

# Water Conservation Plan



**Utilities, Inc. of Nevada**  
**3670 Grant Drive, #103**  
**Reno, NV 89509**

**Updated**

**March 2013**

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### **APPENDIX A – UIN Drought Plan**

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Utilities, Inc. of Nevada  
Conservation Plan

## 1.0 INTRODUCTION

The Utilities, Inc. of Nevada's (UIN) Water Conservation Plan was developed as a result of the adoption of the Assembly Bill 331 by the Nevada Legislature. This law has been incorporated in Nevada Revised Statutes as NRS 540.131 to 540.151.

UIN serves approximately 3300 customers within a specific service area located approximately 10 miles northeast of Reno, Nevada U.S. Highway 395 at the Nevada / California state line in Cold Springs, NV.

Water conservation is an integral part of a utility's water resource plan. Water conservation can influence customer utility bills, the need for capital projects, drought protection for the community and the rate at which new resources are developed. UIN's mission is to manage its water resources and develop solutions that will ensure adequate future water supplies for its service territory in Cold Springs.

In developing its water conservation strategies, there are several planning objectives which UIN seeks to achieve. They are:

1. Management of water to identify and reduce leakage in water facilities, inaccuracies in water meters, and maintaining low non-revenue water percentage;
2. Specific conservation measures required to meet the needs of UIN's service area;
3. Cooperation with Washoe County and other entities in addressing new developments;
4. Methods of public education to increase public awareness of the limited supply of water in the State and the need to conserve water and encourage the use of plants that are adapted to desert climates; and
5. A contingency plan for drought conditions which ensures a sustainable supply of potable water.

## 2.0 OVERVIEW OF UIN's WATER SYSTEM

### 2.1 UIN WATER SERVICE

UIN serves approximately 3,300 customers, which are primarily residential, within a specific service area located approximately 10 miles northeast of Reno, Nevada in Cold Springs. UIN is the only water utility providing water service in Cold Springs. The service area covers approximately 10 square miles. UIN's water system is made up of four pressure zones served by, two booster stations, four ground level water storage tanks and five groundwater wells located in two hydrographic basins.

Pressure Zone #1 is served by Wells #6 (500 gpm) and #7 (600 gpm) and Storage Tank #1 (420,000 gallons capacity). Pressure Zone #2 is served by Wells #1 (700 gpm) and #2 (30 gpm) and Storage Tank #2 (420,000 gallons capacity). Pressure Zone #3 is served by Booster Station #4 (325 gpm) and Storage Tanks #3 (420,000 gallons capacity) and #4 (1,000,000 gallons capacity). Booster Station #4 pumps water from Tank #4 to Tank #3 which gravity feeds Pressure Zone #3. Booster Station #4 is backed up by the Touraco Booster Station (250 gpm). Pressure Zone #4 is served by Well #8 (AKA Sweger Well, 900 gpm) and Storage Tank #4. Tank #4 is fed by Well #8. All of the wells have chlorinating facilities at the well head. A chlorine residual of approximately 0.5 ppm is maintained throughout the distribution system.

Pressure Zone #1 consists of the area west of US 395 (including Bordertown Casino and RV Park) as well as the Canyon Hills subdivision on the east side of US 395. Pressure Zone #2 consists of the "original Reno Park" area and White Lake Estates. Pressure Zone #3 consists of the Crystal Canyon subdivision. Pressure Zone #4 consists of the Woodland Village subdivision. All of the pressure zones are inter-connected allowing water to be moved from one zone to another in an emergency.

The five wells are telemetry controlled by the water level within the various water storage tanks. As the water level in the tanks drops to a pre-determined level, a signal is sent to the required well calling for the pump to be turned on to supply water to the tank. When the water level reaches a second pre-determined level, another signal is sent to the well to shut it off. The entire water supply, storage, and distribution system can be remotely monitored with the use of laptop computers and the PC Anywhere software program. Additionally, in the event of a well failure, the telemetry system places an automated alarm call to the on call operator.

### **3.0 ROLE OF CONSERVATION IN RESOURCE PLANNING**

The Utilities, Inc. of Nevada's (UIN) water conservation plan outlines prudent and effective water resource management practices within UIN's service area. This plan considers the resources of the Utility as well as the number of customers served by the Utility. To a large extent, this plan relies on the cooperation and the resourcefulness of both customers and the Utility's personnel.

UIN encourages customers to save water because of the resource, economic and community benefits. Therefore, conservation measures are routinely used during normal UIN operations, through system management, regulatory restrictions and public education. Additionally, conservation measures may be increased during periods of drought or when demand exceeds supply capabilities. These conservation measures are used to assure adequate service to all customers. Section 4.3 of this plan further explains and describes the conservation measures. The drought plan in Appendix A lists measures to be considered in case of more severe drought. Appendix A1 is the State of Nevada Drought Plan.

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## **4.0 CONSERVATION GOALS, STRATEGIES AND MEASURES**

### **4.1 BACKGROUND**

Cold Springs has a typical high desert climate with hot summers and arid conditions. Wise use of water enables the utility to optimize use of its existing system. The strategy for reducing demand under drought is somewhat unique in that the majority of the strategies are expected to produce long-term demand reductions, even after drought conditions have subsided. Periodic droughts and system emergencies are more manageable with a water conservation plan in place. These are some of the reasons the Utility recognizes the need to develop a plan for water conservation based upon the climate and the living conditions in its service area.

### **4.2 CONSERVATION GOALS AND STRATEGIES**

This water conservation plan intends to measurably increase water conservation in order to help meet future water needs as they increase due to area growth. The goals of the water conservation plan include:

- Improving the utilization and extending the life of existing facilities;
- Lowering operating costs;
- Avoiding new source development costs;
- Improving drought and emergency preparedness;
- Educating customers about the value of water; and
- Protecting and preserving environmental resources.

While the list of UIN's conservation programs, products and services is diverse, each is a tactical measure in support of one of four major strategies:

- System Management
- Regulation and Policy
- Developing Codes and Policies
- Education and Public Outreach

### **4.3 CONSERVATION MEASURES**

#### **4.3.1 System Management Program**

UIN's conservation success will be partly dependent upon the water management and practices of the individual consumer. There are several key areas related to demand management that are within the power of UIN:

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## **Metering**

Metering is the foundation of sound demand management programs. UIN's water service accounts are 100% metered and also have master meters on each production well. Additionally, UIN meters and monitors consumption of construction water by using portable two-inch meters which can be attached to fire hydrants in accordance with AWWA standards.

## **Meter Replacement**

UIN has implemented a plan to replace meters throughout the water system. The benefit of this process is the detection and repair of leaks from older facilities, including meters, which, in turn, reduces water waste.

UIN estimates it will conserve 2 gpd per person by replacing older meters throughout the system.

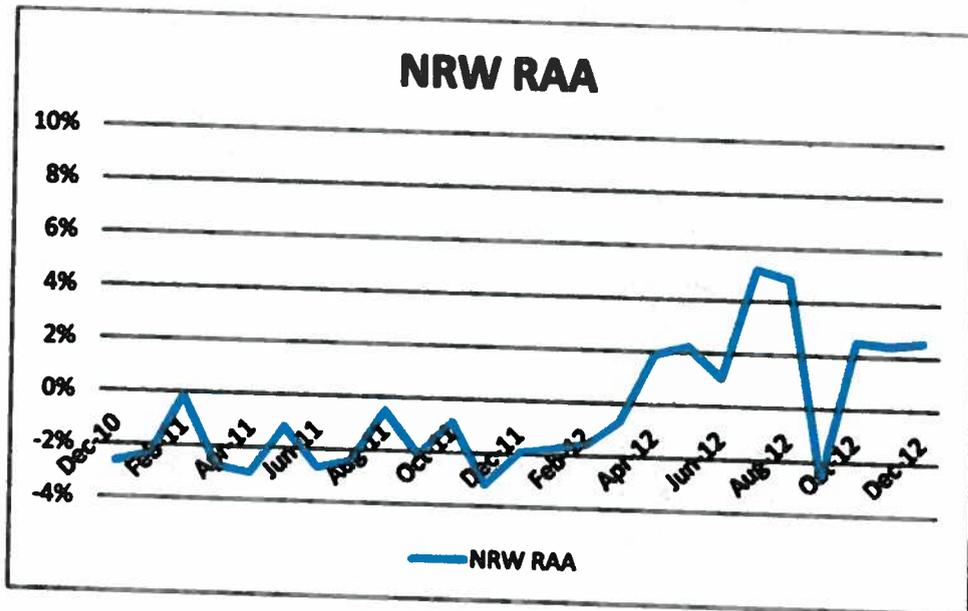
## **Managing Non-Revenue Water**

The term "Non-revenue" Water (NRW) is defined to reflect the distributed volume of water that is not reflected in customer billings. NRW is specifically defined as the sum of Unbilled Authorized Consumption (water for fire fighting, flushing, etc.) plus Apparent Losses (customer meter inaccuracies, unauthorized consumption, systematic data handling errors, etc.) plus Real Losses (system leakage and storage tank overflows). In this way, the term NRW includes the sum of the varied and disparate types of losses and authorized unbilled consumption typically occurring in water utilities.

All water delivery systems experience losses. UIN takes measures in an ongoing effort to limit water losses from the water production process to the water delivery point.

- Well pumps and production meters are monitored and maintained daily.
- Reservoirs are thoroughly inspected weekly to assure integrity against leakage.
- Any line leaks are fixed as soon as possible.
- All leaks are repaired immediately and estimated water loss is recorded.
- Customer meters are monitored monthly for consumption abnormalities.

These efforts to manage non-revenue water by UIN have been extremely successful with no significant water loss.



Fluctuations in NRW occur primarily due to the timing of when production meters (supply) are read in relationship to when customer meters (consumption) are read.

No additional water will be conserved by managing non-revenue water.

#### 4.3.2 Regulatory Program County Planning

UIN will work cooperatively with the Washoe County building department to limit the size of irrigated land in new developments or expanded service and promote the use of water-efficient landscaping and fixtures. (UIN has almost no organic growth with only one service connection in about the last five years.)

UIN's engineer estimates it will conserve 1 gpd per person with this conservation measure.

#### 4.3.3 Developing Codes and Policies

UIN's Water Use Tariffs are the driving force behind the water management program and are reviewed and approved by the Public Utilities Commission of Nevada.

#### Water Rate Setting

In December of 2009, UIN implemented a three tiered rate schedule to increase water conservation. When customers have reached a specified consumption, the rate increases for all usage above the specified volume in gallons. The

increasing tiered rate structure provides greater incentive to high volume water users to conserve. The rates are as follows:

**Residential Water Service (not to exceed 1")**

<u>Usage (gals)</u>	<u>Rate</u>
<5,000	\$0.95 per 1,000 gallons
5001 to 175,000	\$1.60 per 1,000 gallons
>175,000	\$2.44 per 1,000 gallons

UIN's engineer estimates it will conserve 3 gpd per person with this rate schedule.

**Drought Plan**

The UIN Drought Plan, shown in Appendix A, is a set of written protocols that further affect water management in case of drought.

During times of drought, the drought plan will be implemented and UIN's engineer estimates it will conserve 60 gpd per person.

The UIN Tariff No. 1A (Water), Rule No. 8 includes a section on *Apportionment of Supply during Times of Shortage* to support the UIN Drought Plan.

**4.3.4 Education and Public Outreach**

**Public Education and Distribution of Materials**

UIN has identified several venues for continuing public education:

- Utility-Sponsored Town Halls
- PUCN-Sponsored Consumer Sessions
- Public Comment periods at Community Meetings, and Board of County Commissioners (BOCC) Meetings
- Community Expositions
- Community Fairs
- [www.uiwater.com](http://www.uiwater.com)
- Community Newsletters

UIN continues to identify potential venues for public education and does not consider this list to be exhaustive nor inclusive. While all of these events may not be possible, the Utility will continue to make an attempt to provide public outreach at 4 community events annually. In addition, UIN partners with the Nevada Rural Water Association (NvRWA) to coordinate water conservation

education. NvRWA has many materials available for education which have been invaluable to UI Nevada affiliates.

UIN's engineer estimates it will conserve 1 gpd per person through public outreach.

### **Landscape Retrofit**

The landscape retrofit program encompasses promotion of water efficient landscaping in the Spanish Springs Valley primarily through education. In partnership with NvRWA, UIN has developed a guide to water-efficient landscaping with examples of yard designs, irrigation layout, plant selection, and maintenance. In addition, [www.tmwlandscaping.com](http://www.tmwlandscaping.com) website has published a list of plants adapted to arid and semi-arid climates.

UIN's engineer estimates it will conserve 1 gpd per person by promoting water efficient landscaping.

### **Indoor Plumbing**

UIN is a small water system which has limited regulatory authority and finances. Conservation measures involving retrofitting indoor plumbing can be expensive. Furthermore, UIN's growth is developer driven and UIN will work with the developer to promote water efficient fixtures in subsequent developments. As noted in Section 4.3.2, UIN will work with Washoe County to encourage water efficient fixtures.

Most indoor water use can be conserved in the bathroom. Toilets, showerheads and faucets are typically the largest culprits of indoor water waste. UIN will provide instructions for use of dye to determine if a toilet is leaking and will provide information regarding potential water savings from low flow toilets. In addition, UIN will publish on the [www.uiwater.com](http://www.uiwater.com) website a home water audit tool for customers to be able to measure their use and more efficiently manage water consumption.

UIN's engineer estimates it will conserve 2 gpd per person through public outreach.

### **Youth Materials**

UIN will provide information on water conservation and encourage the use of water conservation practices through a variety of youth programs. Contacts through schools can help educate students about the value of water and conservation techniques.

UIN's engineer estimates it will conserve 1 gpd per person by working with educational personnel.

**4.4 CONSERVATION MEASURE IMPLEMENTATION SCHEDULE**

Conservation Measure	2011	2012	2013	2014	2015	2016
<b>System Management Program</b>						
Metering	X	X	X	X	X	X
Meter Replacement			X	X	X	X
System Pressure Standards	X	X				
Managing Non-Revenue Water	X	X	X	X	X	X
<b>Regulatory Program</b>						
County Planning		X	X	X	X	X
<b>Developing Codes and Policies</b>						
Water Rate Setting	X	X	X	X	X	X
Drought Plan		X	X	X	X	X
<b>Education and Public Outreach</b>						
Public Education, Distribution of Kits and Materials		X	X	X	X	X
Landscape Retrofit			X	X	X	X
Youth Materials		X	X	X	X	X

**4.5 INCENTIVES**

Water conservation incentives are defined as methods which motivate water users to implement conservation/efficiency measures. In itself, conservation incentives (like public education) do not directly save a single drop of water; they increase the customer's awareness about the value of reducing water. Increasing public awareness about the value of reducing water may lead to users making behavioral changes which would result in the increased implementation of conservation measures which should directly save a quantifiable amount of water. Conservation incentives are classified into three categories: environmental, financial and regulatory. Examples of water conservation incentives are listed below:

#### **4.5.1 Environmental**

Preservation of water as our natural resource, protection of our natural resource through reduction in pollutants in run-off water, reduced pumping from well(s) containing contaminants such as arsenic, etc. Depleting reservoirs and groundwater can put water supplies, human health and the environment at risk. Lower water levels can contribute to higher concentrations of natural or human pollutants. Using water more efficiently helps maintain supplies at safe levels, protecting human health and the environment.

#### **4.5.2 Financial**

Particularly in difficult economic times, the financial incentives to reduce monthly bills and keep rates from rising (through the need for additional capital investments for tanks and wells) are a powerful conservation incentive. Tiered rates, or inclining block rates, encourage water conservation through increasing the cost per thousand gallons the more water is consumed. UIN will continue to work with the PUCN to implement tiered rates to promote water conservation.

#### **4.5.3 Regulatory**

Through the Utility's regulators, rules can be established which provide added water conservation incentives. As a regulated utility, the Utility will continue to work with the PUCN to include water conservation measures in the Utility's tariff.

### **4.6 MEASURES**

There are many variables which influence water consumption: economic climate, weather, desire to conserve water, rates, conservation awareness, rules and regulations, environmental concerns, peer pressure, etc. A change in consumption can be measured at a point in time, such as from 2011 year end – 2012 year end. However, the change may be influenced by factors which are not a part of the Water Conservation Plan, such as weather or the economy. The success of a water conservation plan may take many years to realize through trending the effectiveness of the plan.

