

REGION C WATER PLANNING GROUP

MODEL WATER CONSERVATION PLAN FOR MANUFACTURING WATER USES

FEBRUARY 2005

Prepared for:

**REGION C WATER
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This model water conservation plan was prepared by Freese and Nichols, Alan Plummer Associates, and Chiang, Patel, and Yerby for the Region C Water Planning Group. It is intended as a template for manufacturers within Region C as they develop their own water conservation plans. Manufacturers should customize the details to match their unique situation. The model plan was prepared pursuant to Texas Commission on Environmental Quality rules. The rules do not require a drought contingency plan for manufacturers.

The other Region C model water conservation plans (for municipal, steam electric power, and irrigation users) include example text for a fictional water user that can be edited to match a real-life situation. However, there are a large number of manufacturers in Region C with widely varying processes and water uses, and it is difficult to generate example text that is applicable to most manufacturers. This template provides a plan structure and instructions for the type of content that belongs in each section. The water conservation plans for the City of Fort Worth¹, the City of Dallas², New Mexico Office of the State Engineer (Guide for Commercial, Institutional, and Industrial Users)³ were used extensively in development of the model water conservation plan for manufacturing users.

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¹ Superscript numbers refer to references in Appendix A.

**POCA AGUA
MANUFACTURING
COMPANY**

**WATER CONSERVATION
PLAN**

FEBRUARY 2005

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Poca Agua Manufacturing Company

Water Conservation Plan February 2005

1. INTRODUCTION AND OBJECTIVES

Water supply has always been a key issue in the development of Texas. In recent years, the increasing population and economic development in Region C have led to growing demands for water supplies. At the same time, local and less expensive sources of water supply are largely developed. Additional supplies to meet higher demands will be expensive and difficult to develop. It is therefore important that we make efficient use of our existing supplies and make them last as long as possible. This will delay the need for new supplies, minimize the environmental impacts associated with developing new supplies, and delay the high cost of additional water supply development.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation plans for industrial or mining uses (Appendix B). The Poca Agua Manufacturing Company has adopted this water conservation plan pursuant to TCEQ guidelines and requirements.

The objectives of this plan are:

- To reduce water consumption from the level that would prevail without conservation efforts.
- To reduce the loss and waste of water.
- To improve efficiency in the use of water.
- To document the level of recycling and reuse within the manufacturing processes and for non-potable uses.

The plan lists the TCEQ rules; describes the manufacturing process at the Poca Agua Manufacturing Company and associated water uses; sets a water conservation goal; describes water measurement devices and methods; discusses leak detection, repair, and water loss accounting; and reports existing and future water use efficiency practices.

[This model water conservation plan was developed for the Region C Water Planning Group to assist manufacturers in preparing a site-specific water conservation plan. It contains a plan structure that meets all Texas Commission on Environmental Quality rules for industrial or mining use water conservation plans, along with recommendations on content to include in each section.]

2. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES

The TCEQ rules governing development of water conservation plans for industrial or mining use are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.3 of the Texas Administrative Code (TAC). Applicable TAC rules are presented in Appendix B. A water conservation plan is defined as “A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s)⁴.”

Conservation Plan Requirements

The minimum requirements in the TAC Title 30, Part 1, Chapter 288 for water conservation plans for industrial or mining uses are shown below.

TAC Reference	Subject	Plan Location
30 TAC §288.3(a)(1)	Water Use in the Production Process	Section 3
30 TAC §288.3(a)(2)	Water Conservation Goals Before May 1, 2005	Section 4
30 TAC §288.3(a)(3)	Water Conservation Goals After May 1, 2005	Section 4
30 TAC §288.3(a)(4)	Accurate Metering	Section 5
30 TAC §288.3(a)(5)	Leak Detection, Repair, and Water Loss Accounting	Section 6
30 TAC §288.3(a)(6)	Water Use Efficiency Process and/or Equipment Upgrades	Section 7
30 TAC §288.3(a)(7)	Other Conservation Practices	Section 8
30 TAC §288.3(b)	Review and Update of Plan	Section 9

[TCEQ rules do not require a drought contingency plan for industrial or mining water users.]

3. DESCRIPTION OF WATER USE IN THE PRODUCTION PROCESS

[Insert a description of water use in the production process. Show a schematic of the production process with all water use locations and flowrates in Appendix C.

This section must include a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal.

In typical manufacturing processes, water is used for cooling tower makeup water, steam generation, rinsing, washing, plating and metal finishing baths, conveyance of materials, wet scrubbers, and as an ingredient in products. Typical water sources include potable water purchased from a municipal water supplier, groundwater from wells, raw water diverted from lake or river, captured stormwater runoff, reclaimed wastewater purchased from a wastewater treatment plant, and reclaimed process water.]

