City of Henderson
Parks and Recreation Department

Drought Response Plan Summary

June 5, 2003

This document is a response to the
2003 Southern Nevada Water Authority Drought Plan.

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A. City of Henderson Proposed Ordinance

B. Listing of CCS Sites

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Background

Drought occurs when existing water supplies cannot meet established demands. The Southern Nevada Water Authority (SNWA) and its members receive more than 90% of their water supply from the Colorado River, via Lake Mead. During the period of 2000 to 2002, the average flow of the Colorado River had the lowest three-year average since record keeping began in 1906. Additionally, Lake Mead Water levels have dropped 60 feet in two years. These conditions have been aggravated by decreased conservation levels, high water consumption, and inefficient water use.

Due to the increasing threat of Drought conditions, the SNWA created the January 2003 Drought Plan as a supplement to the 2002 SNWA Water Resources Plan. The City of Henderson City Council adopted the SNWA Drought Plan in March 2003. The accompanying ordinance is expected to be adopted in June 2003.

To comply with the SNWA's Drought Plan and the associated City of Henderson ordinance, the City of Henderson Parks and Recreation Department has created this Drought Response Plan (DRP). The DRP will outline our water usage reduction goal, and identify pro-active measures to increase water conservation, lower water consumption, and encourage water use efficiency. The implementation of the activities outlined in this document will coincide with the adoption of the City of Henderson Ordinance (**see Exhibit A**) in June 2003 and will continue through all stages of the Drought.

Water Usage Reduction Statement

The City of Henderson Parks and Recreation Department water usage goal is a five percent (5%) annual reduction for calendar year 2003 over calendar year 2002. This goal will apply to all existing community parks.

Sites Covered by the Drought Response Plan

With the exception of the Alternative Watering Schedule (which will apply only to Central Control System sites), the activities outlined in this Drought Response Plan will apply to all City of Henderson Parks. The City of Henderson Parks and Recreation Department has recommended an Alternative Watering Schedule for all CCS sites that meet the requirements of the City of Henderson ordinance.

Ornamental fountains operated by the City of Henderson Parks and Recreation Department would also fall under this Drought Response Plan. Per the "operation of ornamental fountains" section of the City of Henderson ordinance, the use of fountains is prohibited. Two department-operated fountains have been identified on the Corner of Silver Springs and Green Valley Parkway (2). In order to comply with the ordinance requirements, these fountains will be turned off during Drought Watch and Drought Alert status.

Central Control System Standards

Maxicom is a computerized irrigation system that monitors daily weather conditions via automated contact with all CCS sites and the weather station **(see Exhibit C)**. The system then calculates the exact amount of water needed to create appropriate irrigation schedules.

Implementation of the Maxicom computerized watering system began in 1993. Currently, all Maxicom-capable parks have been fitted with system components. As funding and staffing allow, additional parks will have Maxicom components installed. At a total investment of over $1 million dollars, Maxicom is the department's primary water-efficiency tool.

High-tech, computerized Central Control systems such as MAXICOM provide updated and adjusted watering schedules based on ET (**see Exhibit D for more information on ET**). By consistently monitoring and making adjustments for ET and weather conditions, Maxicom enables maximized water efficiency, because puddling and runoff is greatly reduced. Irrigation professionals, landscape architects and homeowners alike endorse this effective method of water scheduling. The ET scheduling method can save water. It is derived from proven turf science, it beats guessing, and it helps establish a usable benchmark schedule.

Because of the water usage efficiencies enabled by Maxicom, the City of Henderson Parks and Recreation has recommended a Alternative Watering Schedule **(see Exhibit D)** for CCS sites (**see Exhibit B)** meeting the requirements of the DRP. All other Park sites will adhere to the City of Henderson's mandatory watering schedule as specified in the ordinance (**see Exhibit A**).

Metering

Each CCS site has been separately metered or has the ability to be separately monitored to track water usage and analyze efficiency. Because of this individualized metering, detailed water usage reports can be generated and analyzed to improve efficiency.

Documentation of Conservation Efforts Establishing Baseline

Historically, the City of Henderson Parks and Recreation Department has placed a high priority on water efficiency and conservation. One of the most effective water-efficiency tools is water usage reporting and analysis. The Parks and Recreation Department currently maintains one year's worth of historical water usage data. Additionally, monthly water reports are generated and analyzed to track efficiency and identify areas for improvement.

As evidence of the department's success in water efficiency, the Parks and Recreation department has been able to achieve decreases in water usage, most recently evidenced by continued reductions in the first quarter of 2003 (**see Exhibit E**).

Irrigation System Efficiency

Irrigation System water usage efficiency is the continued priority of the City of Henderson Parks and Recreation Department. To continually assure maximized irrigation efficiency, a Preventative Maintenance Plan has been created. The plan provides guidelines for the monitoring, maintenance, and repair of the irrigation system (**see Exhibit F**).

Turf Reduction

The Parks and Recreation Department began implementation of the Turf Reduction Program approximately one year ago. Thus far in calendar year 2003, over 50,000 square feet of non-recreational turf have been removed. By the end of calendar year 2004, an additional 270,500 (6.2 acres) or non-recreational turf has been identified for removal (**see Exhibit G**).

Non-recreational turf is defined as "surface layer of ground containing a mat of grass and grass roots that is not related to recreational use". Where appropriate and feasible, the City of Henderson Parks and Recreation Department is dedicated to the removal and re-landscaping of "non-recreational turf" areas in order to reduce water consumption.

The Turf Reduction Plan identifies specific areas of turf to be removed and a schedule for their removal. The identified areas include ornamental turf along streets, parkways and center medians. Grass around governmental buildings will also be considered for removal. Park areas that serve recreational purposes (such as sports fields, large open play areas, or areas that can be used by the public for picnics and family gatherings will be exempt from removal.