In addition, with a comprehensive Water Conservation Plan, it is difficult, if not impossible, to measure the impact of singular strategies within the plan. However, the overall goal of conserving water can be broken down into two objectives: the reduction of inside-the-wall use and the reduction of outside-of-the wall use. Some of the individual strategies may overlap both of these objectives (such as rate making), others may be directed at one or the other of the objectives (such as Xeriscape or plumbing retrofits). Although, as the vast majority of water service connections are not measured separately between inside and outside use, it is most likely that the overall success of the plan will be able to be measured. Individual water conservation strategies will be measured through estimates based on what data is available.

**Appendix A**

**Utilities, Inc. of  
Nevada**

**Drought Plan**

**March 2013**

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## 1-01. Purpose

Groundwater is one physical resource used to meet water demands in Northern Nevada, but there is a second, tangible resource that is critical to managing and extending those physical resources over time - conservation. Conservation involves no real infrastructure challenges or significant capital costs, yet it effectively provides an additional resource by freeing up water that was previously consumed inefficiently or wasted. In this sense, it is the cheapest source of water available to the community. It is also a resource over which we have complete control, because future availability depends more on our own efforts and less on influences outside the community.

This Plan is intended to establish water conservation measures and enhance efficient utilization of water resources. Water purveyors normally rely on conservation as an essential resource to help meet water needs; however, the existence of drought conditions affecting the Spring Creek Valley Basin mandates additional conservation measures. The UIN Drought Plan is intended to align and support the State of Nevada Drought Response Plan revised April 2012 (Appendix A1).

## 1-02. Definitions

### (a) Community Use Recreational Turf (CURTA)

Any private or public park facility consisting of a turf-dominated, multi-purpose recreational area that:

- (1) Has at least two acres and no dimension less than one hundred feet;
- (2) Is a field that is programmable for athletic or other recreational events.

### (b) Utilities, Inc. of Nevada

Utilities, Inc. of Nevada (UIN).

### (c) Drought

A condition in which the combination of many complex factors acting and interacting with the environment; results in water supplies not being replenished normally. For purposes of this Plan, a "drought" occurs when existing water supplies cannot meet established demands for a period of time.

### (d) Drought Alert

A second-level drought declaration of UIN based upon current or projected reductions in the community's renewable water supply. "The Drought Alert Stage 2 occurs when 50% of more of a county is classified as D2 (drought – severe) or higher in the Drought Monitor for a minimum of two weeks." (State of Nevada, Drought Response Plan, 2012)

(e) **Drought Emergency**

A third-level drought declaration of UIN based upon current or projected reductions in the community's renewable water supply. "The Drought Emergency Stage 3 begins after the Drought Alert Stage. This stage begins when the Drought Response Committee makes a recommendation, based on information from the Tasks Force(s) that a drought should be formally declared for affected counties." (State of Nevada, Drought Response Plan, 2012)

(f) **Drought Critical**

The fourth and most serious drought declaration of UIN based upon current of projected reductions in the community's renewable water supply.

(g) **Drought Monitor**

"The United States Drought Monitor will be applied to counties in the State of Nevada to identify initial stages of drought. As a composite indicator, the US Drought Monitor integrates various types of drought, with a particular emphasis on meteorological, agricultural and hydrological conditions." (State of Nevada, Drought Response Plan, 2012)

(h) **Drought Watch**

A first-level drought declaration of UIN based upon current or projected reductions in the community's renewable water supply. "Drought Watch Stage 1 begins when 50% or more of a county is classified as D1 (drought – moderate) in the State of Nevada's Drought Monitor." (State of Nevada, Drought Response Plan, 2012)

(i) **No Drought**

A condition in which no drought declaration of UIN is in effect.

(j) **Non-potable Water**

**Water not suitable for drinking.**

**(k) Potable Water**

**Water suitable for drinking.**

**(l) Raw Water**

**Non-potable water diverted from a natural source, subjected to minimal or no treatment, and delivered to a user for subsequent treatment or use.**

**(m) Reclaimed Water**

**Municipal wastewater that has been treated to meet all applicable federal, state and local standards for use in approved applications, including without limitation landscape irrigation, construction and industrial cooling. For purposes of this Plan, "reclaimed water" and "recycled water" are equivalent terms.**

**(n) Resort Hotel**

**Any building or group of buildings that is maintained as and held out to the public to be a hotel where sleeping accommodations are furnished to the transient public and that has:**

- (1) At least one bar with permanent seating capacity for more than thirty patrons that serves alcoholic beverages sold by the drink for consumption on the premises;**
- (2) At least one restaurant with permanent seating capacity for more than sixty patrons that is open to the public twenty-four hours each day and seven days each week; and**
- (3) A gaming area within the building or group of buildings.**

**(o) Spray Irrigation**

**The application of water by means of sprinklers or other devices that disperse droplets of water through the air.**

**(p) UIN Tariff or Tariff**

**The Water and Sewer Tariff that has been adopted by UIN and approved by the Public Utilities Commission of Nevada.**

(q) **Water Use Reduction Plan**

A document or documents to be submitted by or on behalf of an applicant in connection with a request to exempt fountains or water features from the prohibitions contained in this Plan. The term includes a plan that is modeled after the Water Efficiency and Drought Response Plan outline or similar document that may have been approved for use by UIN.

(r) **Xeriscape**

A type of landscaping that incorporates drought-tolerant and low water-use plants with an organic or inorganic surface mulch layer as a water-efficient alternative to traditional turf-grass landscaping.

**1-03. Drought plan—Adopted by Reference.**

The Drought plan effective January 1<sup>st</sup>, 2008 and any amendments by UIN, shall serve as the basis for adopting this Plan, and as a guideline in its interpretation. The drought plan was adopted in order to preserve, protect and encourage the conservation of water resources. The plan describes different stages of water supply conditions as follows:

- (a) No drought;
- (b) Drought watch;
- (c) Drought alert;
- (d) Drought emergency;
- (e) Drought critical.

The provisions of this Plan shall apply whenever a drought watch, drought alert, drought emergency or drought critical condition has been declared by UIN and remains in effect. Unless the context otherwise requires, whenever a provision of this Plan does not specify whether it applies to a drought watch, drought alert, drought emergency or drought critical condition, the provision shall apply when any of those conditions are in effect. In the event of conflict between the provisions of this Plan and other applicable ordinances, regulations or the UIN tariff, the most stringent provisions will prevail. However, with respect to any provision of the UIN tariff that is less stringent than the provisions of this Plan, UIN may enforce that provision instead.

In the case of a drought critical condition, the provisions of this Plan pertaining to a drought alert shall continue to apply. However, UIN shall have the authority to adopt additional restrictions which are deemed necessary in order to protect the public health, safety and welfare. Upon the adoption and publication of those

additional restrictions, they shall become binding on water users within the UIN service area.

**1-04. Applicability**

Except as otherwise provided, the provisions of this Plan shall apply to the use of water supplied by the UIN system, including recycled, reclaimed, raw, non-potable and potable water.

**1-05. UIN-Responsibilities.**

Except as otherwise provided in this Plan; UIN shall be responsible for the administration and implementation of the provisions of this Plan. UIN shall be responsible for enforcing its tariff.

**1-06. Standards and Requirements--Waiver Prohibited.**

The standards and requirements set forth in this Plan may not be waived or varied. A request for waiver or variance shall be considered a request to amend the requirements of this Plan. However, UIN may allow an exemption from the requirements or provisions of this Plan when, in UIN's opinion, the exemption will protect the public health, safety and welfare, and will be beneficial to the UIN water system. Examples of activities which may be exempted include hydrant flushing, valve testing, and system maintenance.

**1-07. Wasting Water after Notice Given.**

It is unlawful for any owner, occupant, or manager of real property served by a water provider to waste water after a notice of water waste has been issued. The waste of water includes without limitation the following:

- (a) Allowing water to flow or spray into a public street, alley, right-of-way, gutter or drain; and
- (b) Failure to repair a water leak.

It is unlawful for anyone to permit the excess use, loss or escape of water through a break, leak or malfunction in the water user's plumbing or distribution facilities for any period of time after the excess use, loss or escape should have been reasonably discovered and corrected.

Where public sewer is available, swimming pool water, when drained, must be discharged into an approved-type receptor and subsequently into a public sewer in accordance with applicable laws and regulations.

**1-08. Violation—Prima Facie Evidence**

Any waste of water or other violation of this Plan, together with proof that the waste or violation originated or took place at any particular residence or place of business, shall constitute, in evidence, a prima facie presumption that the owner, current occupant, or manager of real property of such residence or place of business was responsible for the waste or other violation.

**1-09. Water Curtailment—UIN Tariff 1A (Water)**

In accordance with tariff Rule 8, Section C – During time of threatened or actual water shortage, the Utility will apportion its available water supply among its Customers in a manner that appears most equitable under the circumstances then prevailing, and with due regard to public health and safety.

**1-10. Spray Irrigation—Frequency Allowed Violation**

It is unlawful to use water for the spray irrigation of turf, gardens, trees, grass, shrubbery, or other vegetation in residential areas, or for the spray irrigation of turf other than community use recreational turf on a day other than one designated by UIN. Enforce existing conservation tariff, which allows watering on odd-even days depending on street address, and prohibits outside watering during the hours of 1:00 p.m. to 7:00 p.m.

**1-11. Water Restrictions—Exemptions**

The following are exempt from the watering restrictions described in Section 1-10 above:

- (a) Hand watering for the purpose of preserving lawn or shrubbery so that vegetation does not die;
- (b) Irrigation of new lawns or re-seeding of an existing lawn, for a period of thirty days from the date of planting or installation;
- (c) Drip and/or bubbler irrigation systems, provided that they are not run more frequently than would be permitted for spray irrigation;
- (d) Irrigation of commercial stock by commercial gardens or plant nurseries that are licensed, provided that the licensee or a representative is personally on the premises at the time the irrigation is taking place;
- (e) Testing of landscape irrigation systems, provided that the person performing the test is present to observe system performance;
- (f) Municipal operations or procedures that are necessary to protect the health, safety and well-being of the public; and
- (g) Such other activities as may be exempted under the UIN tariff.

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**1-12. Watering of Community Use Recreational Turf**

The watering of community use recreational turf and turf at other government facilities shall be in accordance with the UIN tariff and any watering schedules adopted or approved there under.

**1-13. Landscape Materials—Generally**

Landscape materials shall be limited as described in Sections 1-14 and 1-15 of this Plan. Landscape materials that were approved in connection with the approval of a land use application or permit for construction that was granted before August 1, 2003, are not subject to the limitations contained in those Sections.

**1-14. Drought Watch Provisions**

During drought watch conditions:

- (a) Single-family and multifamily developments are prohibited from installing new turf in common areas of residential neighborhoods. This restriction shall not apply to turf area to be installed in public parks or privately owned and maintained parks, including required usable open space in residential developments, provided that such turf area has no dimension of less than ten feet.
- (b) The installation of new turf in non-residential developments is prohibited, unless specifically permitted by the approval of a land use application or permit for construction. Any new turf permitted shall be limited to no more than fifty percent of the turf that would be permitted under non-drought conditions. This restriction shall not apply to schools or to public or private parks.

**1-15. Drought Alert Provisions.**

During drought alert conditions:

- (a) No new turf may be installed in residential front yards. In single-family residential development, the installation of new turf shall not exceed fifty percent of the gross area of the side and rear yard or one hundred square feet, whichever is greater (up to a maximum of five thousand square feet). No turf area may be installed in the side or rear yard if any dimension thereof is less than ten feet.
- (b) During the months of May through August, the planting of cool-season grasses (i.e. tall fescue or rye grass) is prohibited. The planting of warm-season grasses (i.e. bermuda and zoysia) is permitted.
- (c) The restrictions applicable to nonresidential development during drought watch conditions shall apply during drought alert conditions as well.

**1-16. Cooling System Provisions**

During drought watch and drought alert conditions, outdoor mist cooling systems are not restricted within residential development. In commercial operations, outdoor mist cooling systems relating to animal safety are permitted, but those relating to human comfort are permitted only during the months of June, July, and August, and only between the hours of twelve noon and ten p.m.

**1-17. Washing Paved Surfaces, Buildings and/or Equipment**

The washing of paved surfaces, buildings, and/or equipment (other than vehicles) is prohibited unless the water is discharged to a sanitary sewer in accordance with applicable laws and regulations or is contained on site.

**1-18. Washing Personal and Commercial Vehicles**

Under drought watch and drought alert conditions, the washing of personal vehicles upon residential properties is limited to once per week per vehicle and requires a positive shut-off nozzle. Commercial vehicles may be washed without limitation as to frequency, but only:

- (a) At a commercial facility in accordance with applicable laws and regulations, or;
- (b) By means of a high-pressure, low volume sprayer using less than ten gallons per vehicle.

**1-19. Potable or Non-potable Water Utilization—Prohibitions and Exceptions**

- (a) Fountains and water features are prohibited upon property that is serviced by UIN. The following features, however, are exempt from this prohibition:
  - (1) Swimming pools;
  - (2) Fountains and water features that are supplied by privately-owned water rights, by water rights obtained by means of a State-issued permit, or by nuisance water discharged during normal facility dewatering;
  - (3) Not more than one fountain or other water feature at any single-family residence, provided that the surface area of the fountain or other water feature does not exceed two hundred square feet during a drought watch condition, or twenty-five square feet during a drought alert condition;
  - (4) Not more than one fountain or other water feature within the common areas of a single-family or multi-family development, provided that the fountain or other water feature is not an entryway

- or streetscape feature and its surface area does not exceed two hundred square feet during a drought watch condition, or twenty-five square feet during a drought alert condition;
- (5) Fountains or water features that are necessary and functional components serving other allowable uses, such as storage ponds on a golf course or aeration devices;
  - (6) Fountains or water features within public parks and public or private recreational water parks, provided that the fountains or water features have a recreational function and are not merely decorative;
  - (7) Indoor water features, or features with the majority of the total water volume contained indoors or underground. If practical alternatives exist for separating indoor and outdoor components, they shall be separated and managed accordingly. (Example: timers on shut-off valves);
  - (8) Fountains or water features necessary to sustain aquatic animals, provided that the animals have been actively managed within the water feature prior to the declaration of drought.
- (b) The following fountains or water features may be exempted from the prohibition contained in Subsection (A) in accordance with the remaining provisions of this Section:
- (1) Fountains or water features that are integral to the operation of a resort hotel or a coalition of resort hotels; or
  - (2) Other fountains or water features that are proposed to be allowed in exchange for water use reduction activities in accordance with Subsection (D) of this Section.
- (c) In order to be eligible for an exemption pursuant to Subsection (B), an applicant must submit a request for exemption and a water use reduction plan. The request for exemption must be submitted in writing to UIN for consideration. The water use reduction plan must be submitted to UIN, and must contain such information, and be in a format, that is satisfactory to UIN. Any exemption shall be conditioned upon the posting of one or more signs in proximity to the exempted fountain or water feature stating that the fountain or water feature is operating in compliance with this Plan and that a water use reduction plan is on file with UIN.
- (d) The granting of any exemption pursuant to Subsection (B)(2) of this Section shall be subject to the following conditions:
- (1) The fountains or water features for which an exemption is sought must not be operational at the time the exemption is applied for, except as permitted in Subsection (F) of this Section;
  - (2) The submitted water use reduction plan must provide for a minimum total water savings of greater than fifty times the consumptive use of the operation of the fountain or water feature;

- (3) The water use reduction plan must have been submitted to UIN and implemented by the applicant;
- (e) In order to continue to operate any fountain or water feature that is integral to the operation of a resort hotel or a coalition of resort hotels, that is prohibited by Subsection (A) of this Section, and that is in operation on the effective date of the this Drought Plan, a request for exemption and water use reduction plan must be submitted within ninety days after the effective date of this Drought Plan. If the exemption is not approved, the fountain or water feature may not be operated except as permitted in Subsection (F) of this Section.
- (f) Nothing in this Section that prohibits or limits the operation of fountains or water features shall be deemed to:
  - (1) Prohibit the construction of fountains or water features; or
  - (2) Require a fountain or water feature to be drained if maintaining a re-circulating water pool is necessary in order to maintain pumps, pond liners, and ancillary equipment, but in such a case the re-circulating water pool may only be operated between the hours of one a.m. and four a.m.
  - (3)

**1-20. Private Covenant, Condition, Restriction, Deed Clause—Enforcement**

No person or association may impose or enforce any private covenant, condition, restriction, deed clause or other agreement to prevent a person from utilizing water efficient landscaping, including without limitation Xeriscape, provided such landscaping receives appropriate architectural review approval. In any event, landscaping materials and designs may not be prohibited solely on the basis that they make use of water-efficient landscaping.