4. SPECIFICATION OF WATER CONSERVATION GOALS

The Poca Agua Manufacturing Company has set a five-year goal of reducing water use to ____ ac-ft/yr by ____ [*five years from date of plan*] and a ten-year goal of reducing water use to ____ ac-ft/yr by ____ [*ten years from date of plan*]. These goals will be achieved using the following water conservation methods:

[Edit the water conservation goals and describe how they will be achieved.

This section must include specification of 5-year and 10-year water conservation goals and the basis for development of such goals.

To determine feasible water conservation goals, to provide the basis for these goals, and to identify a schedule for conservation savings, a four-step water conservation implementation process should be completed:

- 1. The first step consists of a water audit for the manufacturing facility. A water audit consists of an inventory of all water supplied to the site and all on-site water uses, including the amount of water used for each purpose. A comparison of the water supplied to the water used will reveal the amount of unaccounted-for water. Unaccounted-for water should be no more than 5 percent of total water supplied.*
- 2. The second step is to identify sources of water waste and to design procedures to reduce water waste and minimize unaccounted-for water. Water waste reduction measures may include reducing flow to process equipment, installing pressure-reducing valves, installing control or limit switches, or other measures.*
- 3. The third step is to identify methods to conserve water use in the manufacturing process, landscape irrigation, and other water uses. Emphasize water conservation methods that address the largest water uses identified in the audit step. Conservation methods could involve upgrading to water-efficient process equipment, water-wise landscaping, retrofit of domestic plumbing fixtures with water-efficient fixtures, employee education, and other methods.*
- 4. The fourth step is to identify opportunities to reuse process water. At the end of the process, is the water quality suitable for other uses? Is it economical to provide water treatment to improve the water quality to make it suitable for other uses?*

For each water conservation method, please provide a description of how the method will save water, a schedule for when the method will be implemented, and the projected water savings for each method.]

5. ACCURATE METERING TO MEASURE AND ACCOUNT FOR WATER

One of the key elements in water conservation is careful tracking of water use and control of losses. In order to carefully track and control losses, the Poca Agua Manufacturing Company meters water usage at several locations in the productions process.

[Insert a description of meter locations; meter types; meter calibration frequency; meter calibration tolerance; and meter data collection, tabulation, and storage. Refer to the water use diagram in Appendix C as necessary.]

This section must include a description of the device(s) and/or method(s) within an accuracy of plus or minus five percent to be used to measure and account for the amount of water diverted from the source of supply.

To assist in tracking of water usage, consider installing additional meters at key locations in the manufacturing process, particularly if unaccounted-for water is greater than 5 percent.]

6. LEAK DETECTION, REPAIR, AND WATER LOSS ACCOUNTING

At the Poca Agua Manufacturing Company, plant personnel observe, operate, and maintain facilities throughout the day. Inspection of aboveground piping and pump packing is a normal part of employee duties. In addition, flow meter readings are logged on a daily basis.

If a water leak is indicated by any of the above means, the source of the leak is investigated and a work order for repairs is issued as necessary.

[This section must include a description of leak-detection, repair, and water loss accounting in the water distribution system. Please amend the above description to match operations at your facility.]

Consider implementing an active leak detection and repair program if unaccounted-for water is greater than 5 percent.]

7. WATER USE EFFICIENCY PROCESS AND/OR EQUIPMENT UPGRADES

[This section must include a description of equipment and/or process modifications to improve water use efficiency.

It is suggested that you also include a description of existing water-efficient equipment or processes to demonstrate any water conservation savings that is already being achieved.

Equipment upgrades or process modifications should be a result of the third step in the four-step process recommended in Section 4.]

8. OTHER CONSERVATION PRACTICES, METHODS, OR TECHNIQUES

[This section must include any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal(s) of the water conservation plan.]

Other sections emphasize process water usage, equipment upgrades, and process modifications. This section should report on proposed conservation practices, methods, or techniques that address other water uses, such as domestic water use, housekeeping water use, and landscape irrigation. Potential conservation methods include retrofit of water-efficient toilets, showerheads, and faucet aerators; water-wise landscaping; employee education; and other methods. Each of these is described below.

The water audit in Section 4 should include a survey of landscape irrigation water use. This includes measurement of the landscape area, measurement of the total irrigable area, irrigation system checks and distribution uniformity analysis, and review or development of irrigation system scheduling. The water use survey should identify currently irrigated areas where irrigation can be discontinued due to low visibility or the plant materials that do not need supplemental irrigation. The survey should also identify areas with the opportunity for process water reuse, stormwater reuse, and reuse of treated effluent for landscape irrigation.

State and federal water efficiency standards require water-efficient plumbing fixtures for new construction and remodeling projects. Replacing older plumbing fixtures with water-efficient plumbing fixtures will conserve water. Other methods include retrofitting toilet tank displacement devices (toilet dam), early closure toilet flappers, and installation of a dual-flush adapter.

An employee education program is important to reducing water waste and conserving water. The manufacturer should inform and educate employees about the adopted water conservation program through inserts in the monthly paychecks, with letters detailing program successes and goals, and through posters and pamphlets posted throughout the facility. Additional educational opportunities exist through employee water conservation seminars and workshops, email, company newsletter, and memos³.

