacuzzi Model No.: 5VHJ
Type: Jet R.P.M.: 3450
Capacity: 80 GPM @ Unknown TDH

* Conflicting data
Plant Name: No. 47 - Wekiva Manor (formerly Stoney Brook or Wekiwa Ridge)

Location: 205 Apollo Dr.; Apopka; SW Sec 12-T21S-R28E
(Lat. 28°40'29" N, Long. 81°28'28" W)

Ground elevation: 104 ft

Drill hole diameter: Size: 8 in  Depth: 391 ft

Casing Record: Size: 8 in  From depth to depth: 0-92 ft

Static Water Level and Dates:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 ft</td>
<td>Unknown</td>
</tr>
<tr>
<td>57.42 ft</td>
<td>5/5/76</td>
</tr>
<tr>
<td>56'7&quot;</td>
<td>2/9/77</td>
</tr>
</tbody>
</table>

Well Yield (gpm)  Drawdown (ft)  Specific Capacity (gpm/ft drawdown)  Date

| 450 | 6'1" | 74 | 2/9/77 |

Well ownership history: Southern Gulf Utilities
Orange County (acquired July, 1975)

Well usage: Public supply

Bacteriological history: 6 unsatisfactory samples: 2/9/77-10/6/77

WELL PUMP

Motor: Manufacturer: U.S.  Horsepower: 25

Serial No.: R2931-02-625  R.P.M.: 1800

Phase: 3  Volts: 460

Amps: 31

Pump: Manufacturer: Berkley  Model No.: 804H

Type: Vertical turbine  Number of stages: 8

Serial No.: 7525962  R.P.M.: 1760

Capacity: 450 gpm @ Unknown TDH
Bowl: Model No.: 804H  
Number of bowls: 8

Setting: 80 ft

Auxiliary Engine: None
CHAPTER IX
SUMMARY AND CONCLUSIONS

Data Comparison by Geographical Area

Data compiled and shown in previous chapters by geographical area has been used to prepare a series of graphs comparing mean, high and low values of the various parameters according to their geographical area. These graphs indicate any significant variation that may exist in the public water supply throughout the different areas in Orange County.

Figure IX-1 compares mean, deepest, and shallowest values of total well depth, both by depth from surface and by mean sea level elevation. The graphs are constructed eliminating the wells penetrating the lower level of the Floridan Aquifer in the southeast area of the County for comparison of the upper levels of the Floridan Aquifer and any shallow artesian aquifers only. The graph shows that, in general, the wells become slightly shallower as you progress from east to west across the County, both from surface level and by actual elevation. This would indicate that water is available closer to the surface and at an elevation closer to sea level in the western part of the County than in the eastern part, but not necessarily in larger volumes.
Fig. IX-1. Comparison of Orange County well depths by geographical area.

--- Depth from surface --- Elevation MSL
Figure IX-2 gives similar information for well casing depths. Correlation is not as well defined here. Although the mean values of both depth from surface and mean sea level elevation are slightly shallower as you progress from east to west, the deepest and shallowest values fluctuate in no apparent pattern. The deepest casing pipe is found in the westerly area. This might indicate that the non-artesian shallow ground water aquifer, in general, has a bottom slightly closer to the surface and at a higher elevation in the west than in the east, but that the formation is somewhat fractured allowing this aquifer to extend much deeper in particular locations.

Figure IX-3 compares static water level, representing the piezometric surface of the Aquifer at a particular location, for the various areas of the County. Only deepest and shallowest values are plotted, as mean values have little significance due to the dependence on time of measurement for specific locations. Fluctuations of up to 25 feet at a particular well were noted over a period of time as shown on U.S.G.S. piezometric surface level maps. This is an important point to keep in mind when selecting the length of column pipe while designing a well. In general, the graph shows an increasing depth from surface to the static water level as you progress from east to west. As measured from sea level, the highest elevations occur in the southwest area which is in agreement with the literature. The
Fig. IX-2. Comparison of Orange County well casing depth by geographical area.

Depth from surface  Elevation MSL
Fig. IX-3. Comparison of Orange County well static water levels by geographical area.

1. Depth below surface
2. Elevation MSL
lowest elevations appear to occur in the east, west and far northwest areas with no real differentiation. This differs somewhat from the literature which states that the piezometric surface slopes down to the east and northeast. It is probable that the random values available for the graph shown are not completely representative of the actual condition of the Floridan Aquifer.