**BRIAN SANDOVAL  
GOVERNOR**

**STATE OF NEVADA  
DROUGHT RESPONSE PLAN**



**Revised April 2012**

**DEPARTMENT OF CONSERVATION  
AND NATURAL RESOURCES,  
DIVISION OF WATER RESOURCES**

**STATE CLIMATE OFFICE**

**DEPARTMENT OF PUBLIC SAFETY,  
DIVISION OF EMERGENCY  
MANAGEMENT**

RECEIVED  
MAY 10 2012

## Executive Summary

This State Drought Response Plan establishes an administrative coordinating and reporting system between agencies to appropriately respond and provide assistance to address drought and mitigate drought impacts. After outlining the significance of drought and types of drought encountered, this Plan identifies a system used in monitoring the magnitude, severity and extent of drought within the state on a county-by-county basis. It establishes a framework of actions based on three stages of responding to drought: Drought Watch (Stage #1), Drought Alert (Stage #2) and Drought Emergency (Stage #3).

The Drought Response Committee, comprised of representatives from the State Climate Office, Division of Water Resources and Division of Emergency Management, is involved throughout each of these stages and is responsible for monitoring drought conditions, collecting data associated with drought, overseeing intergovernmental coordination, disseminating information, reporting to the Governor and working with the State Emergency Operation Center on drought response (if applicable). The Drought Response Committee may establish *ad hoc* Task Force(s). Members of Task Force(s) will serve as experts in the drought affected region, serve as liaisons to local or federal government and collect needed information about the actual and/or projected impacts of the drought. If a drought reaches Stage #3 Drought Emergency, upon the decision of the Governor, the Division of Emergency Management may activate the State Emergency Operations Center. This Center will be advised by the Drought Response Committee, making drought response policy recommendations as needed, supporting local drought emergency response efforts and carrying out the Governor's policies.

  
Jason King, P.E., State Engineer  
Division of Water Resources

  
Christopher B. Smith, Chief  
Division of Emergency Management

  
Kate A. Berry, Director  
State Climate Office

NOV 28 2011

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STATE ENGINEER

## **1. Drought**

**Drought is a complex physical and social phenomenon of widespread significance. While lower than normal precipitation is usually the cause of specific problems creating a drought situation, a drought condition is not simply a lack of rainfall or snow accumulation but can also be related to deficiencies in soil moisture and groundwater; lack of surface water in streams and rivers; and/or reduction of surface water stored in lakes and reservoirs. A number of factors are involved in determining if a drought exists and its severity for a given region: precipitation, snowpack, soil moisture, streamflow, surface water storage and groundwater levels.**

**Drought is not usually a statewide phenomenon; differing situations in the state make drought local or regional in focus. Despite all the problems droughts have caused, drought has proven difficult to define. There is no universally accepted definition because drought, unlike flood, is not a distinct event and drought is often the result of many complex factors acting on and interacting within the environment. Complicating the problem of a drought definition is the fact that drought often has neither a distinct beginning nor end. It is recognizable only after a period of time and, because a drought may be interrupted by short spells of one or more wet months, its termination is difficult to recognize. The most commonly used drought definitions are based on: 1) meteorological and/or climatological conditions, 2) agricultural problems, 3) hydrological conditions and 4) socioeconomic considerations. Each type of drought will vary in severity, but all are closely related and caused by lack of precipitation. These drought types may overlap and are not always unique. Drought type descriptions are from the National Drought Mitigation Center at the University of Nebraska, Lincoln.**

### **1.1 Meteorological Drought**

**Meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region. For example, some definitions of meteorological drought identify periods of drought on the basis of**

the number of days with precipitation less than some specified threshold. This measure is only appropriate for regions characterized by a year-round precipitation regime such as a tropical rainforest, humid subtropical climate or humid mid-latitude climate. Other climatic regimes are characterized by a seasonal rainfall pattern. Extended periods without rainfall are common in many places so definitions based on the number of days with precipitation less than some specified threshold is unrealistic in these cases. Other definitions may relate actual precipitation departures to average amounts on monthly, seasonal or annual time scales.

### **1.2 Agricultural Drought**

Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels and so forth. Plant water demand depends on the prevailing weather conditions, the biological characteristics and growth stage of the specific plant and the physical and biological properties of the soil. A good definition of agricultural drought should be able to account for the variable susceptibility of crops during different stages of crop development, from emergence to maturity. Deficient topsoil moisture at planting may hinder germination, leading to low plant populations per hectare and a reduction of final yield. However, if topsoil moisture is sufficient for early growth requirements, deficiencies in subsoil moisture at this early stage may not affect final yield if subsoil moisture is replenished as the growing season progresses or if rainfall meets plant water needs.

### **1.3 Hydrological Drought**

Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, groundwater levels). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow and groundwater

and reservoir levels. As a result, these impacts are out of phase with impacts in other economic sectors. For example, a precipitation deficiency may result in a rapid depletion of soil moisture that is almost immediately discernible to agriculturalists, but the impact of this deficiency on reservoir levels may not affect hydroelectric power production or recreational uses for many months. Also, water in hydrologic storage systems (e.g., reservoirs, rivers, groundwater) is often used for multiple and competing purposes (e.g., flood control, irrigation, recreation, navigation, hydropower, wildlife habitat), further complicating the sequence and quantification of impacts. Competition for water in these storage systems escalates during drought and conflicts between water users increase significantly.

#### **1.4 Socioeconomic Drought**

Socioeconomic definitions of drought associate the supply and demand of some economic good with elements of meteorological, hydrological and agricultural drought. It differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts. The supply of many economic goods, such as water, forage, food grains, fish and hydroelectric power, depends on weather. Because of the natural variability of climate, water supply is ample in some years but unable to meet human and environmental needs in other years. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. In most instances, the demand for economic goods is increasing as a result of increasing population and per capita consumption. Supply may also increase because of the improvement in production efficiency, the advancement in technology or the construction of reservoirs that increase surface water storage capacity. If both supply and demand are increasing, the critical factor is the relative rate of change. Is demand increasing more rapidly than supply? If so, the vulnerability to and the incidence of drought may increase in the future as supply and demand trends converge.

## **2. Drought Monitoring System**

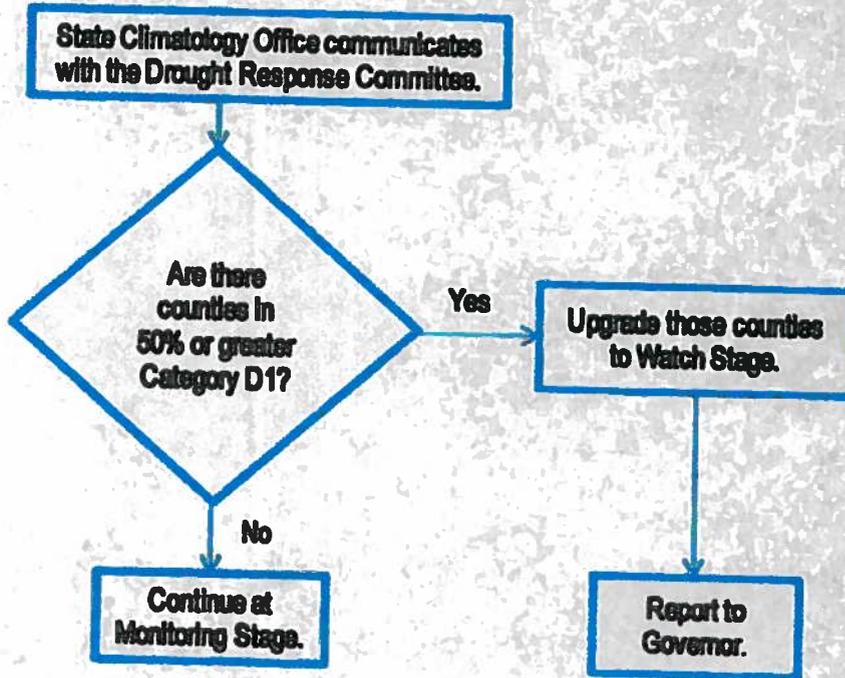
The U.S. Drought Monitor will be applied to counties in the State of Nevada to identify the initial stages of drought. Conditions indicated by the Drought Monitor will be assessed for counties as the primary political sub-units within the state. The Drought Monitor is an independent and scientific approach that synthesizes multiple drought indices, taking into account meteorological and/or climatological conditions, agricultural problems and hydrological conditions along with other available information. As a composite drought indicator, the US Drought Monitor integrates various types of drought, with a particular emphasis on the meteorological, agricultural and hydrological conditions. Issues posed by socioeconomic conditions may also be taken into account when moving into the third drought stage outlined in the following sections. The Drought Monitor is updated weekly, coordinated through the National Drought Mitigation Center at the University of Nebraska, Lincoln, with input and support from a number of federal, state and local partners nationwide. There are five drought intensity categories identified in the Drought Monitor:

- D0** Abnormally Dry
- D1** Drought - Moderate
- D2** Drought - Severe
- D3** Drought - Extreme
- D4** Drought - Exceptional

### 3. Measures Initiating Action

The Drought Response Committee is comprised of a representative from the Office of the State Climatologist, the Division of Water Resources and the Division of Emergency Management. Drought Response Committee members remain in contact and, if it is determined that a Watch Stage exists for any counties, then the Nevada State Climatologist will call a meeting of the Drought Response Committee. Reports to the Governor are generated by the Drought Response Committee whenever there is a change in drought stage and throughout Drought Alert and Drought Emergencies stages.

#### Ongoing Monitoring

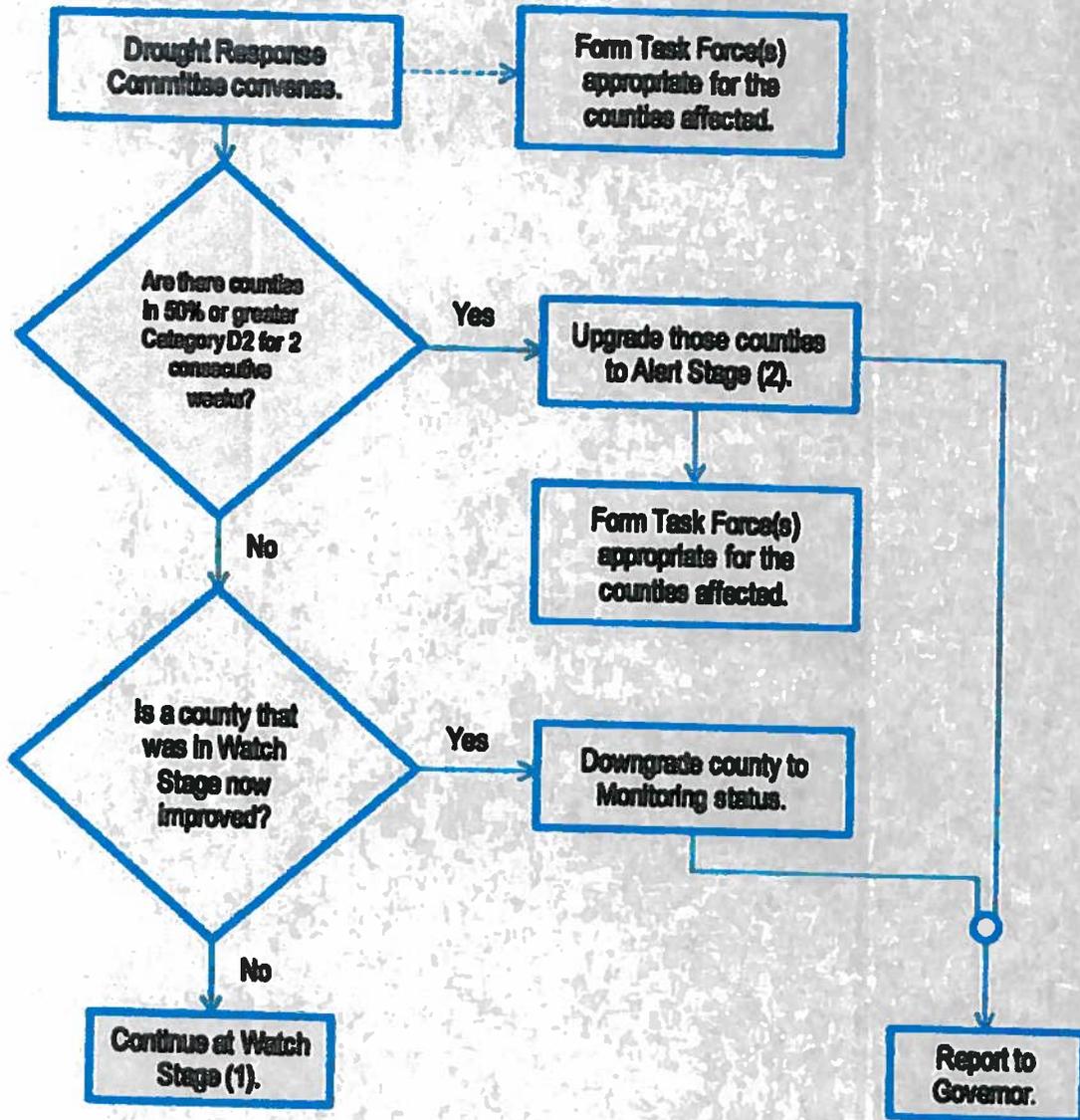


### **3.1 Drought Watch Stage**

**The Drought Watch Stage (Stage #1) begins when 50% or more of a county is classified as D1 (drought – moderate) in the Drought Monitor. During the Drought Watch Stage, the Drought Response Committee will assemble to monitor conditions within the area. The Drought Response Committee will monitor trends and serve as sources of technical information for state and local decision-makers, as well as for the public and media. The Drought Response Committee is composed of the directors (or their designees) of the State Climate Office, the Division of Water Resources, and the Division of Emergency Management. The chair of the Drought Response Committee will be the director of the State Climate Office.**

**Drought Impact Task Forces are *ad hoc* groups formed by the Drought Response Committee to act as experts in the drought affected region, serve as liaisons to local or federal government and provide information needed for dissemination to decision-makers and stakeholders. Task Forces may be expanded or restricted as needed to suit the needs of the situation. Multiple small Task Forces (coordinated through the Drought Response Committee) may be more effective than a single large Task Force. This formation is optional at the Drought Watch stage, but is likely to be necessary at the Drought Alert Stage.**

