

**CHAPTER 62, ARTICLE X,
DIVISION 7.**

WATER-SOURCE HEAT PUMPS*

* **Editors Note:** At the request of the county, Ord. No. 85-33, adopted Oct. 8, 1985, has been included in this Code. As the ordinance was not specifically amendatory, such provisions have been designated as ch. 62, art. X, div. 7, §§ 62-3771--62-3774, at the discretion of the editor.

Cross References: Environment, ch. 46; aquifer protection, § 62-3631 et seq.

State Law References: Environmental protection provisions required, F.S. § 163.3202(2)(c)--(2)(e); conservation programs authorized, F.S. § 125.01(1)(k); environmental control, F.S. ch. 403.

Sec. 62-3771. Purpose and authority.

Purpose. The establishment of a water-source heat pump program is a vital step in insuring the future presence of an adequate water supply for the inhabitants of the county. The general welfare, health, safety and convenience of the community are directly affected by the use and availability of water. It is, therefore, in the interest of the public that a water-source heat pump program be designed and developed in accordance with sound rules and proper minimum standards. The purpose and intent of this division is as follows:

- (1) To establish installation standards for water-source heat pumps that will encourage water conservation practices.
- (2) To provide regulations and controls with necessary enforcement mechanisms.

(Ord. No. 85-33, § 1, 10-8-85)

Sec. 62-3772. Definitions.

For the purpose of this division, the following terms shall the meaning set forth in this section. When not inconsistent with the context, words used in the present tense include the future, words in the plural number include the singular, and words in the singular include the plural. The word "shall" is always mandatory and not merely directive.

A.C.C.A. refers to the Air Conditioner Contractors of America.

Artesian well refers to a well that penetrates a confined aquifer in which the water level in that well rises above the top of the aquifer.

Board refers to the board of county commissioners of Brevard County.

Closed-loop. See "earth-coupled closed-loop."

County refers to Brevard County.

Demand valve. A control switch that adjusts, activates or terminates the quantity of flow from a water system.

Development. A material change in the use or character of the land including, but not limited to, the placement of any structure or site improvement on the land.

Division shall mean the environmental services division of Brevard County.

Domestic consumption shall mean water used in direct human contact for drinking, cooking, bathing and cleaning purposes inside a residential or commercial establishment.

Drop-pipe refers to a suction or discharge line installed in a well to a level either below the identified or static water level.

Earth-coupled closed-loop. A closed-tube heat exchanger installed in the ground either vertically or horizontally and filled with a noncorrosive potable fluid circulating under pressure between the loop and heat pump.

Earth-coupled closed-loop borehole. A drilled vertical hole in the earth expressly for the purpose of installing a closed tube heat exchanger.

Grout refers to a mixture of water and Portland cement (American Concrete Institute Type I, ACI Type III or any other types of cement approved by the State of Florida for grouting of well casings), or a mixture of bentonite and water, which is suitable for pumping and has a minimum adhesiveness and is free from organic or foreign matter.

Grouting refers to filling the space around a well casing or closed-loop with a suitable slurry of cement or clay. Grouting and sealing shall be done in accordance with procedures described in the rules of the St. Johns River Water Management District, Chapter 40C-3.517, Florida Administrative Code.

Person shall mean any individual, firm, corporation or other legal entity, whether public or private.

Irrigation shall mean the method by which water is artificially applied to land surfaces, for the purpose of supplementing natural rainfall.

Lot. A parcel of land shown on a recorded plat or on the Brevard County

Property Appraiser's map, or any piece of land described by deed in the official record books of Brevard County.

Open discharge system. A single-well installation producing but not returning water to the aquifer of origin.

Open-loop. A two-well installation including both supply and injection wells open to the same aquifer which is capable of producing and accepting water for thermal transfer.

Open recharge system. A single-well installation producing water from an aquifer and partially returning water through infiltration to the aquifer of origin.

Public water supply system shall mean a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

Replacement means the replacement of the coils, condenser or parts of the unit sufficient to cost at least 50 percent of the cost of the original unit.

Water refers to potable fluid taken from any source in Brevard County, whether stored in ground or surface units, or from any public or private supply.

Water-source heat pumps includes single or reverse cycle mechanical devices for heating or cooling which requires the use of flowing water as a condensing medium for heat transfer.

Well means any excavation that is drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed when the intended use of such excavation is for the location, acquisition, development or artificial recharge of ground water. (Ord. No. 85-33, § 2, 10-8-85; Ord. No. 86-16, § 1, 8-5-86)

Sec. 62-3773. Area of operation; exemptions; implementation.

(a) Provisions of this division shall apply to all areas of the county.

(b) This division shall not apply to incorporated municipalities where a water-source heat pump ordinance or ordinances is in effect that is at least as restrictive as herein.

(c) The curtailments, restrictions and compliance schedules of water uses provided herein shall be implemented as of the effective date of this division.

(Ord. No. 85-33, § 3, 10-8-85)

Sec. 62-3774. General conditions.

- (a) No individual within the county shall:
 - (1) Attach a new or modified water-source heat pump to an existing artesian well;
 - (2) Replace an existing water-source heat pump unit now utilizing an artesian well;
 - (3) Drill an artesian well for use by water-source heat pump unit;
 - (4) Drill a new artesian well for an existing water-source heat pump unit;

Unless said heat pump unit is equipped with a second well of equal or greater depth so that water withdrawn can be returned to the aquifer of origin. This division does not prohibit the use of water from either well for irrigation purposes.