It is the intent of the Parks and Recreation Department to continue to provide spaces for the public to use and enjoy, while reducing those areas of turf that are non-recreational.

Employee Training

There are three primary methods to involve Parks employees in water reduction efforts: education, training, and involvement. These methods will begin immediately. First, employees will receive education and information about the drought and our Drought Response Plan at staff meetings.

Second, employees will receive training water efficiency procedures. Employees will also receive re-training on existing procedures such as the Preventative Maintenance plan **(see Exhibit F)**.

Finally, employees will be involved in the water conservation process through distribution of the Water Usage and Turf Reduction reports **(see Exhibits E and G)**.

Reporting

For the past two years, the City of Henderson Parks and Recreation Department has generated and analyzed Water Usage Reports. During Drought Watch, these reports will continue to be used internally to benchmark efficiencies and identify potential areas for improvement. During Drought Alert, these reports will be submitted monthly to the Utility Services Department.

Additionally, we are committed to continuing efforts to reduce non-recreational turf areas. Our Turf Reduction Report (**see Exhibit G**) will provide a tracking and analysis tool to support this effort. These reports are used internally to track completion, benchmark performance measures, and analyze improvements.

New Landscape Development

The following water efficient design standards will be required for all new parks, trails, and other landscaped areas administered by the City of Henderson Parks and Recreation Department:

- Irrigation System Installation to comply with City of Henderson standards as outlined in Parks Operation Manual Section 4.303
- Central Control System (CCS) Installation to comply with City of Henderson standards as outlined in Parks Operations Manual Section 4.304
- Minimal use of non-recreational use turf
- Certified irrigation audit for all turf areas to meet minimum distribution uniformity (DU) standards, as recommended by the Irrigation Association
- Efficient water schedules using water audit results and weather station (ET) data
- Use of native plantings, drought tolerant landscaping, and mulches will be encouraged

The City of Henderson Parks and Recreation Department will review and assess existing parks for water conservation opportunities.

Public Education

The department has created a public education plan to achieve the following goals:

- Educate the public about drought and conservation
- Educate the public about Parks efforts to improve water-efficiency

Parks and Recreation will utilize tools such as park signage, ads and information in the Henderson Happenings publication, traveling displays, and press releases to area newspapers to communicate Drought Response Plan information and Parks conservation information.

Park signage will be an additional public education tool utilized by the department. Information on this signage will include alternative watering schedule information and parks conservation measures. Additional signage will be provided to employees to identify irrigation system testing areas.

A summary of drought response public education activities is outlined in our Drought Response Public Education Plan (**see Exhibit H**).

Conclusion

With the implementation of the water-efficiency activities identified in this Drought Response Plan, the City of Henderson Parks and Recreation Department will continue to achieve major improvements in water conservation.

The Drought Response Plan is the result of our self-assessment of water conservation potential, and includes programs and plans to maximize outdoor water use efficiencies to meet stated water use reduction goals. These items include the Alternative Watering Schedule, the Turf Reduction Program, and the Preventative Maintenance Plan.

With the implementation of this Drought Response Plan, we will be able to:

- achieve maximized water efficiency
- maintain park usability levels
- continue to utilize public resources to their maximum effectiveness
- meet the water conservation goals of the SNWA Drought Plan

Exhibit B

	City of Henderson			
		Central Control System Park Sites		

	PARK NAME	PARK LOCATION	CCS CONTROL IRRIGATION
1	Acacia Park	50 Casa Del Fuego	YES
2	Allegro Park	1023 Seven Hills Drive	YES
3	Arroyo Grande Sports Complex	298 Arroyo Grande	YES
4	Burkholder Park	645 W. Victory Road	YES
5	Discovery Park	2011 Paseo Verde Pkwy.	YES
6	Dos Escuelas	Desert Shadow Trail	YES
7	Green Valley Park	370 N. Pecos Road	YES
8	Hayley Hendricks Park	811 Ithaca	YES
9	Liberty Pointe, HMGC, Pavilion	200 S. Green Valley Pkwy	YES
10	Mission Hills Park	551 E. Mission Drive	YES
11	Morrell Park	500 Harris Street	YES
12	Mountain View Park	1959 Wigwam Pkwy.	YES
13	O'Callaghan Park	601 Skyline Road	YES
14	Paseo Verde Park	1851 Paseo Verde Pkwy.	YES
15	Pecos Legacy Park	150 Pecos Road	YES
16	Puccini Park	1899 Seven Hills Drive	YES
17	River Mountain Park	1941 Appaloosa Drive	YES
18	Roadrunner Park	831 Amigo St	YES
19	Rodeo Park	810 Aspen Peak	YES
20	Russell Road Park	5901 E. Russell Road	YES
21	Silver Springs Park	1950 Silver Springs Pkwy.	YES
22	Sonata Park	1550 Seven Hills Drive	YES
23	Stephanie Lynn Craig Park	1725 Galleria Drive	YES
24	Sunridge Park	1010 Sandy Ridge	YES
25	Trail Canyon Park	1065 trail Canyon Rd.	YES
26	Vivaldi Park	1249 Seven Hills Drive	YES
27	Wells Park	1608 Moser Drive	YES
28	Boulder Highway		YES

Exhibit C

Overview of the MAXICOM Central Control System

The ESP-SAT controllers are one part of Rain Bird's MAXICOM Central Control System (CCS).

The satellite controllers receive commands from the cluster control unit (CCU) and operate stations according to schedules programmed at the central computer.

The MAXICOM Central Control System chiefly consists of seven parts:

1. Central Computer - uses MAXICOM software program to control the entire irrigation system

2. Computer Data Path - transfers information from the central computer to the CCU by phone communication or by radio/ direct communication

3. Cluster Control Unit - operates field devices by executing commands received from the central computer.

4. Satellite Data Path - transfers information from the cluster control unit to the field devices by a two-way path (TW) or by MAXILink radio communication.