# 1. Drought Watch Stage

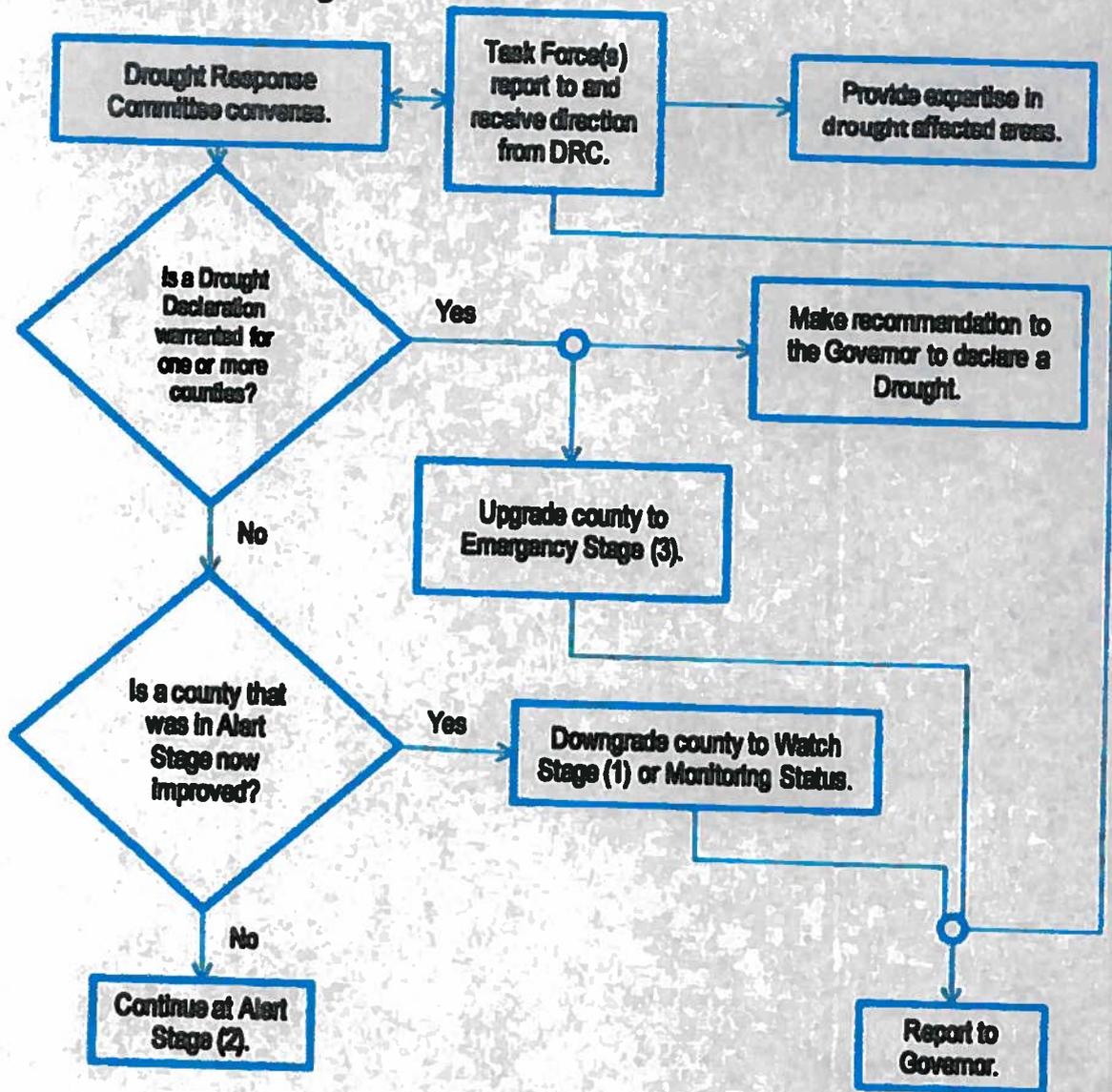


### **3.2 Drought Alert Stage**

The Drought Alert Stage (Stage #2) occurs when 50% or more of a county is classified as D2 (drought - severe) or higher in the Drought Monitor for a minimum of two weeks. The Drought Response Committee will appoint the appropriate Task Force(s), on an *ad hoc* basis, in this stage. Task Force members must be able to speak for their agencies or organizations and have authority to make reasonable commitments toward effective cooperation and coordination. A Task Force may assess actual and projected impacts on the state's economy, agriculture and/or fish and wildlife resources in the area impacted by the drought. The chair of a Task Force will report regularly to the Drought Response Committee with details concerning the drought extent, magnitude and impacts and will provide information about drought mitigation measures being taken by public agencies or private individuals or organizations.

The Drought Response Committee will monitor the progress of Task Forces, and evaluate the adequacy of data collection, procedures, and reports. Further, the Drought Response Committee will collate information from individual Task Forces in order to develop its own assessments, projections and trends. The Drought Response Committee will oversee intergovernmental coordination, including federal agency actions, and make timely reports on the status of the drought and response activities to the Governor, other state leaders, the media and the public.

## 2. Drought Alert Stage



### **3.3 Drought Emergency Stage**

The Drought Emergency Stage (Stage #3) begins after the Drought Alert Stage. This stage begins when the Drought Response Committee makes a recommendation, based on information from the Tasks Force(s) and other sources, that a drought should be formally declared for affected counties. The Drought Response Committee determines whether a critical situation exists or when it becomes obvious that existing state resources and strategies are insufficient to deal with the growing problems and needs. Upon making the recommendation, the Drought Response Committee alerts the Governor that identified portions of the state are experiencing a Drought Emergency.

The issue of whether to formally declare a drought is both controversial and important. The State of Nevada will approach formal declaration with caution. Formal designation may not substantially reduce economic impacts in drought affected areas but may cause serious economic impacts on tourism, agriculture, finance and other industries within the state. Unless a drought situation is expected to be of extreme magnitude, the safest approach is to aid county and local governments in determining their own situations. In many cases existing networks and processes of public agencies, water system managers and experts are available to assess and address particular needs. The criteria for such a recommendation is not as rigidly defined as it is for earlier stages, since the need is dictated by local and specific conditions and based on reporting and recommendations of the Drought Response Committee and Task Force(s). The declaration of a Drought Emergency signifies that conditions are present that may produce negative impacts in certain counties or regions. The Drought declaration may be a trigger point for federal resources. If the drought conditions persist to an extraordinary level, it may negatively impact a county to the point that it exhausts local resources available to respond to the emergency, the affected county may elect to execute a disaster declaration.

In the Drought Emergency Stage, the Drought Response Committee prepares a press release for the Governor. The Governor then may activate the State Emergency Operations Center (SEOC). The SEOC will be overseen by the Chief of the Division of Emergency Management (or designee) and will coordinate with the director (or their designees) of the Nevada State Climate Office and the State Engineer of the Nevada Division of Water Resources as lead responsible agencies, so that continuity of response efforts is maintained.

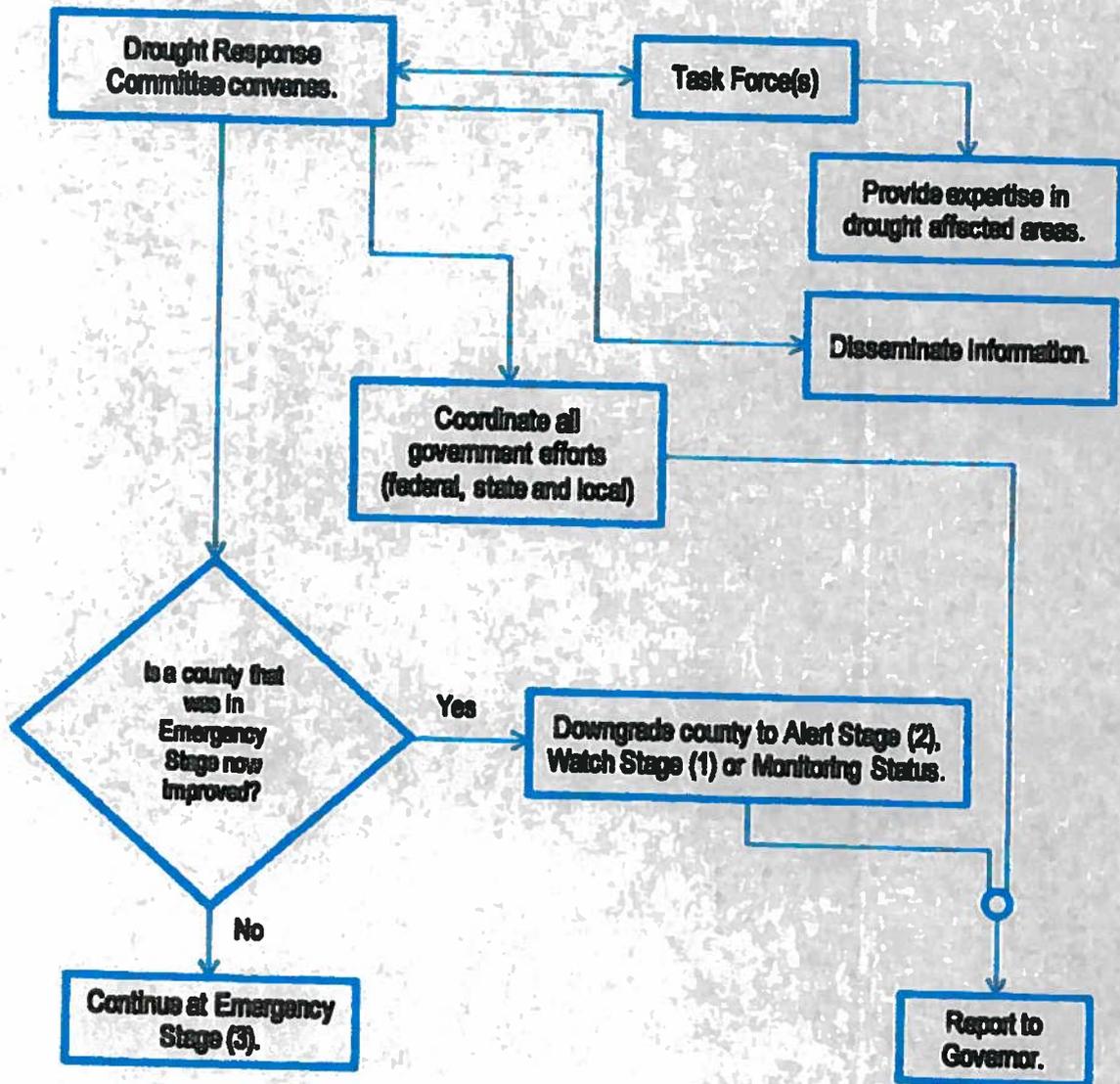
**Under a Drought Emergency declaration the Division of Emergency Management, acting in its authority in accordance with Nevada Revised Statute (NRS) 414 and the State Comprehensive Emergency Management Plan (SCEMP), will coordinate state response efforts and make mitigation, response and recovery recommendations to affected counties. The Division of Emergency Management coordinates the state's resources through the SEOC to support local drought emergency response efforts and to carry out the Governor's policies. The Division of Emergency Management may also request support and resources from federal agencies such as the U.S. Department of Agriculture, Bureau of Reclamation and Federal Emergency Management Agency and from non-governmental organizations, such as the American Red Cross, as needed based on the drought conditions and needs of the local jurisdictions.**

**Upon activation, the SEOC assumes a number of drought related responsibilities, including interagency and intergovernmental coordination and media relations. The SEOC reviews recommendations to address unmet needs from the Drought Response Committee and Task Forces and develops strategies to coordinate the delivery of resources through state mutual aid, state agencies, federal agencies and non-governmental organizations. During the Drought Emergency stage, the SEOC directs the initiatives of the Drought Response Committee and Task Force(s). The Drought Response Committee will continue assessment activities and will provide advice and support to the SEOC, making drought response policy recommendations as needed through the duration of the drought. During the Drought Emergency Stage, Task Force(s) will provide recommendations on possible mitigation solutions along with their assessments of the situation both to the Drought Response Committee and to the SEOC.**

**The SEOC provides general policy direction and as appropriate makes policy recommendations to the Governor for his disposition (such as emergency funding requests and suggested legislative action). The SEOC may advise the Governor on the use of his emergency powers, including any requested data to support the Governor's request, if necessary, for a Secretarial or Presidential Disaster Declaration. The Governor sets the state's priorities, drought mitigation, response and recovery policy and resource allocation direction based on information and recommendations given to the Governor by the Drought Response Committee and the needs of the affected local jurisdiction, county or tribe. The Governor engages with the state**

legislature when new authority and funding are necessary. If needs exceed the resources of the State, the Governor may request Federal Disaster Assistance. Federal assistance that does not need state action should be implemented when necessary without going through the Center.

### 3. Drought Emergency Stage



### **3.4 End of Drought**

**As the drought subsides and the emergency passes, if continuing assistance requirements can be met within normal state administrative channels, the Center prepares a press release for the Governor to declare the end to the drought emergency. Prior to disbanding, the Center will prepare and issue a final report on its activities to the Governor. When the Center disbands, the Drought Response Committee again assumes primary responsibility for response activities and for interagency and intergovernmental coordination until all counties of the state are out of the drought alert and drought watch stages. Before disbanding, the Drought Response Committee will prepare and issue a final report to the Governor and appropriate agencies.**

#### **4. Local Planning for Droughts**

The state encourages local agencies and organizations to prepare for droughts, develop drought plans and to share information about drought preparation and planning. Local drought plans may provide strategic or operational responses to droughts. Other plans may be designed to identify proactive measures that may minimize drought and its consequences.

NRS § 540.141 requires that a water conservation plan, which must be adopted under NRS § 540.131 by a supplier of water as defined under NRS § 540.121, have a provision relating to a contingency plan for drought that ensures a supply of potable water. NRS § 704.662 requires that a public utility furnish a water conservation plan to the Public Utilities Commission, and NRS § 704.6622 requires that such a plan must include a provision relating to a contingency plan for drought that ensures a supply of potable water.

Saving

WATER, TIME and MONEY



through

**XERISCAPE**<sup>TM</sup>

**Prepared by:**  
**Teresa Taylor, Ph.D.**  
**Nevada Rural Water**  
**Association**



Funding for preparation of Xeriscape materials made possible through a grant to the National Rural Water Association through the USDA Farm Services Agency. Nevada Rural Water Association is an equal opportunity employer and provider.

# What IS XERISCAPE?



The term “**XERISCAPE**”  
(pronounced ‘zera-scape’) was  
developed in Colorado in 1981  
in response to a prolonged  
drought.



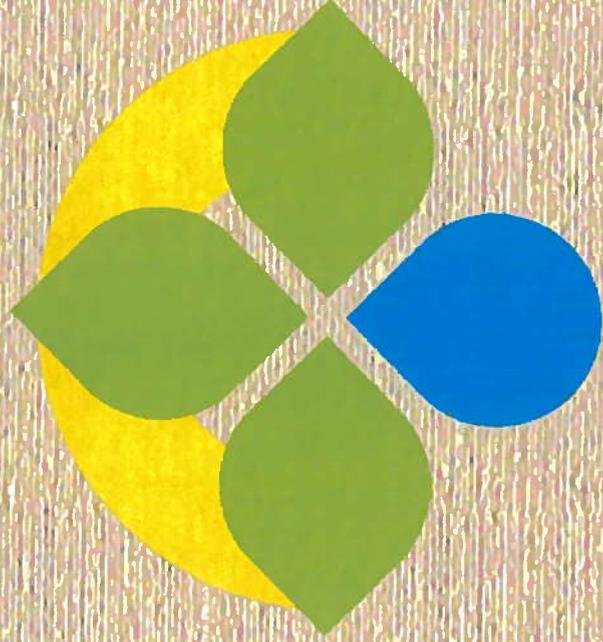
It comes from merging the  
Greek word **Xeros** (“Dry”)  
with the English word  
**Landscape**.



Xeros + Landscape  
 (“scape”) =

**XERISCAPE**

The term is now a trademark, along with the stylized logo of 3 green leaves and a blue water drop:



**XERISCAPE™**

What **XERISCAPE** is **NOT**:



Dry  
only:



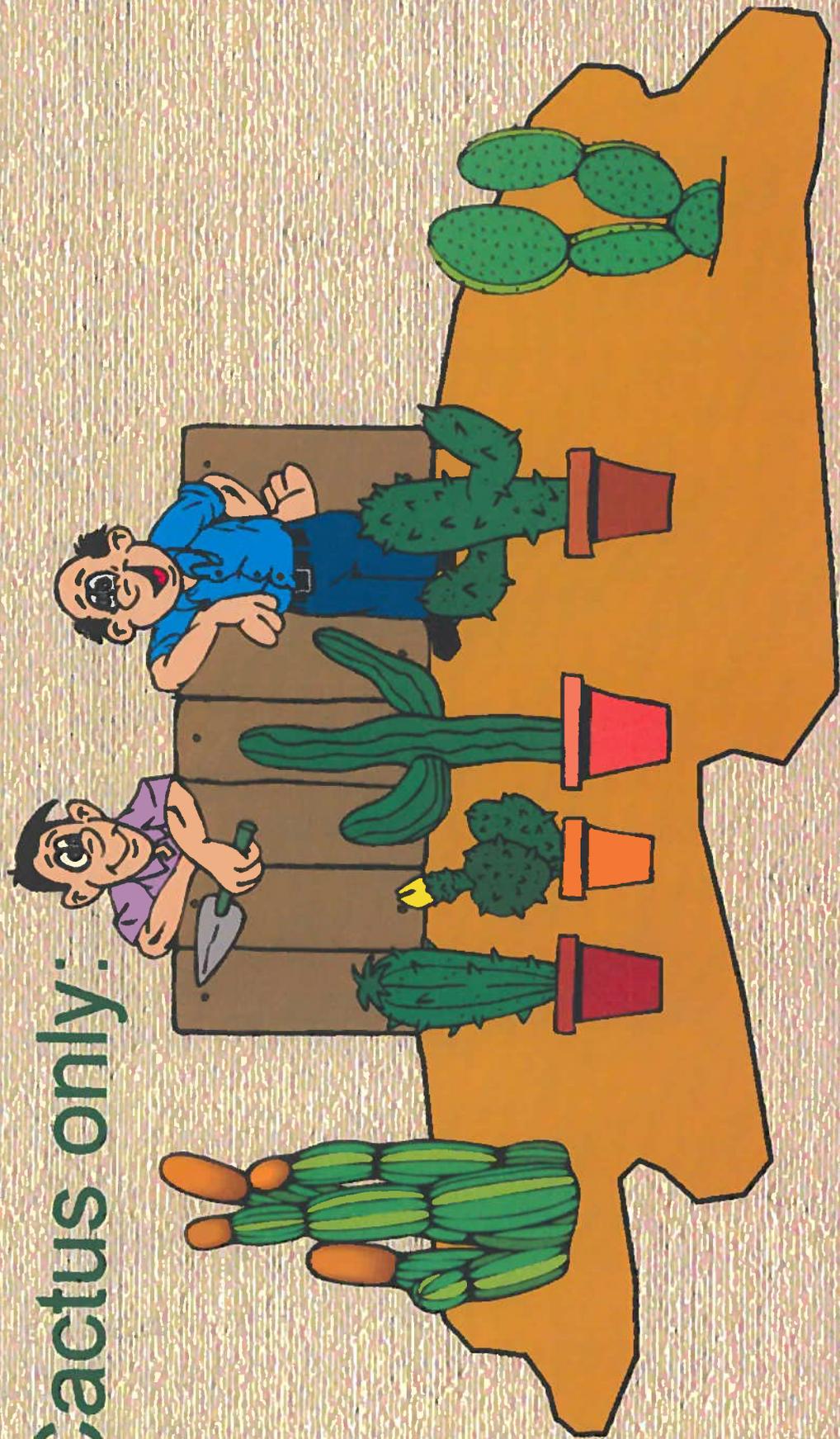
What **XERISCAPE** is **NOT**:

**Rocks**  
**only:**



What **XERISCAPE** is **NOT**:

Cactus only:



What **XERISCAPE** is **NOT**:

“Native  
plants”  
only:

(weeds!)