(b) Prior to December 1, 1986, all existing water-source heat pump units using an artesian well which do not have a return well of equal or greater depth shall be required to have in operation a demand valve which prevents the flow of water from the well when the heat pump unit is not in operation.

(c) All water-source heat pump units which withdraw water from an artesian well shall install or utilize a second well of equal size and equal or greater depth for the purpose of returning the water to the aquifer of origin, when the heat pump unit is being replaced.

(d) Water-source heat pump units withdrawing water from the surficial aquifer system may be installed as a single well system if it is an open recharge system, where the discharge is used for irrigation and percolation capacity is available to absorb peak daily discharge within the boundaries of the individual's lot. Where percolation capacity is not available, an open-loop or closed-loop system will be required.

- (e) Injection well standards.
 - (1) All open-loop injection systems, including a supply and return well pair, shall be required to have a minimum spacing of 50 feet for new low density single-family residential structures, or those systems under 15 gallons per minute, or those systems under five tons' designed air conditioning load. All other open-loop systems shall follow the minimum horizontal spacing requirements as presented in Table I, made part hereof, for the identified source

aquifer. This spacing requirement shall include any wells on the applicant's or adjacent property owner's land. Spacing requirements of 100-F, Florida Administrative Code, or applicable county health codes supersede this standard if more stringent.

TABLE I
MINIMUM HORIZONTAL SPACING
BETWEEN INJECTION WELL AND SUPPLY WELL
FOR FLORIDAN AQUIFER (ARTESIAN) INSTALLATIONS

| | | | | | |
|--|-----|-----|-----|-----|-----|
| | 20 | 25 | 30 | 35 | 40 |
| | 122 | 134 | 145 | 155 | 164 |
| | 118 | 126 | 134 | 141 | 148 |
| | 102 | 110 | 116 | 122 | 128 |
| | 92 | 98 | 104 | 110 | 115 |
| | 84 | 89 | 95 | 100 | 105 |
| | 77 | 83 | 88 | 92 | 97 |
| | 71 | 77 | 82 | 87 | 91 |

*Assumption of 8 month use for cooling node.

- (2) Injection well capacity shall equal or exceed 150 percent [of] the design capacity requirements of the water-source heat pump system.
- (3) The injection system of an artesian well shall be designed to provide adequate injection pressures to overcome recorded maximum natural artesian head where present.
- (4) If natural artesian pressure does not exist, a drop-pipe is required. Pressurization of the injection line and drop-pipe shall be done by using a spring-loaded check valve installed in reverse. To obtain the proper setting, adjust the spring as follows:

Water level (static) $\times 0.43 \div 10$ psi or use the following table:

| Depth to Static Water Level (Feet) | Spring Release Pressure (psi) |
|------------------------------------|-------------------------------|
| 0 | 10 |
| 10 | 14 |
| 20 | 18 |

| | |
|-----|----|
| 30 | 23 |
| 40 | 27 |
| 50 | 31 |
| 60 | 36 |
| 70 | 40 |
| 80 | 45 |
| 90 | 49 |
| 100 | 53 |

The drop-pipe shall extend below the lowest yearly water level of the well, where the water level is at or below land surface.

- (5) Thermal re-injection limits shall be 15 degrees C. (59 degrees F.) for the heating mode and 35 degrees C. (95 degrees F.) for the cooling mode.
- (6) Maintenance programs such as backflushing and well stimulation of the injection well should be scheduled periodically to reduce pressure build-up and to optimize the thermal exchange characteristics of the well. Well stimulation techniques refer to, but are not limited to, those in § 17-28.12(56) Florida Administrative Code. A licensed water well contractor is required unless prior approval is given by the division.
- (7) All injection wells shall be drilled by licensed water well contractors and permitted where required by the St. Johns River Water Management District, Chapter 40C-3, Florida Administrative Code, or the Florida Department of Environmental Regulation as a Class V injection well, pursuant to Chapter 17-28, Florida Administrative Code, prior to construction.
- (8) Injection wells will be completed to the aquifer and zone of origin unless otherwise directed by the division; open bore holes shall be a minimum of 50 feet.
- (9) System water flows shall not exceed three gallons per minute per ton of air conditioning load installed. A fixed orifice flow device on the discharge side shall be installed to limit the flow as required.
- (10) All open-loop or single-well systems, where authorized, shall have a demand valve to stop the flow of water when the water-source heat pump is not operating. Multipurpose well systems may have a multiple-pump design if a pump shut-off device is necessary to allow withdrawals during heat pump shut-down.
- (11) Well casings shall be completed at or above grade to allow vertical access for maintenance of section procedures in accordance with

Chapter 17-21, Florida Administrative Code.

- (12) All wells shall be disinfected prior to operation to prevent cross-contamination between zones or plumes of the aquifer strata producing supply water either identified or unknown.
- (f) Earth-coupled closed-loop borehole standards.
 - (1) Vertical boreholes shall be spaced a minimum of 15 feet apart. Horizontal trenches shall be spaced a minimum of six feet apart and tubing will be separated by two feet at four and six feet below grade.
 - (2) Boreholes shall be sealed with grout in accordance with Chapter 40C-3.5.17, Florida Administrative Code.
 - (3) No additives to the circulating fluid will be approved for placement in either vertical or horizontal earth-coupled closed-loop installations.
 - (4) All loops shall be pressure-tested prior to final job completion.
 - (5) All vertical boreholes shall be installed by licensed water well contractors.
- (g) No individual shall use a public water supply system to operate a new or modified water-source heat pump unit.
(Ord. No. 85-33, § 4, 10-8-85; Ord. No. 86-16, § 2, 8-5-86)