9. IMPLEMENTATION AND UPDATE OF THE WATER CONSERVATION PLAN

Appendix D contains a copy of the Board of Directors of the Poca Agua Manufacturing Company resolution adopting this water conservation plan. The resolution designates responsible officials to implement and enforce the water conservation plan.

Appendix E contains a copy of a letter to the chairman of the Region C Water Planning Group to inform the planning group of this water conservation plan.

This water conservation plan will be reviewed and updated every five years.

Appendix A
List of References

List of References

1. City of Fort Worth: “Emergency Water Management Plan for the City of Fort Worth,” Fort Worth, August 19, 2003.
2. City of Dallas Water Utilities Department: “City of Dallas Water Conservation Plan,” adopted by the City Council, Dallas, September 1999.
3. New Mexico Office of the State Engineer : “A Water Conservation Guide for Commercial, Institutional and Industrial Water Users,” July 1999, accessed online at <http://www.seo.state.nm.us/water-info/conservation/pdf-manuals/cii-users-guide.pdf>
4. Texas Commission on Environmental Quality: “Water Conservation Plans for Industrial or Mining Use,” *Texas Administrative Code* Title 30 Part I Subchapter A §288.3, effective October 7, 2004.

Appendix B

Texas Commission on Environmental Quality Rules on Water Conservation Plans for Industrial or Mining Water Use

TITLE 30

ENVIRONMENTAL QUALITY

PART 1

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CHAPTER 288

WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS

SUBCHAPTER A

WATER CONSERVATION PLANS

RULE §288.1

Definitions

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Agricultural or Agriculture--Any of the following activities:

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;

(B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) raising or keeping equine animals;

(E) wildlife management; and

(F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

(2) Agricultural use--Any use or activity involving agriculture, including irrigation.

(3) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

(4) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate

document identified as such or may be contained within another water management document(s).

(5) Industrial use--The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, commercial fish production, and the development of power by means other than hydroelectric, but does not include agricultural use.

(6) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water through a municipal distribution system.

(7) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.

(8) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field repressuring.

(9) Municipal per capita water use--The sum total of water diverted into a water supply system for residential, commercial, and public and institutional uses divided by actual population served.

(10) Municipal use--The use of potable water within or outside a municipality and its environs whether supplied by a person, privately owned utility, political subdivision, or other entity as well as the use of sewage effluent for certain purposes, including the use of treated water for domestic purposes, fighting fires, sprinkling streets, flushing sewers and drains, watering parks and parkways, and recreational purposes, including public and private swimming pools, the use of potable water in industrial and commercial enterprises supplied by a municipal distribution system without special construction to meet its demands, and for the watering of lawns and family gardens.

(11) Municipal use in gallons per capita per day--The total average daily amount of water diverted or pumped for treatment for potable use by a public water supply system. The calculation is made by dividing the water diverted or pumped for treatment for potable use by population served. Indirect reuse volumes shall be credited against total diversion volumes for the purpose of calculating gallons per capita per day for targets and goals.

(12) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the

production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.

(13) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(14) Public water supplier--An individual or entity that supplies water to the public for human consumption.

(15) Regional water planning group--A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.

(16) Retail public water supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.

(17) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

(18) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

(19) Wholesale public water supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

Source Note: The provisions of this §288.1 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384

TITLE 30

ENVIRONMENTAL QUALITY

PART 1

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CHAPTER 288

WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS

SUBCHAPTER A

WATER CONSERVATION PLANS

RULE §288.3

Water Conservation Plans for Industrial or Mining Use

(a) A water conservation plan for industrial or mining uses of water must provide information in response to each of the following elements. If the plan does not provide information for each requirement, the industrial or mining water user shall include in the plan an explanation of why the requirement is not applicable.

(1) a description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal;

(2) until May 1, 2005, specification of conservation goals, the basis for the development of such goals, and a time frame for achieving the specified goals;

(3) beginning May 1, 2005, specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by industrial or mining water users under this paragraph are not enforceable;

(4) a description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0% to be used in order to measure and account for the amount of water diverted from the source of supply;

(5) leak-detection, repair, and accounting for water loss in the water distribution system;

(6) application of state-of-the-art equipment and/or process modifications to improve water use efficiency; and

(7) any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) Beginning May 1, 2005, an industrial or mining water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and

ten-year targets and any other new or updated information. The industrial or mining water user shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group.

Source Note: The provisions of this §288.3 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384

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Appendix C
Water Use Diagram

Water Use Diagram
Poca Agua Manufacturing Company

[Insert water use diagram here. Show all water uses, sources, and flowrates.]

Appendix D
Board Resolution Adopting the Water Conservation Plan

[Insert Board resolution adopting the water conservation plan.]

Appendix E
Letter to the Region C Water Planning Group

[Insert letter to the Region C Water Planning Group.]