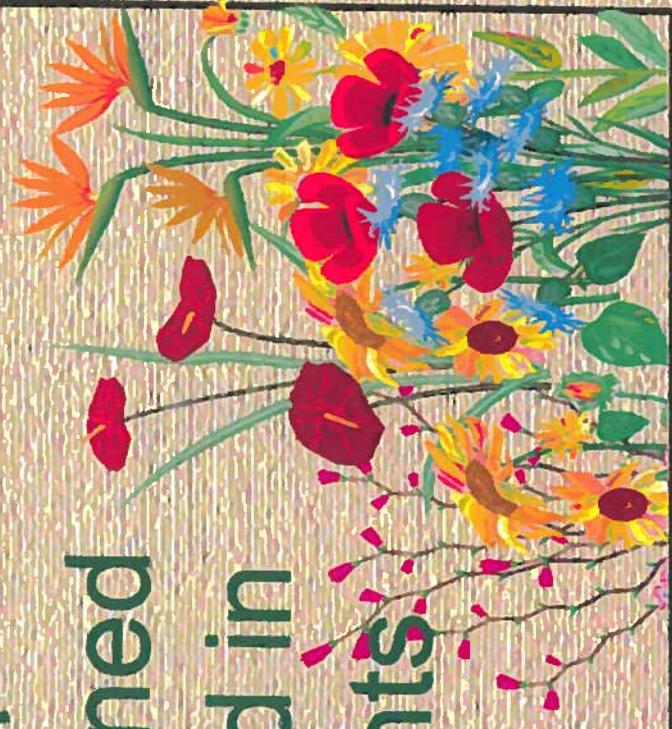
What **XERISCAPE** is **NOT**:

“Lawnless”:



Although the term “xeric” implies no added water, it was never intended to mean that.

By definition, the term **XERISCAPE** was coined to mean water applied in well-controlled amounts and locations.



**XERISCAPE** is **NOT** "Lawnless"  
landscaping!

It **IS** "Less-lawn"  
landscaping!



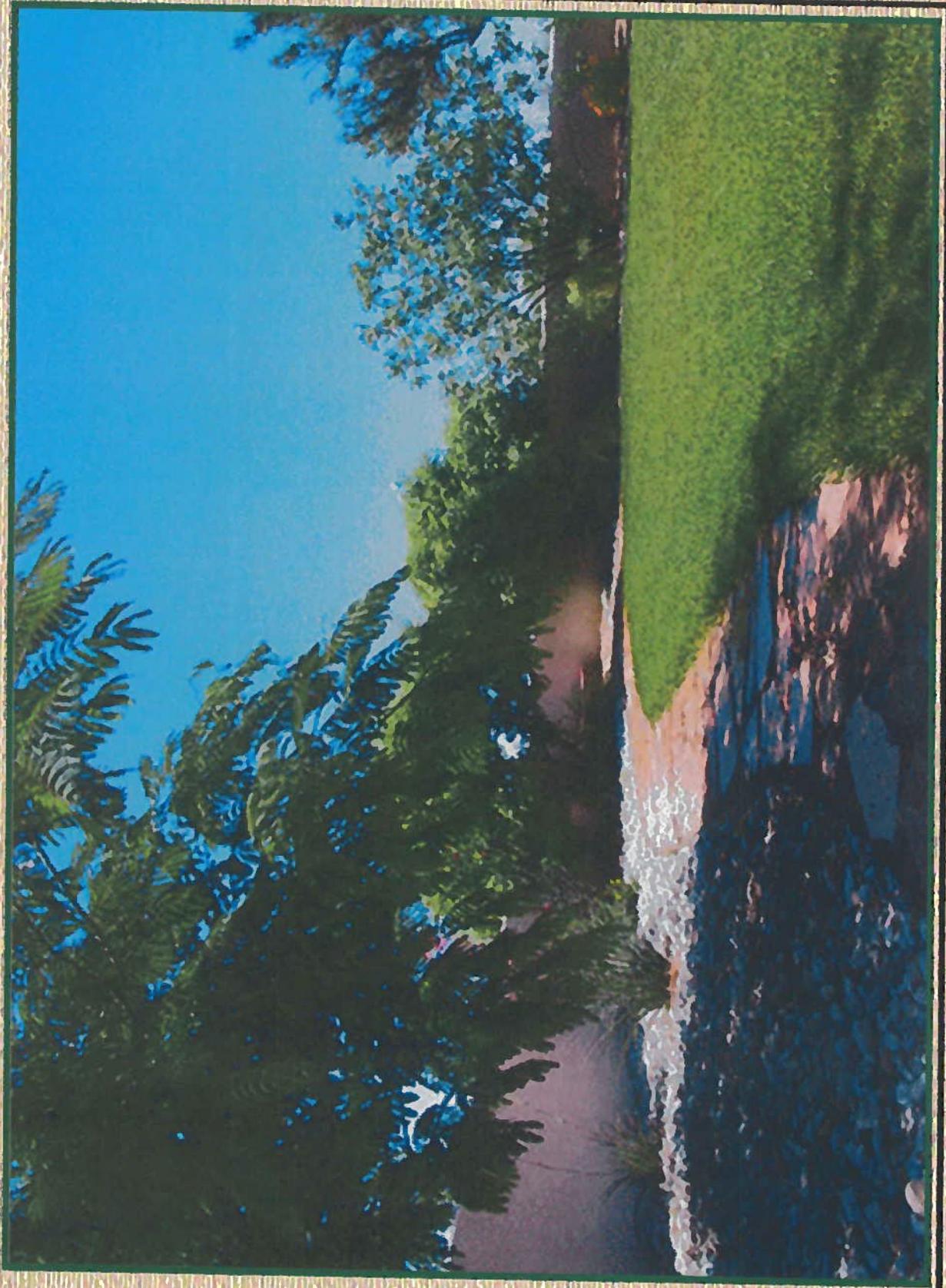
# Examples of XERISCAPE:



# Examples of XERISCAPE:



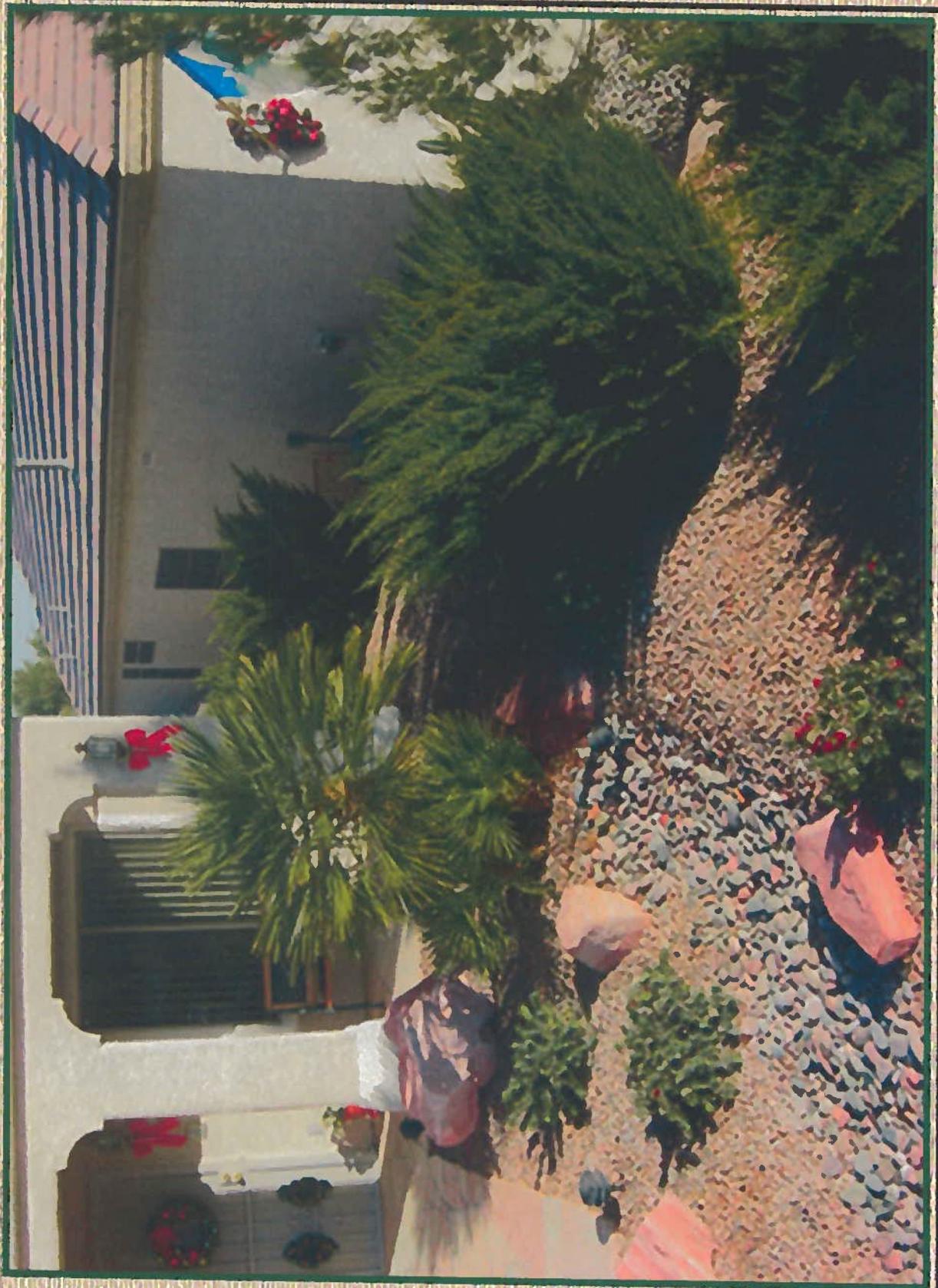
# Examples of XERISCAPE:



# Examples of XERISCAPE:



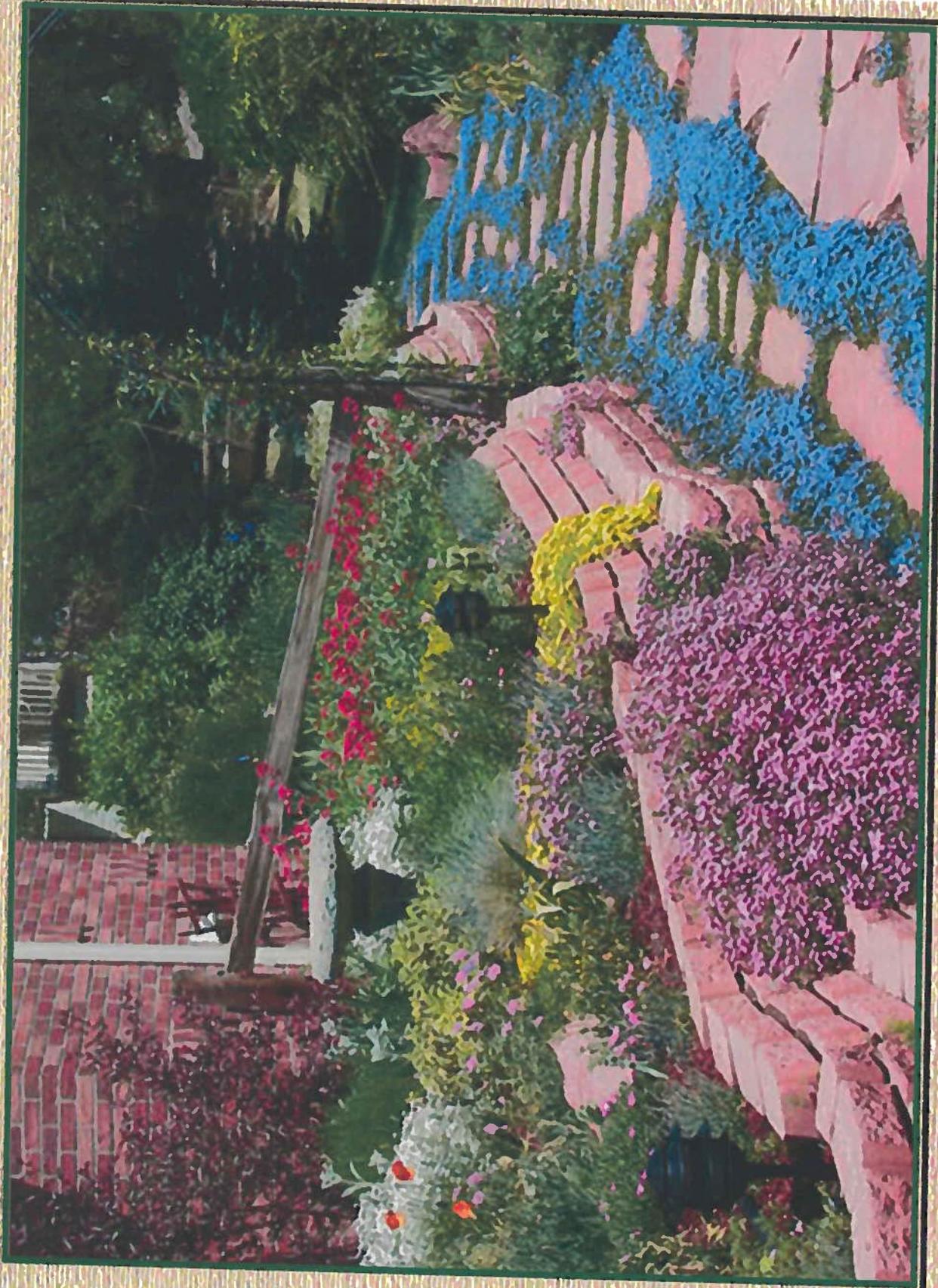
# Examples of XERISCAPE:



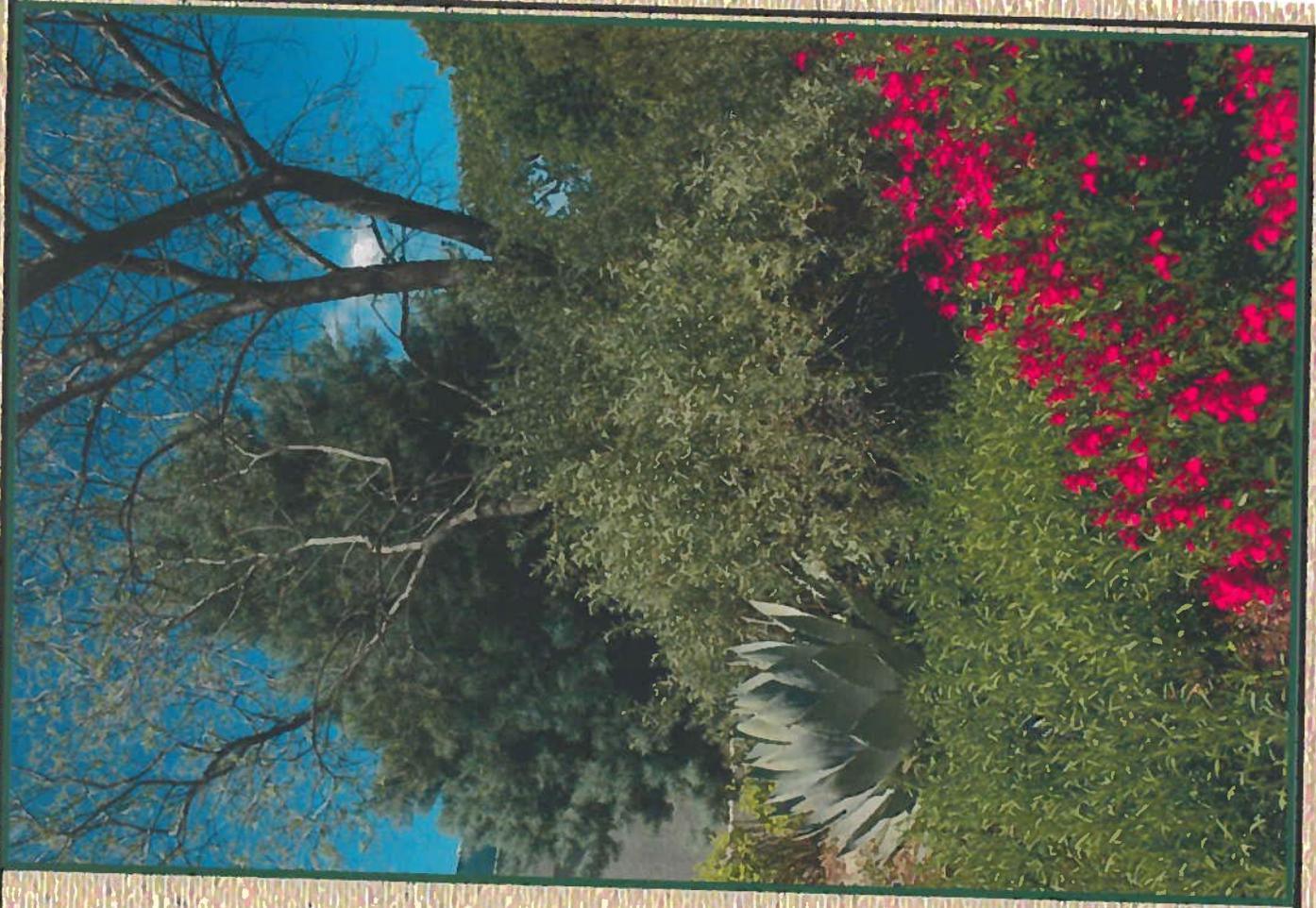
# Examples of XERISCAPE:



# Examples of XERISCAPE:



# Examples of **XERISCAPE:**



# Examples of **XERISCAPE:**



# Examples of **XERISCAPE:**

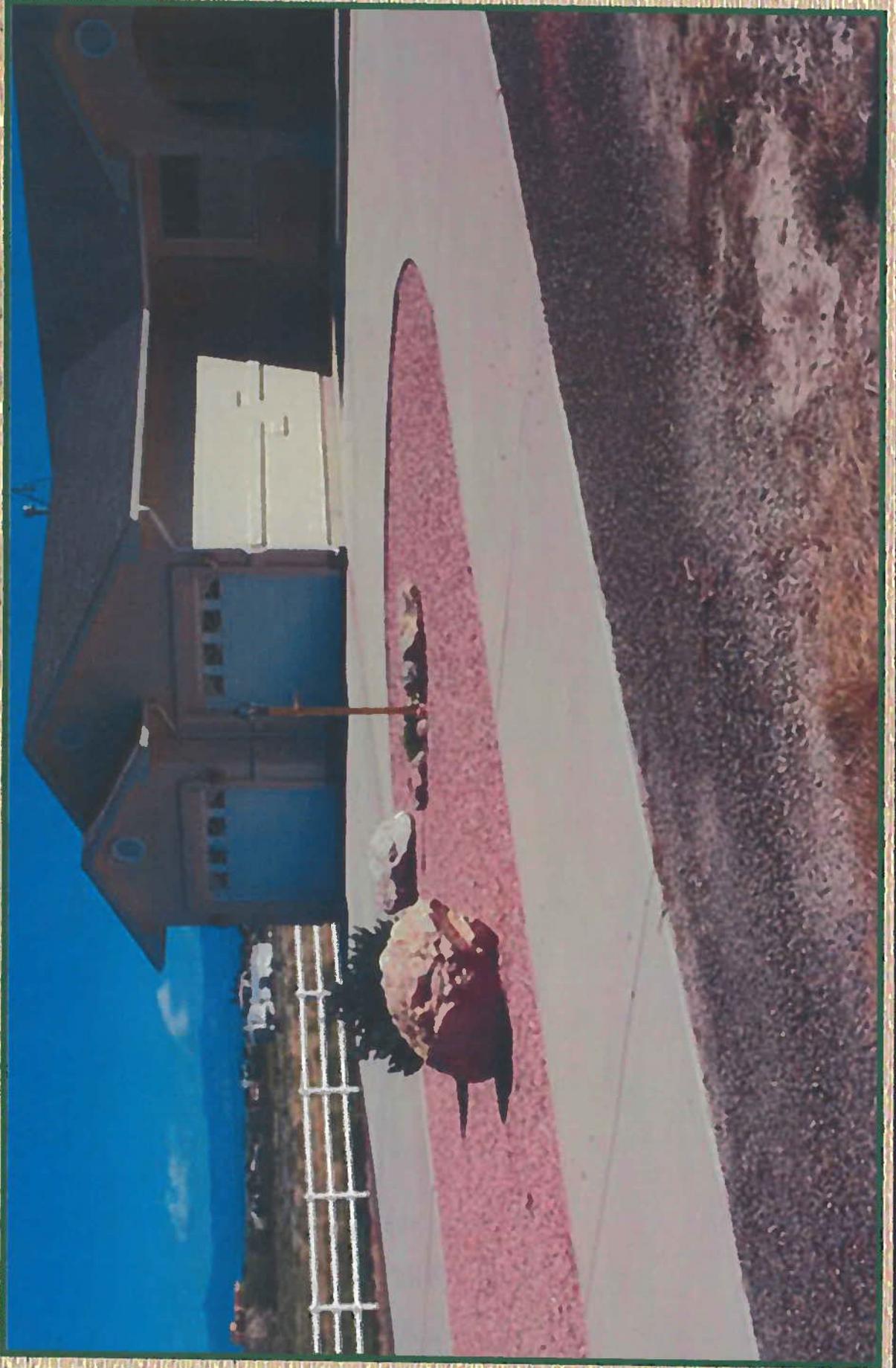


Sometimes **XERISCAPE** has  
been given a bad rap because  
people have **TOTALLY**  
misinterpreted the technique!

Here's a couple of  
examples:



This is NOT XERISCAPE



Nor is THIS



Why should YOU be interested in . . . .

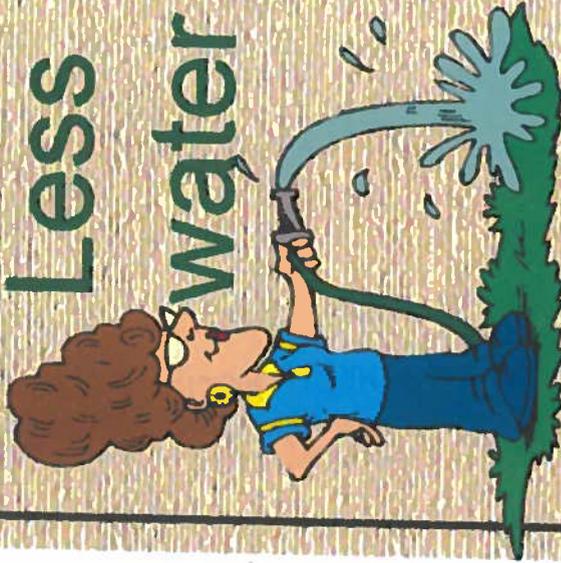


... converting your lawn to  
**XERISCAPE?**



# Reason #1:

Less  
water



pest control



fertilizer



and  
maintenance

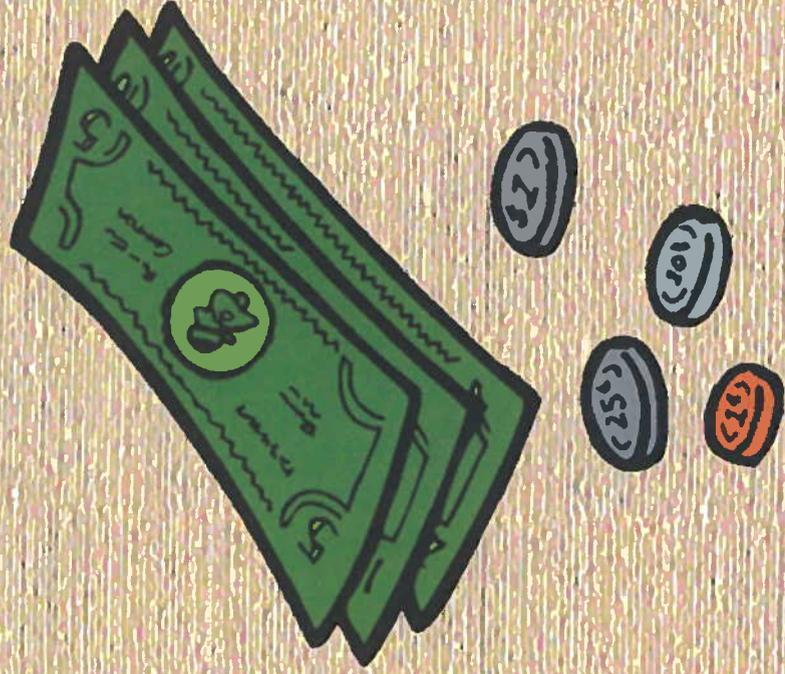
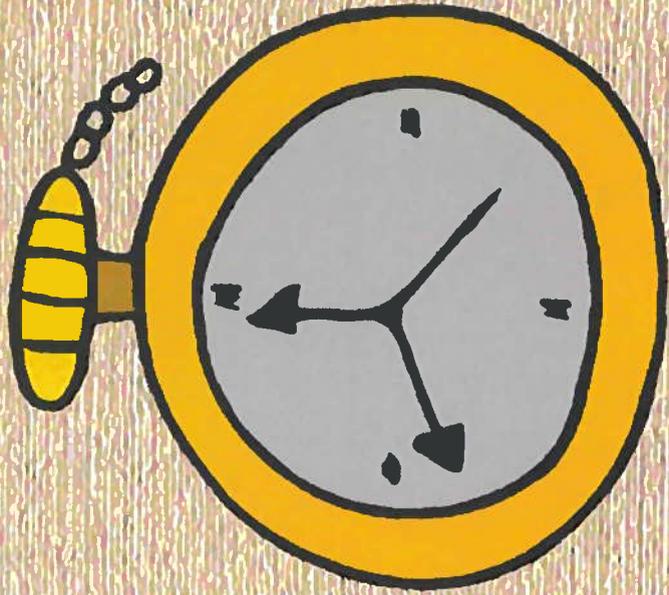


required!



# Reason #2:

Xeriscape saves time and money!



**Reason #3: Xeriscape is typically more creative than “traditional” landscaping.**



**Before: Not a lot of creativity or street appeal.  
(AND 33,000 gallons water use in summer!)**



**After: Lots more creativity and curb appeal!  
(And only 22,000 gallons water use in summer!)**



**Reason #4: Xeriscape is a good move for the future.**

*“We predict 36 states will (have) water shortages by 2013.”*

**- EPA**



## **Reason #5:**

**Xeriscape  
minimizes  
senseless  
water waste  
(run-off from  
watering).**



**Reason #6:** Xeriscape helps avoid lawn chemicals being washed into water sources.



There are 7 basic steps in

**XERISCAPE:**

1. Planning

2. Soil

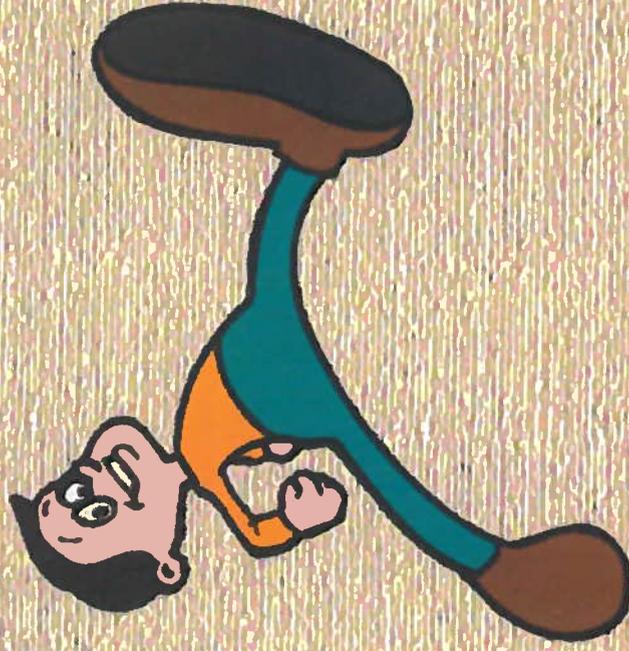
3. Plants

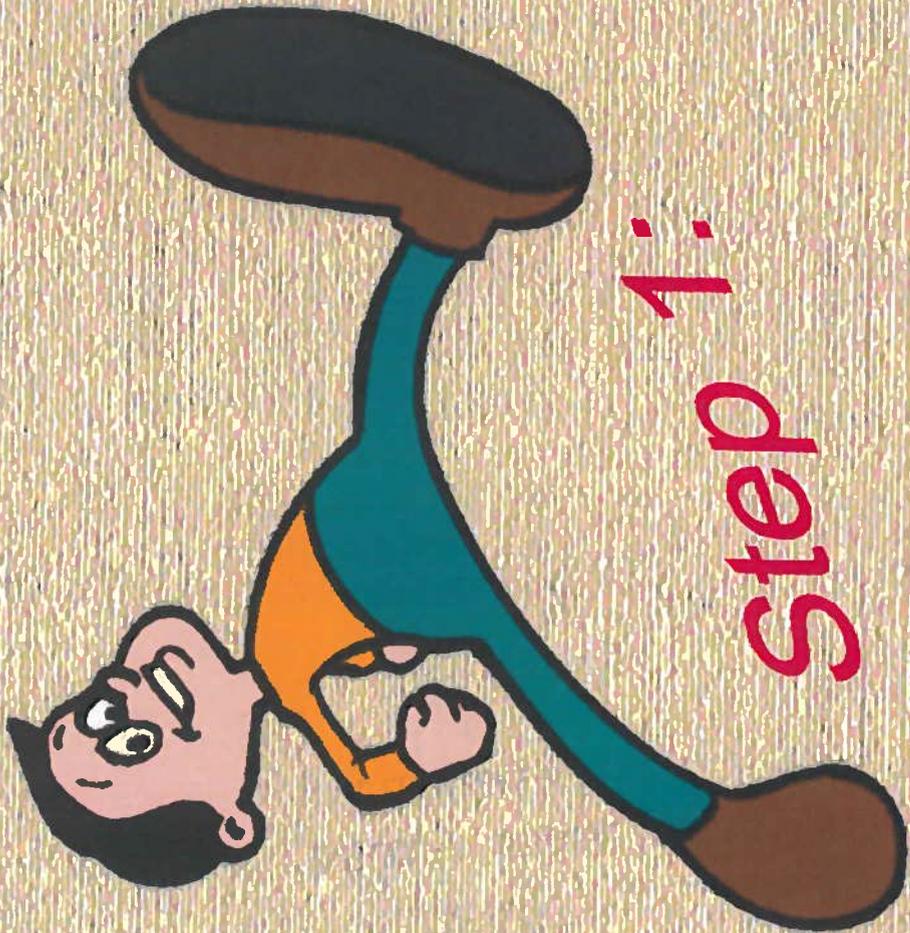
4. Turf

5. Irrigation

6. Mulch

7. Maintenance





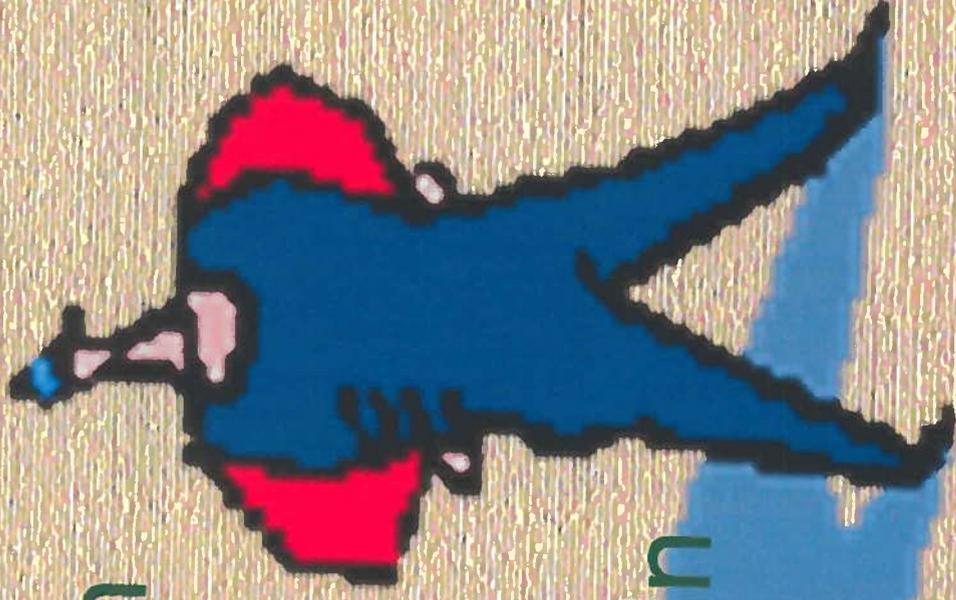
Step 1:

# Planning



It is very important to start your project with a plan.