Table IX-1 provides official rainfall data between the years 1945 and 1980 for the Orlando area (U.S. Department of Commerce, 1978, 1979 and 1980). Correlations between static water levels and rainfall were attempted without much success. One reason for this is that the recorded rainfall may or may not be representative of the rainfall actually occurring near a particular well site. The locations for official rainfall sampling are listed in Table IX-1 and are shown in Figure III-1. These locations are a significant distance from many of the wells and the corresponding rainfall may also be significantly different.

Figure IX-4 compares specific capacity for the five areas. Comparison of the values for specific capacity, as discussed in Chapter IV, is the only significant comparison for the data collected and is, therefore, the only one plotted. The other relationships involving well circumference can be misleading as it is unknown if each well has been pumped to its limit. Even the comparison for specific capacity does not present a realistic situation due to the limited data which was available. The data
**TABLE IX-1**

**ORLANDO, FLORIDA ANNUAL RAINFALL**

<table>
<thead>
<tr>
<th>Year</th>
<th>Rainfall Recorded (inches)</th>
<th>Sampling Location</th>
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<tr>
<td>1945</td>
<td>55.95</td>
<td>Herndon Airport</td>
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<tr>
<td>1946</td>
<td>50.13</td>
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</tr>
<tr>
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<td>Herndon Airport</td>
</tr>
<tr>
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<tr>
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</table>
Fig. IX-4. Comparison of Orange County well pumping specific capacities by geographical area.
available indicates by far the highest values for specific capacity are in the westerly area, with the lowest and most consistent levels being in the southeast and far northwest areas.

Figures IX-5 through IX-7 compare water quality parameters for the areas. Figure IX-5 shows total dissolved solids and chloride concentrations. There is not much variation noted through the five areas of the County system. There is, however, some variance with values shown in the literature and discussed in Chapter II. None of the wells owned by Orange County are in the far easterly area near the St. Johns River where high mineral contents of wells have been noted in the literature. The wells in Orange County's system extend from approximately the middle of eastern Orange County to the far western border. The literature indicates the level of mineral content, particularly in the western part of the County, is low; with values of total dissolved solids below 150 mg/l (Lichtler, et al., 1964). Data obtained from this study showed only one well in the entire system with a concentration as low as 150 mg/l. The mean value was lowest in the west, with a value of 198 mg/l. All areas, including the west, had levels in some wells exceeding 300 mg/l.

Figure IX-6 shows comparisons for total alkalinity and total hardness. The highest values appear to be in the east area, with not a great deal of fluctuation throughout the County.
Fig. IX-5. Comparison of concentrations of total dissolved solids and chloride in Orange County wells by geographical area.

- Total dissolved solids
- Chloride
Fig. IX-6. Comparison of concentrations of total alkalinity and total hardness in Orange County wells by geographical area.

- Total alkalinity
- Total hardness

- Highest Values
- Mean Values
- Lowest Values
Fig. IX-7. Comparison of concentrations of Iron and Sulfide in Orange County wells by geographical area.

- Iron  
- Sulfide
Figure IX-7 compares concentrations of iron and sulfide. This graph shows both substances are highest in the east and reduce as you progress to the west.

**Recommendations for Additional Studies**

This report has been a research study to collect and compare data on public water supply wells owned by the Orange County government. No attempt has been made to run tests or obtain original data from field observation of the Orange County system or to obtain information on nearby wells owned by entities other than Orange County.

Further studies are recommended which would add to and clarify the data already accumulated, thereby giving more significance to the comparisons attempted in this chapter.

The studies recommended are two-fold. The first would best be undertaken by Orange County, or a consultant obtained by them. This would involve field verification of data previously accumulated and the addition of data not available in existing files or literature on the Orange County system. Recommended testing would include the chemical analyses of water samples, electronic well logs, and pump and well flow tests, including static water level and drawdown determination over a short period of time for significant comparison. The second recommended study is a similar research report to this one for other wells in the Orange County region, such as those owned by adjacent cities and private
or investor owned utility companies. This second study could be expanded to include the same field determination and testing as that recommended for the Orange County system.
REFERENCES


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