5. Field Devices - include either satellite controllers or decoders (satellite controllers send a 24 VAC power signal to each station and decoders - control and monitor system functions).

6. Stations - consist of irrigation valves, sensors, or switch-operated devices.

7. Weather Station - interprets weather conditions and sends information to the central computer.

MAXICOM Central Control System

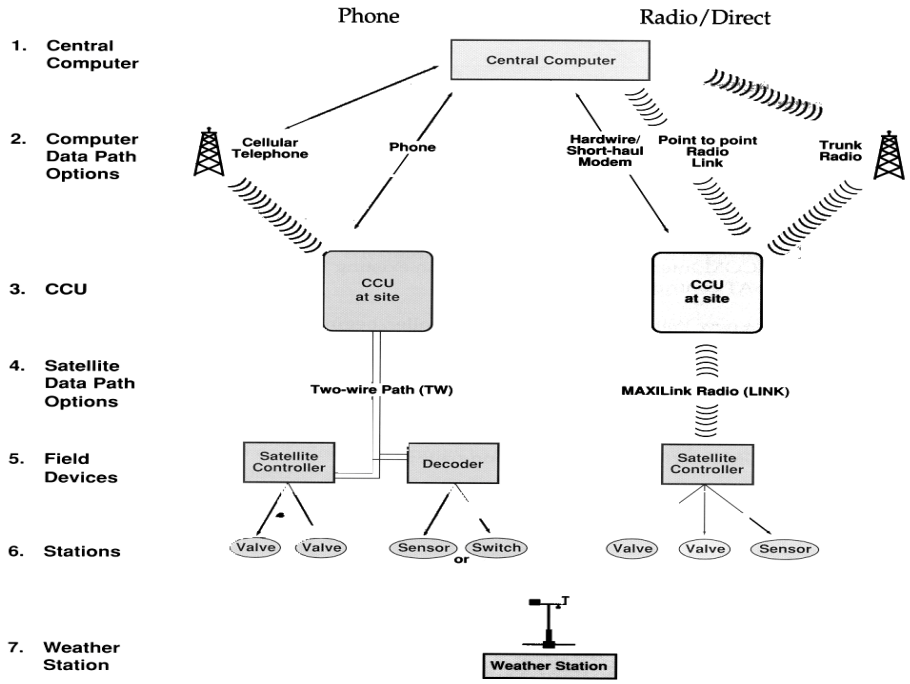

EXHIBIT D

CITY OF HENDERSON
PARKS AND RECREATION
DEPARTMENT

ALTERNATIVE WATERING SCHEDULE PROPOSAL

APRIL 28, 2003

A Place To Call Home

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Modeling of Water Scheduling Impacts on Irrigation Run Times & Field Usabiility

Modeling of Water Scheduling Impacts on Water Efficiency

Historical 2002 ET

Water Usage Report/Efficiency Evidence

BACKGROUND

Drought occurs when existing water supplies cannot meet established demands. The Southern Nevada Water Authority (SNWA) and its members receive more than 90% of their water supply from the Colorado River, which flows into Lake Mead. During the period of 2000 to 2002, the average flow of the Colorado River had the lowest three-year average since record keeping began in 1906. Additionally, Lake Mead Water levels have dropped 60 feet in two years. These conditions have been aggravated by decreased conservation levels, high water consumption, and inefficient water use.

Due to the increasing threat of Drought conditions, the SNWA created the January 2003 Drought Plan as a supplement to the 2002 SNWA Water Resources Plan. The City of Henderson City Council adopted the SNWA Drought Plan in March 2003. The accompanying ordinance is expected to be adopted in June 2003.

One of the primary directives in the SNWA Drought Plan is the implementation of mandatory watering days. In order to maintain the currently efficient levels of water usage, The City of Henderson is recommending the allowance of alternative watering schedules for community recreational use areas over 5 acres(parks) that utilize Maxicom.

MAXICOM

MAXICOM is a centralized computer program that governs irrigation schedules by utilizing weather and soil conditions in order to maximize watering efficiency. The implementation of this system has allowed the City's irrigation system to be managed in the most efficient way possible, resulting in annual reductions in water usage.

MAXICOM operates by adjusting and providing the exact amount of water needed daily to respond to ET (evapo-transpiration) rates. ET rates are determined by weather conditions such as wind velocity, temperature, humidity and sunlight (see next section for additional information about 'ET'). MAXICOM automatically monitors ET, and then adjusts water application accordingly.

MAXICOM minimizes runoff because it matches the application rate with the infiltration rate of the soil. A 20-minute watering cycle can be broken up into four, five-minute cycles that will help prevent runoff. The system will pause, allowing the water to percolate into the soil for a pre-set amount of time before starting the next cycle ("Cycle-Soak Feature"). The system also facilitates multi-station operations, which may shorten total run times and watering windows.

Thus far, the Maxicom system represents $1 million dollar investment by the City of Henderson Parks and Recreation Department. This investment has resulted in increased water efficiencies and decreased water waste, while maintaining park and field usability levels.

ET (EVAPO-TRANSPIRATION)

"Use "ET" to Save Water"

What is ET? Today's irrigation systems use a CONTROLLER, which is an automatic timer that regulates when and for how long your sprinklers run, depending on the watering schedule you enter. **An automatic controller, set properly, is much more efficient than operating sprinklers manually**.

A PROGRAM is a set of instructions that tells the controller exactly when to run the sprinklers. It consists of WATERING DAYS, START TIMES, and RUN TIMES. If your lawn needs one inch of water per week to stay healthy, how do you set the program? What do I base my Run Time on? Yes, irrigation scheduling can be quite a challenge.