But that doesn't mean you have to hire a landscape architect (although there are some who specialize in XERISCAPE).



**Make your decision based on your budget, your time frame, and whether or not you enjoy doing landscaping activities yourself.**

**(Of course, if you don't know which end of a shovel is which, you might want to consider hiring help!)**

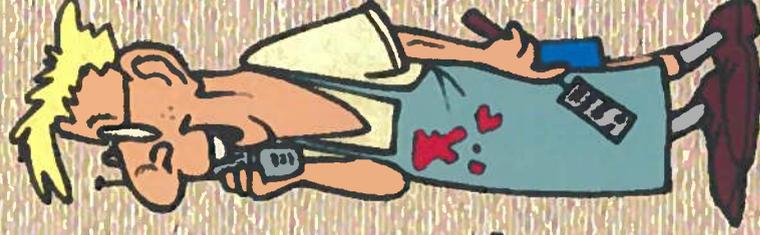


The first thing to consider in coming up with a plan is:

## FUNCTION

What do you want to do in your yard?

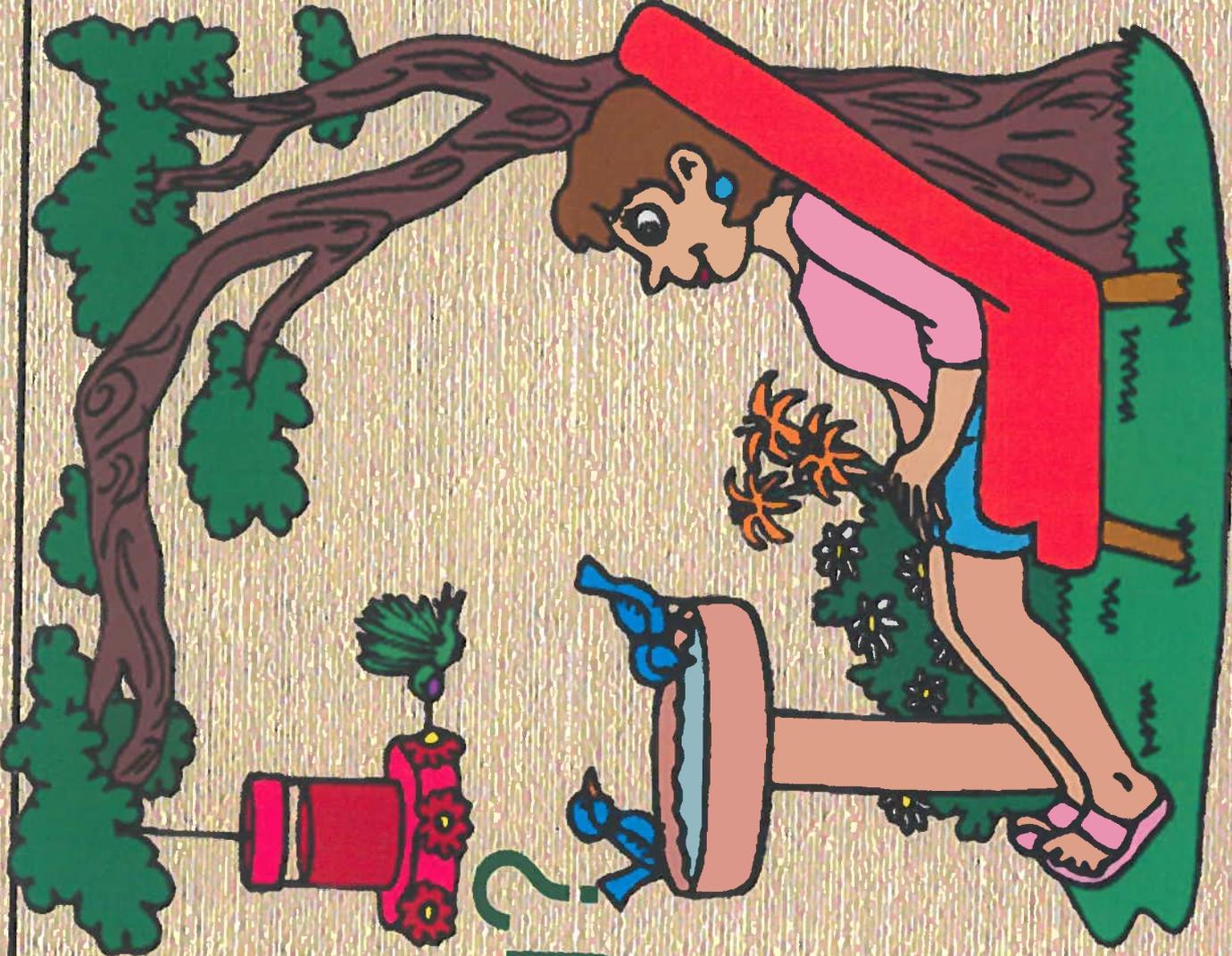
Backyard barbeques?



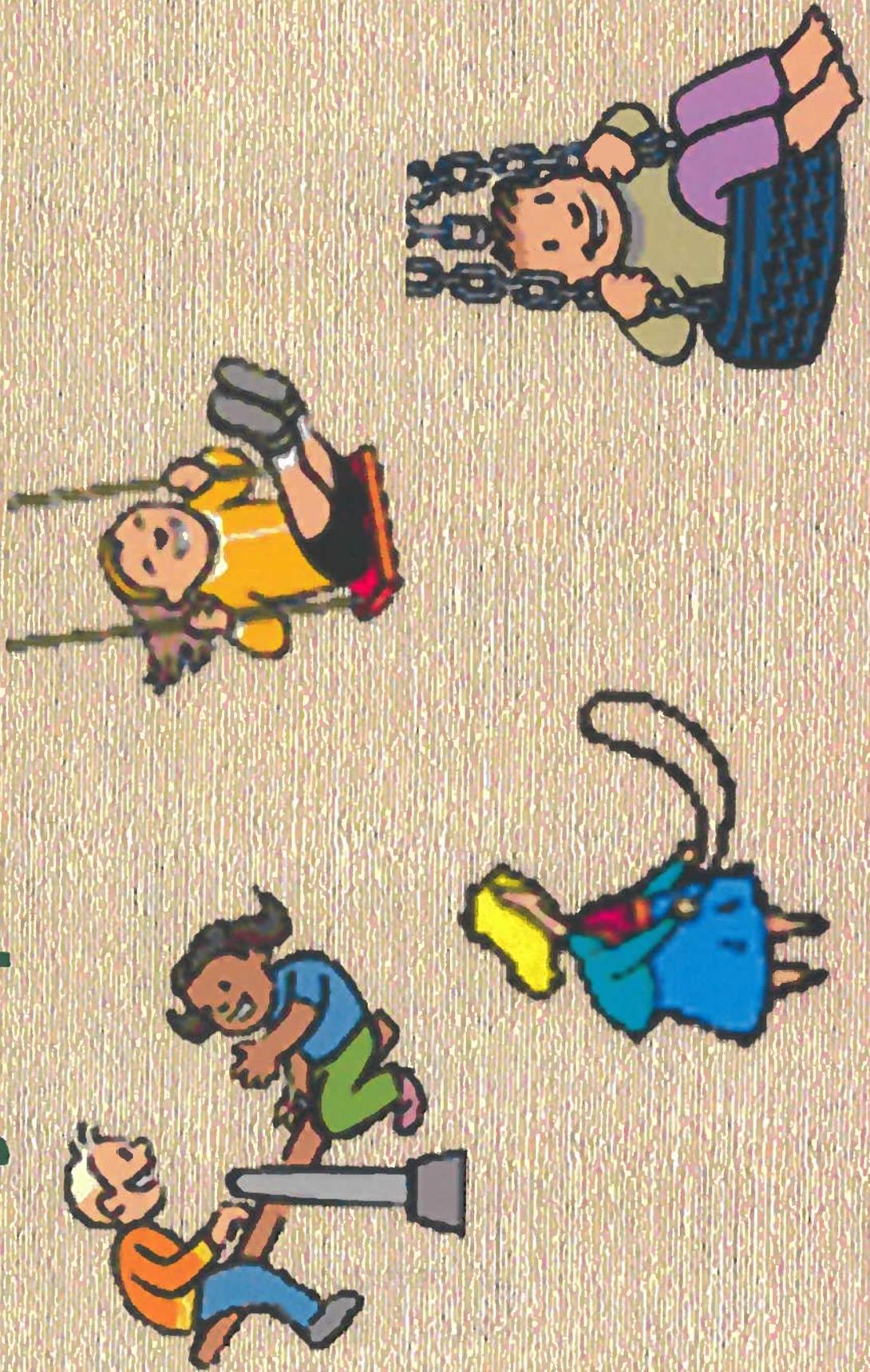
# Gardening?



Relaxing?



# Play space for kids?



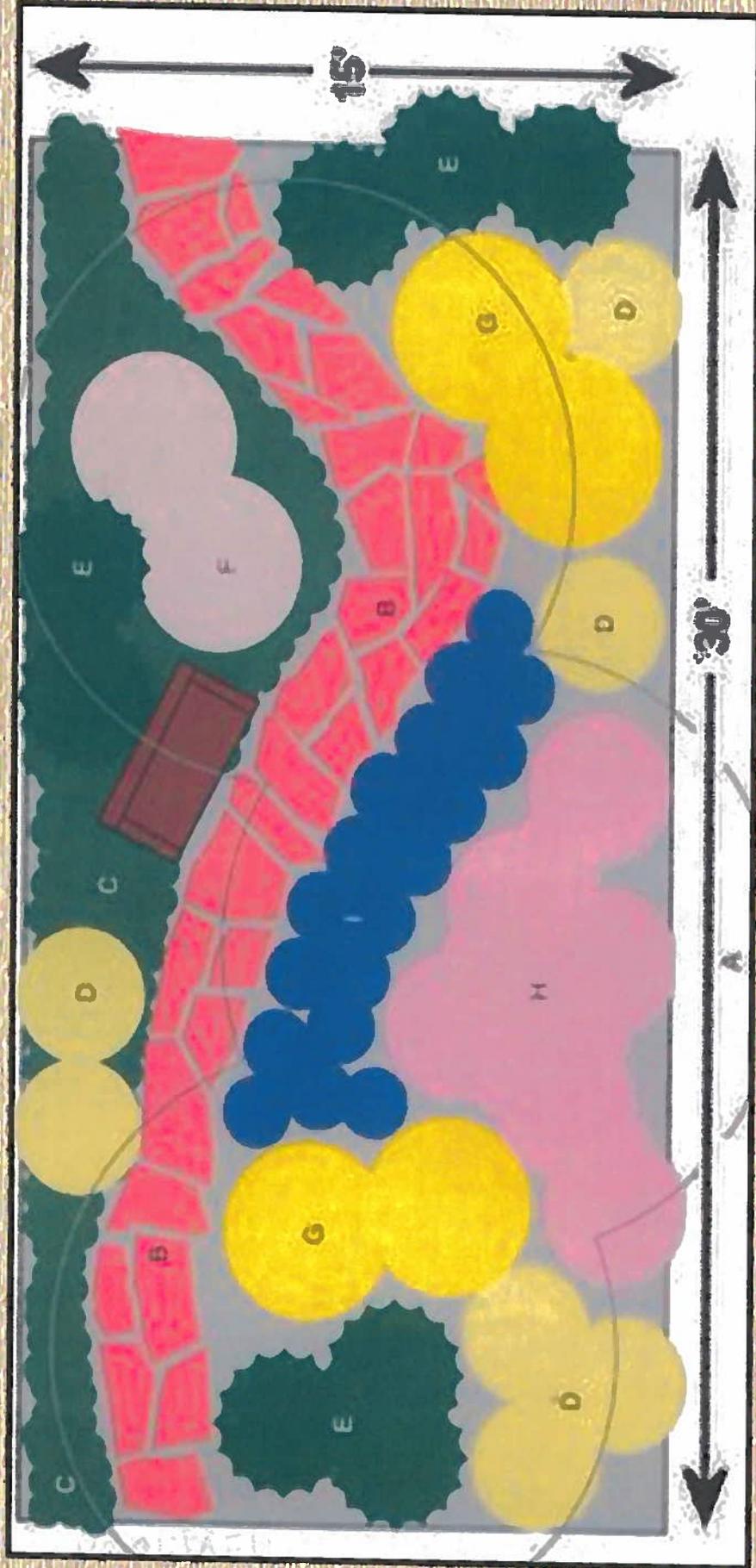
# Morning coffee?



The second phase of the plan is:

## “HYDRAZONES”

Group plantings by water needs.



It may also be important to you to consider:

## **MAINTENANCE**

How much time do you want to spend taking care of your landscape?