The key to this scheduling is what is known as ET Scheduling. "ET" stands for ***evapotranspiration***. Water in the soil evaporates and plants transpire, or use water, daily. Hence the term, "ET". Let's say that you live in a hot, dry climate, and it is now the middle of July. Your turfgrass needs ¼ inch of water per day to stay healthy. Your evapotranspiration rate is 0.25 inches per day. This is the amount or depth of water that needs to be replaced by the irrigation system.

High-tech, computerized Central Control systems (such as MAXICOM) provide updated and adjusted schedules based on ET. Irrigation professionals, landscape architects and homeowners alike, want this quick and easy solution to scheduling. **The ET scheduling method can save water. It is derived from proven turf science, it beats guessing, and it helps establish a usable benchmark schedule**.

This information in this section is a paraphrased article from
http://www.rainbird.com/landscape/technical/articles/scheduling.htm.

PROPOSAL FOR ALTERNATIVE WATERING SCHEDULE

Some agencies will be able to increase water efficiency with the imposition of mandatory watering schedules. The City of Henderson Parks and Recreation Department is in a unique situation because it is already achieving water efficiency through the deployment of the MAXICOM system.

The City of Henderson is proposing the allowance of alternative watering schedules for community recreational use areas (parks) that are under the Maxicom system and meet certain other water efficiency criteria. All none CCS-sites would adhere to the mandatory watering schedule requirement. The benefits of a alternative watering schedule to the City of Henderson Parks and Recreation Department are:

1. Continued Water Efficiency

The City of Henderson has the same goal as the SNWA: water conservation. We are fully committed to this. Our priority is the continued achievement of water use reductions through the use of Maxicom and other water efficiency tools such as our Turf Reduction program and Water Usage Reporting and Analysis.

For our department, the imposition of mandatory watering days will have the opposite effect of creating water use efficiency. In fact, if the City of Henderson is forced to comply to a mandatory watering schedule, we may actually INCREASE water usage.

If the City of Henderson utilizes the proposed watering schedule and water use is restricted to certain days, "stacking" of ET will occur. This "ET stacking" will result in prolonged water windows, some in excess of 18 hours. This stacking will result in the inefficient use of water, increased runoff, and increased levels of water usage. **If we are allowed to operate under a alternative watering schedule, we will be able to maintain and potentially increase the current water efficiency levels.**

2. Park Usability

Adherence to a mandatory watering schedule will severely limit the ability of the public to use City of Henderson community park facilities. As previously mentioned, implementation of mandatory watering schedules will result in a "stacking" effect of ET. This stacked ET will create longer watering windows, which will have a negative impact on park and field usability. Longer watering windows can create soggy or underwater athletic fields. Additionally, these longer watering times will mean fields are unusable because irrigation will still be operating. **If we are allowed to utilize a alternative watering schedule, we will maintain the current levels of park and field usability.**

3. Public Accountability

To date, the City of Henderson has spent approximately $1 million dollars on the Maxicom system with the promise of increased efficiencies. If watering days are assigned, this system will be essentially abandoned and we will be using an "on and off" switch to control the irrigation of our parks. As a government entity, we have an obligation to utilize public resources to their maximum effectiveness.

DROUGHT RESPONSE PLAN OUTLINE

The City of Henderson Parks and Recreation Department as outlined the following components/criteria in the departmental Drought Response Plan (DRP) submittal to the purveyor. These components provide evidence of current water efficiency efforts which support implementation of a alternative watering schedule.

1. **Water Usage Reduction Statement**
2. **Sites Covered by the DRP**
   - All Central Control System (CCS) sites
3. **CCS Standards**
   - Scheduling governed by weather station-obtained ET data
   - Automated contact with sites and weather station
4. **Metering**
   - Each irrigation system must be separately metered
5. **Documentation of Conservation Efforts Establishing Baseline**
   - Historical data illustrating one year of water usage , **OR**
   - Results of certified irrigation audit meeting minimum Irrigation Association requirements
6. **Irrigation System Efficiency**
   - Preventative Maintenance Program
7. **Turf Reduction**
   - Turf Reduction Assessment Plan

8. Employee training

- Training program emphasizing water conservation and irrigation preventative maintenance

9. Reporting

- Annual water usage report with the ability to produce monthly reports

10. New Landscape Development

- Water-efficient design standards
- Minimal use of non-recreational use turf
- Certified irrigation audit to meet minimum distribution uniformity (DU) standards as recommended by the Irrigation Association.
- ET-based water schedule using water audit results

11. Public Education

- Signage plan communicating efficiency measures
- Public Information Plan to communicate DRP Information

CONCLUSION

The City of Henderson Parks and Recreation Department has made major strides in increasing water efficiency through the implementation of the MAXICOM system and ET-based scheduling. These tools have allowed the City's irrigation system to be managed in the most efficient way possible, resulting in a decrease in annual water usage from 2002.

Our proposal has outlined MAXICOM system capabilities, described the benefits of ET-based scheduling, and discussed the positive impacts of alternative watering schedules. The City of Henderson Parks and Recreation Department advocates the allowance of alternative watering schedules for those organizations that can meet certain water efficiency criteria.

If we are allowed to utilize a alternative watering schedules, we will continue to achieve water usage efficiencies, maintain park usability levels, continue to utilize public resources to their maximum effectiveness, and meet the water conservation goals of the SNWA Drought Plan.

EXHIBITS

MODELING OF WATERING SCHEDULE IMPACTS ON IRRIGATION RUN TIMES AND FIELD USABILITY USING SEPT 2002 HISTORICAL ET AS BASE

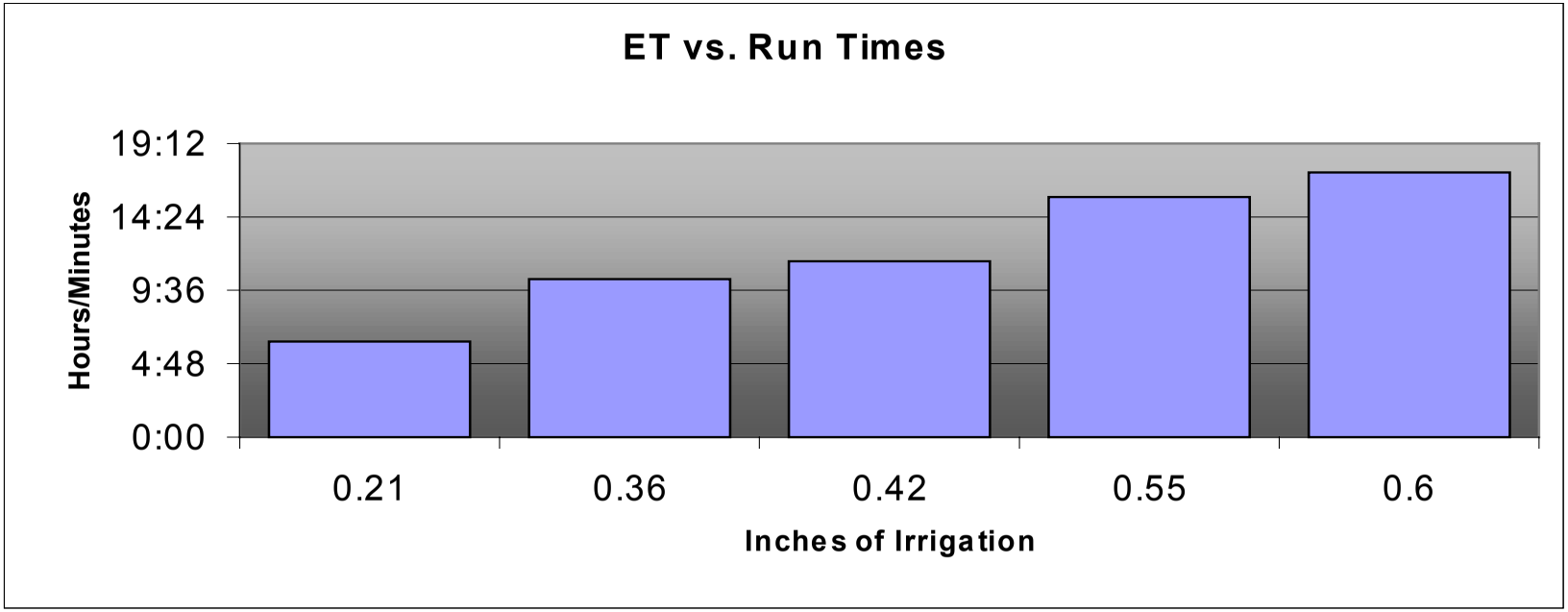
MODEL 1—MANDATORY DAY WATERING SCHEDULE

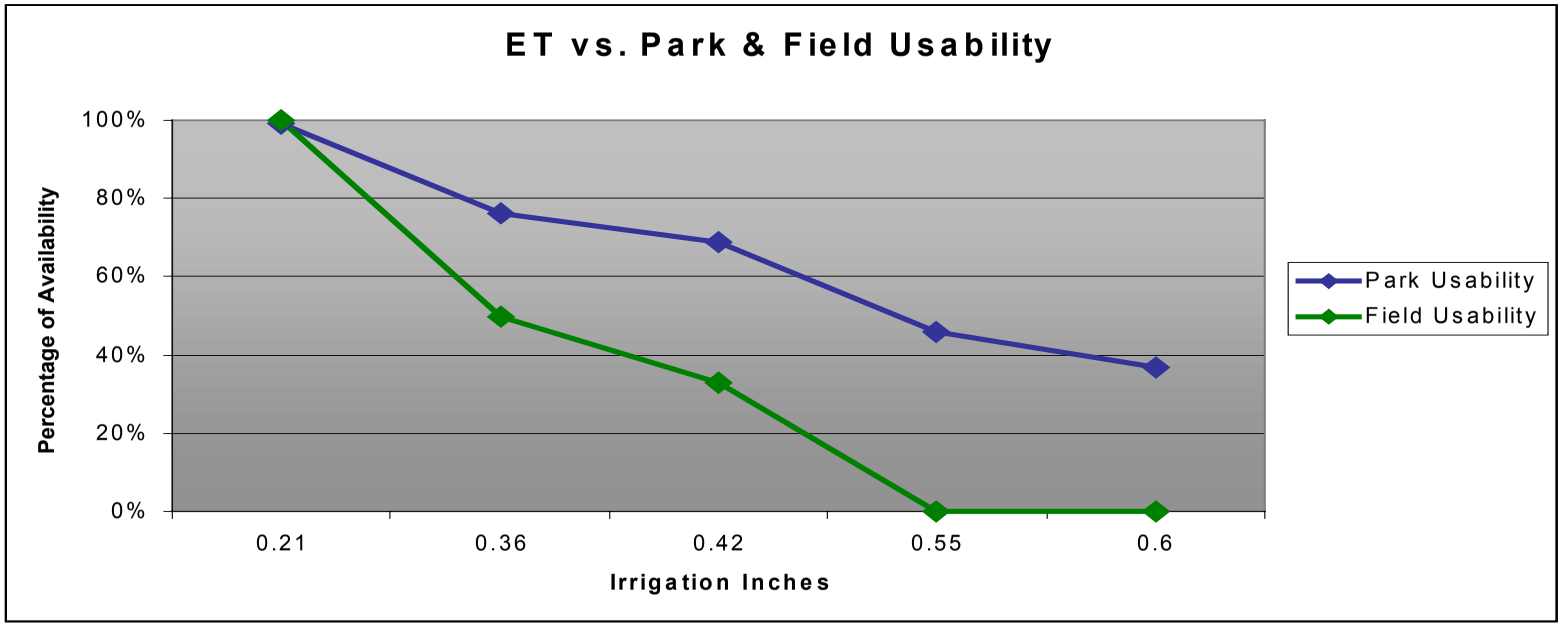
Week	*MON*	*TUE*	*WED*	*THU*	*FRI*	*SAT*	*SUN*	*Total ET*
1	0.55		0.6		0.25	event	0.49	1.89
2		0.44		0.41		event	0.6	1.45
3	0.44		0.48		0.25	event	0.6	1.77
4		0.6		0.5		0.25		1.35
5	0.55							0.55
	*add .3 for Sunday 9/1/02							**7.01 inches of irrigation**

MODEL 2—ALTERNATIVE WATERING SCHEDULE

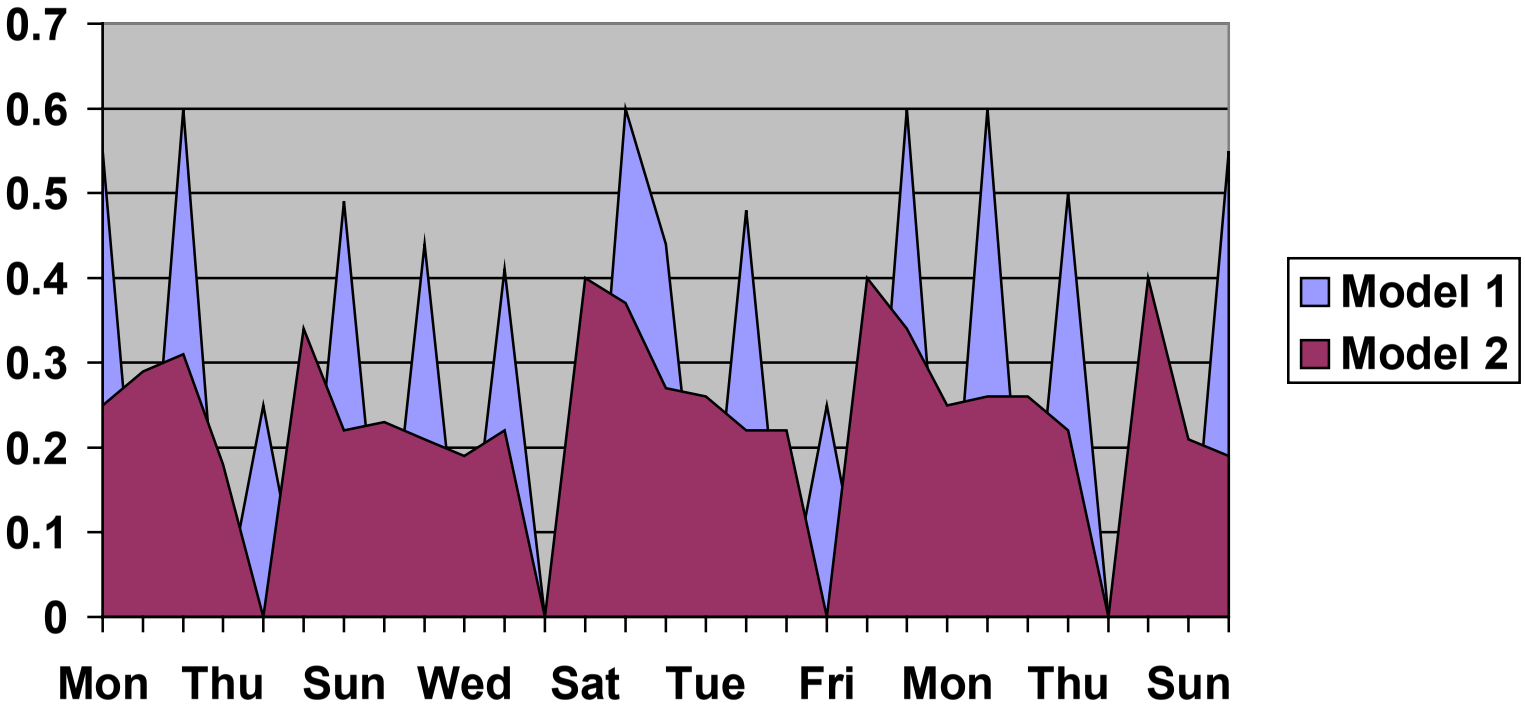
Week	*MON*	*TUE*	*WED*	*THU*	*FRI*	*SAT*	*SUN*	*Total ET*
1	0.25	0.29	0.31	0.18		0.34	0.22	1.59
2	0.23	0.21	0.19	0.22		0.4	0.37	1.62
3	0.27	0.26	0.22	0.22		0.4	0.34	1.71
4	0.25	0.26	0.26	0.22		0.4	0.21	1.6
5	0.19							0.19
	*add .3 for Sunday 9/1/02							**7.01 inches of irrigation**

ET	Run Time	Park Usability	Field Usability
.21	6:16	99%	100%
.36	10:16	76%	50%
.42	11:31	69%	33%
.55	15:42	46%	0%
.6	17:21	37%	0%


ET vs. Run Times
Hours/Minutes
19:12
14:24
9:36
4:48
0:00
0.21
0.36
0.42
0.55
0.6
Inches of Irrigation


ET vs. Park & Field Usability
100%
80%
60%
40%
20%
0%
Percentage of Availability
0.21
0.36
0.42
0.55
0.6
Irrigation Inches
Park Usability
Field Usability

MODELING OF WATER SCHEDULE IMPACTS ON WATER EFFICIENCY



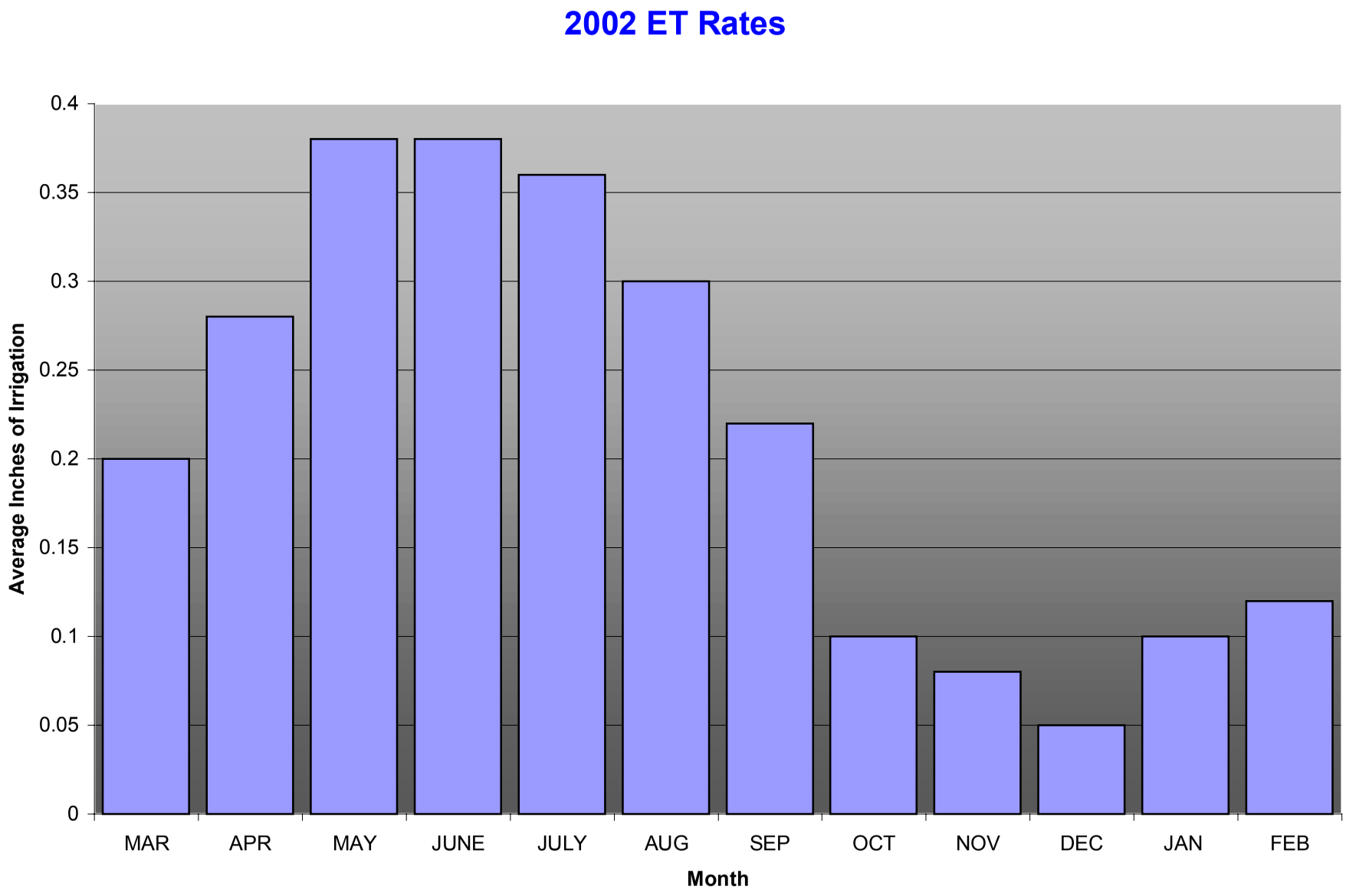

2002 ET Rates
Average Inches of Irrigation
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
MAR
APR
MAY
JUNE
JULY
AUG
SEP
OCT
NOV
DEC
JAN
FEB
Month

Exhibit E

CITY OF HENDERSON PARKS AND RECREATION DEPARTMENT
POTABLE WATER USAGE REPORT FOR THE MONTHS OF
January through April, 2003

	2003 Gallons	2002 Gallons	Gallons %Inc/Dec	2003 Ave Daily Use	2002 Ave Daily Use	Ave Daily Use %Inc/Dec
January	12,233,540	14,594,976	-16%	415,102	482,266	-14%
February	13,275,504	14,606,944	-9%	448,504	467,363	-4%
March	13,102,048	18,412,020	-29%	526,321	622,160	-15%
April	23,888,876	29,269,964	-18%	817,431	1,009,858	-19%
TOTAL	**62,499,968**	**76,883,904**	**-19%**	**2,207,358**	**2,581,647**	**-14%**

CITY OF HENDERSON PARKS AND RECREATION DEPARTMENT
RECLAIMED WATER USAGE REPORT FOR THE MONTHS OF
January through April, 2003

	2003 Gallons	2002 Gallons	Gallons %Inc/Dec	2003 Ave Daily Use	2002 Ave Daily Use	Ave Daily Use %Inc/Dec
January	1,109,236	2,441,472	-55%	35,782	78,757	-55%
February	2,344,980	1,554,126	51%	75,645	50,133	51%
March	1,487,772	2,496,824	-40%	53,135	89,172	-40%
April	1,275,430	5,143,996	-75%	41,140	165,935	-75%
TOTAL	**6,217,418**	**11,636,418**	**-47%**	**205,702**	**383,997**	**-46%**

Note: February increase due to main break on Boulder Highway

Exhibit F

WEEKLY
IRRIGATION SYSTEM PREVENTATIVE MAINTENANCE

1. Operate each zone for a minimum of one complete cycle/rotation. Look for signs of defects, such as:
    - Poor distribution from plugged nozzles
    - Poor pattern or insufficient coverage from incorrectly adjusted screws
    - Distorted patterns from old or worn out nozzles
    - Incorrect sprinkler radius from tilted or incorrectly adjusted heads
    - Water waste from broken sprinklers or pipes
    - Slow rotation and non-uniform distribution patterns caused by slow or non-turning heads
    - Improper water distribution caused by sprinkler heads not at grade (this is critical with higher mowing levels during the summer).
    - Improper water distribution caused by slow or non-operational electrical valves
    - Improper water distribution caused by improperly mixed equipment.
2. Repair or replace any defects discovered during step 1. Remember to always replace heads and nozzles with identical equipment.
3. Check for Matched Precipitation Rate (MPR) on all zones.
4. During irrigation system testing, all field personnel are required to remain on site, in the immediate water testing areas (in accordance with SNWA recommendations).

5. Follow all additional procedures outlined in Parks Operation Manual Section 4.110.

Exhibit G

Turf Reduction
Report
Report Date: April 24, 2003

Completed:

	Removal Date	Location	Amount (Sq. Feet)	Cumulative Total	Water Savings - Gallons	Water Savings - AF
	2003	Boulder Highway	40,000	40,000	**2,480,000**	**7.61**
	2003	Green Valley Area	6,000	46,000	**2,852,000**	**8.75**
	2003	Youth Center Park	2,500	48,500	**3,007,000**	**9.23**
	2003	Morrell Park	3,000	51,500	**3,193,000**	**9.80**
Planned:	by 2004	Horizon & Boulder Hwy	32,000	83,500	**5,177,000**	**15.89**
	by 2004	Boulder Highway Trails	150,000	233,500	**14,477,000**	**44.43**
	by 2004	Warm Springs Turn Ln	27,000	260,500	**16,151,000**	**49.57**
	by 2004	Support Services Bldg	10,000	270,500	**16,771,000**	**51.47**

Notes: Projected Annual Water Savings based on SNWA Study Results of 62 gallon savings per square foot of turf converted to xeriscape

1 AF = 325,851 gallons

EXHIBIT H

CITY OF HENDERSON
PARKS AND RECREATION
DEPARTMENT

DROUGHT RESPONSE PUBLIC EDUCATION PLAN

APRIL 24, 2003

A Place To Call Home

Background

Due to the increasing threat of Drought conditions, the SNWA created the January 2003 Drought Plan as a supplement to the 2002 SNWA Water Resources Plan. The City of Henderson City Council adopted the SNWA Drought Plan in March 2003. The accompanying ordinance is expected to be adopted in June 2003.

In order to comply with the SNWA's Drought Plan and its associated ordinance, the City of Henderson Parks and Recreation Department has created a Drought Response Plan to identify activities that comply with SNWA directives. Additionally, the Response Plan outlines pro-active measures to increase conservation, lower water consumption, and encourage water use efficiency. Drought Response Plan activities will begin in June 2003, and will continue through all stages of the Drought.

Purpose of Public Education Plan

The purpose of this public education plan is two-fold:

- Educate the public about the drought
- Inform the public about Parks water conservation activities and efficiencies

Primary Distribution Channels

- Parks
- Newspaper (Display Ads & reports)
- Utility Bills
- Water Wise (SNWA Publication)
- Television (remotes & reports)
- Recreation Centers/City Hall
- Henderson Happenings
- City Web Site

Plan Matrix

Completion/ Run Date	Channel	Title	Information	Responsibility
Start June 03 June 7 (Nat'l Trails Day)	City Hall/Rec Centers (rotating)	Display Signage (3 rotating/1 admin bldg)	Parks Conservation Activities & Efficiencies	Polly (info) Debra (design & creation)
June 03	Admin. Building/ Rec Centers/ Etc.	Brochures (500)	Parks Conservation Activities & Efficiencies	Polly (info) Debra (design & creation)
June 03	Parks	Park Signage – 24X36 (1 per site) And 18X24 (2 per site) + posts – silk screened & alum. backed	Parks Conservation Activities & Flexible Watering Schedule	Polly (design) Lynn (ordering and distribution)
June 03	Web site	Link/Info	Parks Conservation Activities and Drought	Polly (info) Debra (implement)
June 03, October 03	Utility Bills	Bill Messaging	Park Conservation Blurbs	Polly (info) Sue Regan (implement)
June 03, September 03, December 03	Utility Bills	Inserts	SNWA/City Conservation Efforts	Polly (info) Sherri Collier (implement
June 03, Sept 03, Etc.	Henderson Home News	Utilities Column	Parks Conservation Activities & Efficiencies	Polly & Sue (info) (forward to Elisabeth Trossberg)
Focus Aug 03, Sep 03 Ongoing	Henderson Home News, RJ, View, Television (All Channels)	Press Releases/Stories/ Remotes	Parks Conservation Activities and Drought (highlight MAXICOM and Turf Reduction Program)	Polly (info) Debra (implement)
Aug 03, Sep 03, Etc.	Rec Center Receipts	Messaging	Parks Conservation Activities and Drought	Polly (info) Debra (implement)
Sept 03	Water Wise	Article	Parks Conservation Activities & Efficiencies	Polly & Sue (story)
Fall Issue (deadline July 1) -distribute Aug03	Henderson Happenings	Director's Letter	Mention of Parks Conservation Activities and Drought	Jim(letter) Debra (implement)
Fall Issue (deadline July 1	Henderson Happenings	Center Section (4 pages) & Cover	Parks Conservation Activities and Drought	Polly (info) Debra (implement)