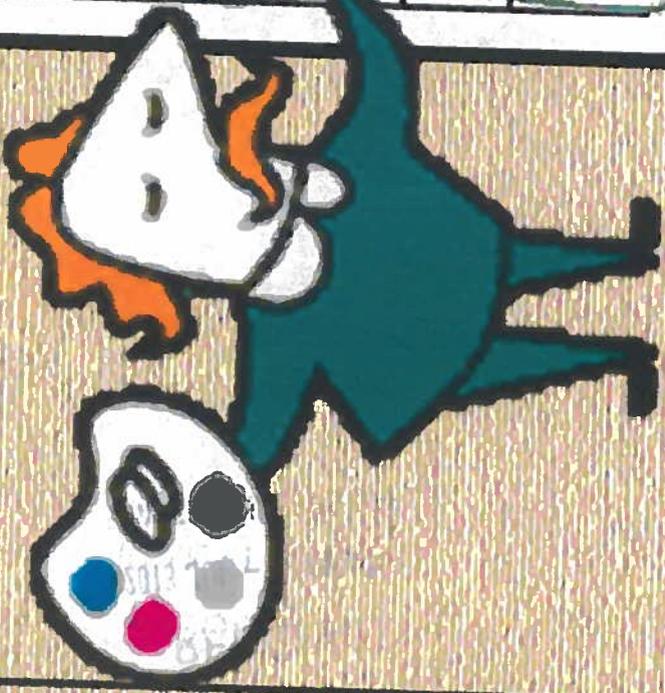
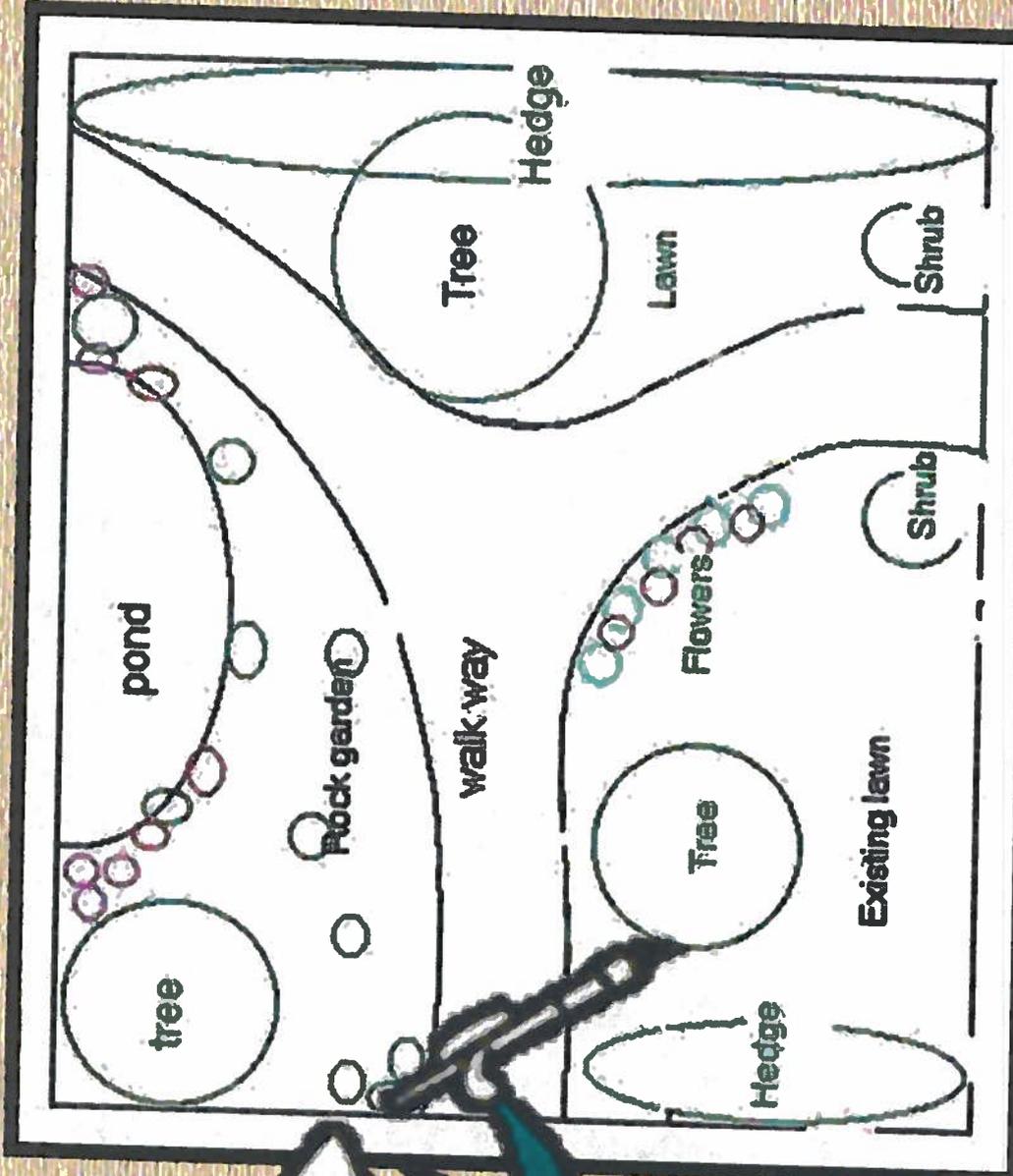
Other considerations in planning a Xeriscape might include:

Pavers, gravel or other types of porous areas where water can infiltrate.



Think color  
and texture  
contrasts to  
create  
interest!

Make simple sketches  
You don't need to be an artist!



Thinking of ways to “section” your landscape by function and watering requirements is a good approach.

For inspiration, you might want to think about your landscape in terms of “Outdoor Living Areas.”

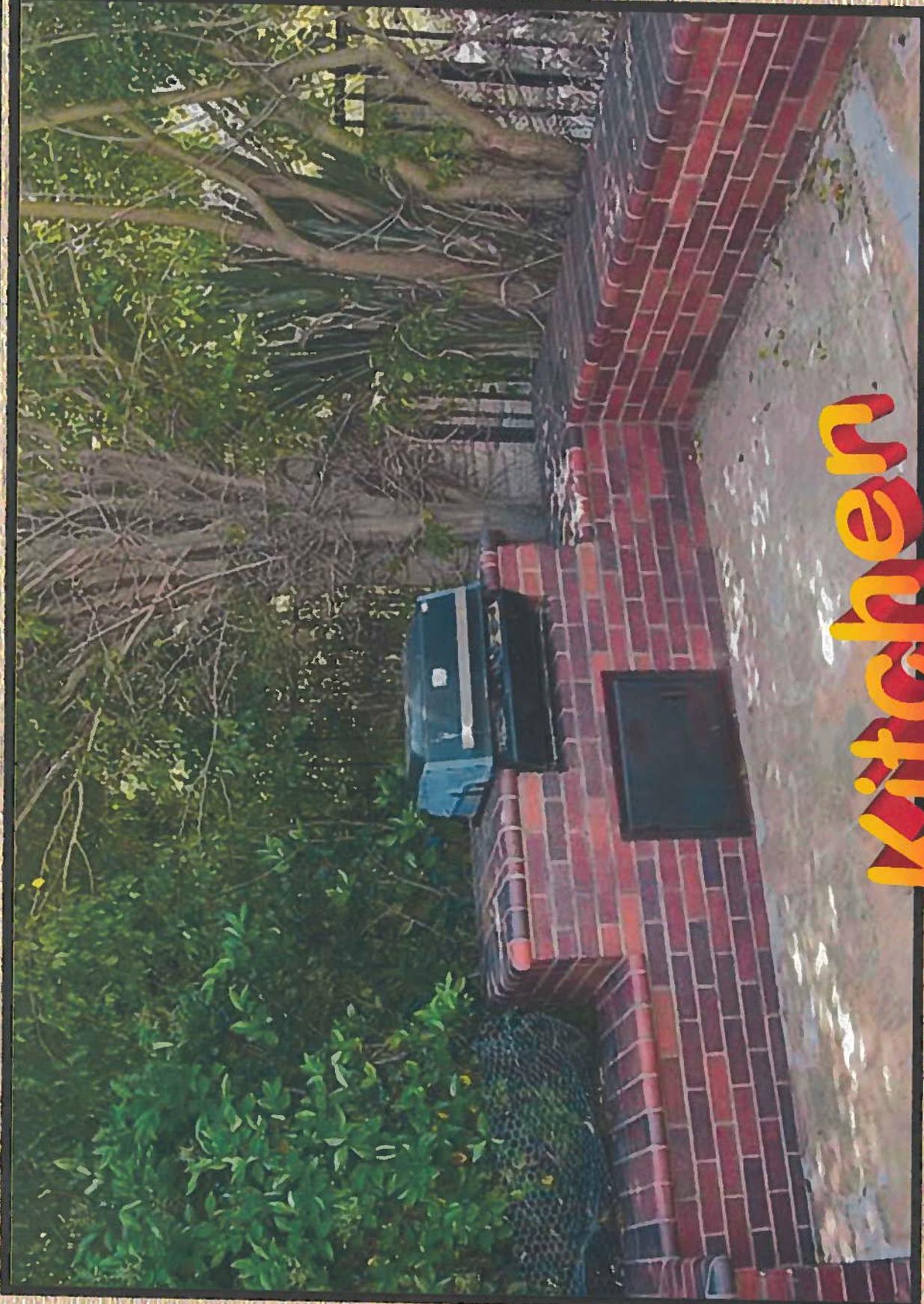
# Living Room



# Dining Room



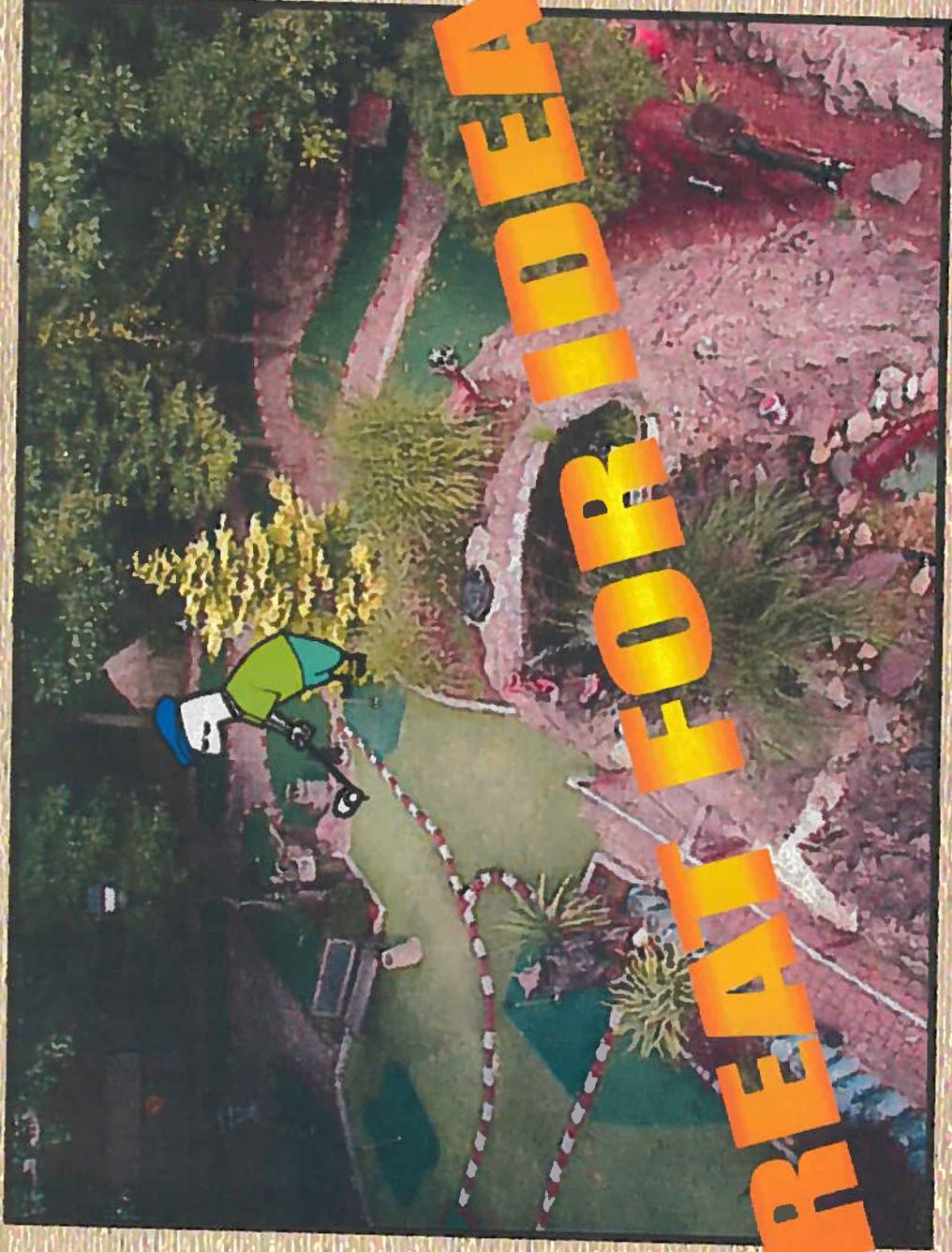
# Kitchen



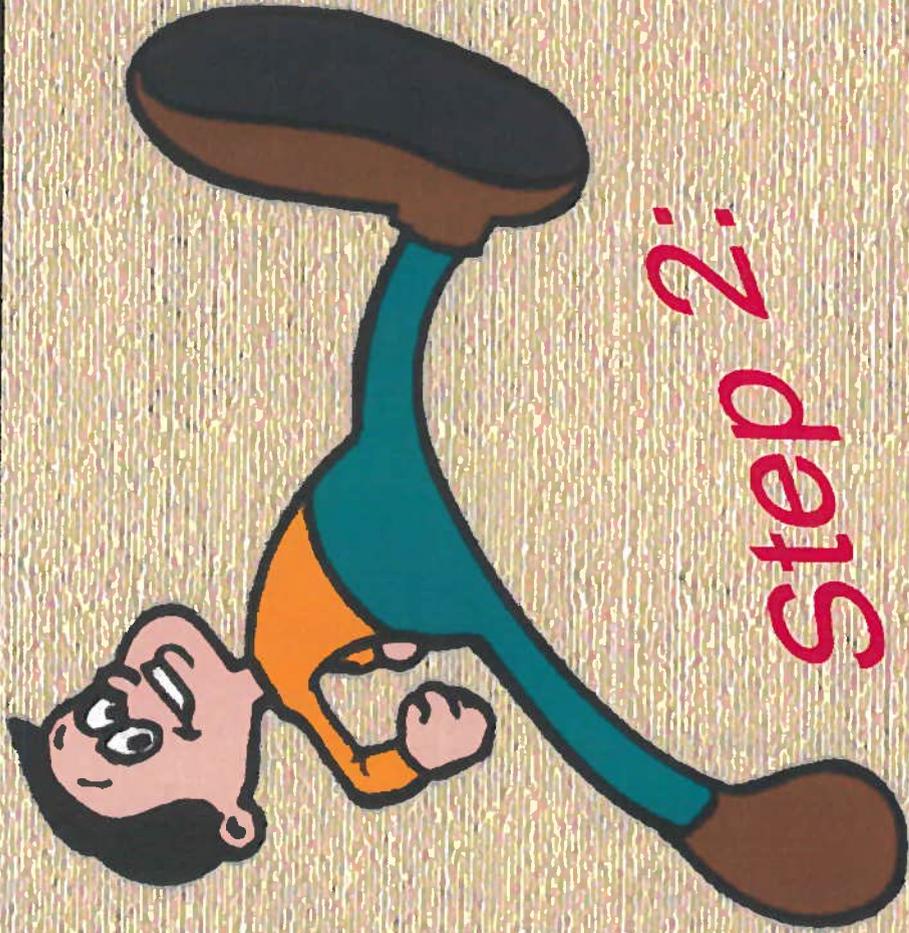


**Bathroom**  
**(Just joking!)**

Miniature golf courses use the  
“sectioning” approach.



**GREAT FOR IDEAS!**



Step 2:

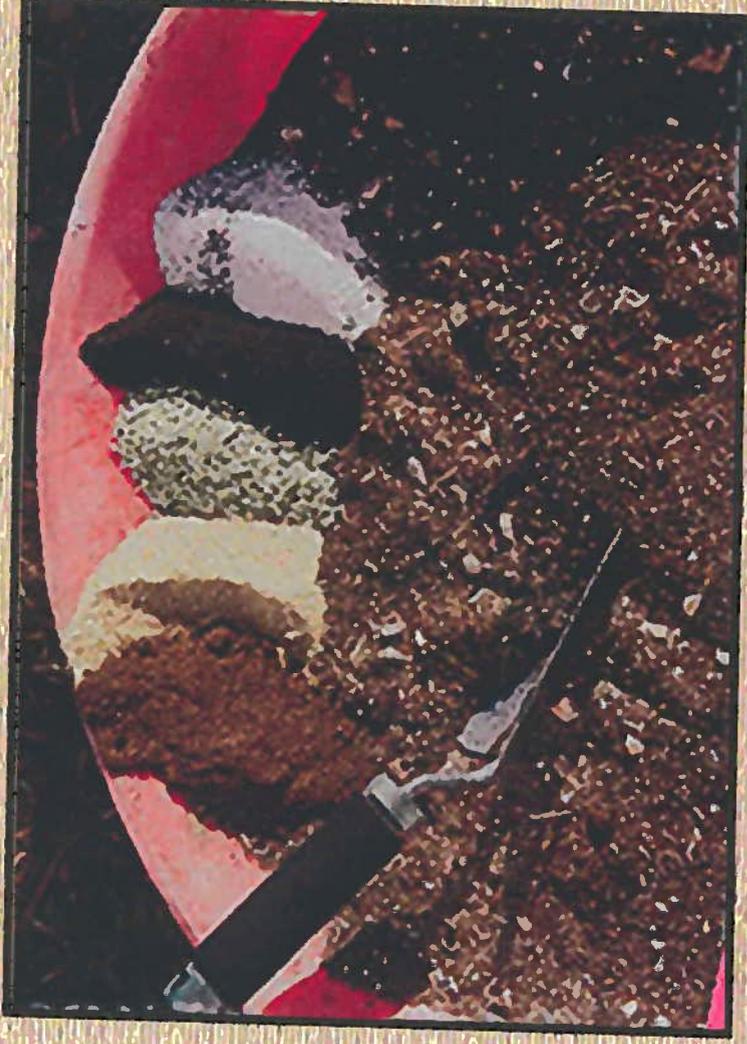
Soil



Soil is the foundation of every  
landscape. The better the soil,  
the more successful a  
Xeriscape will be.

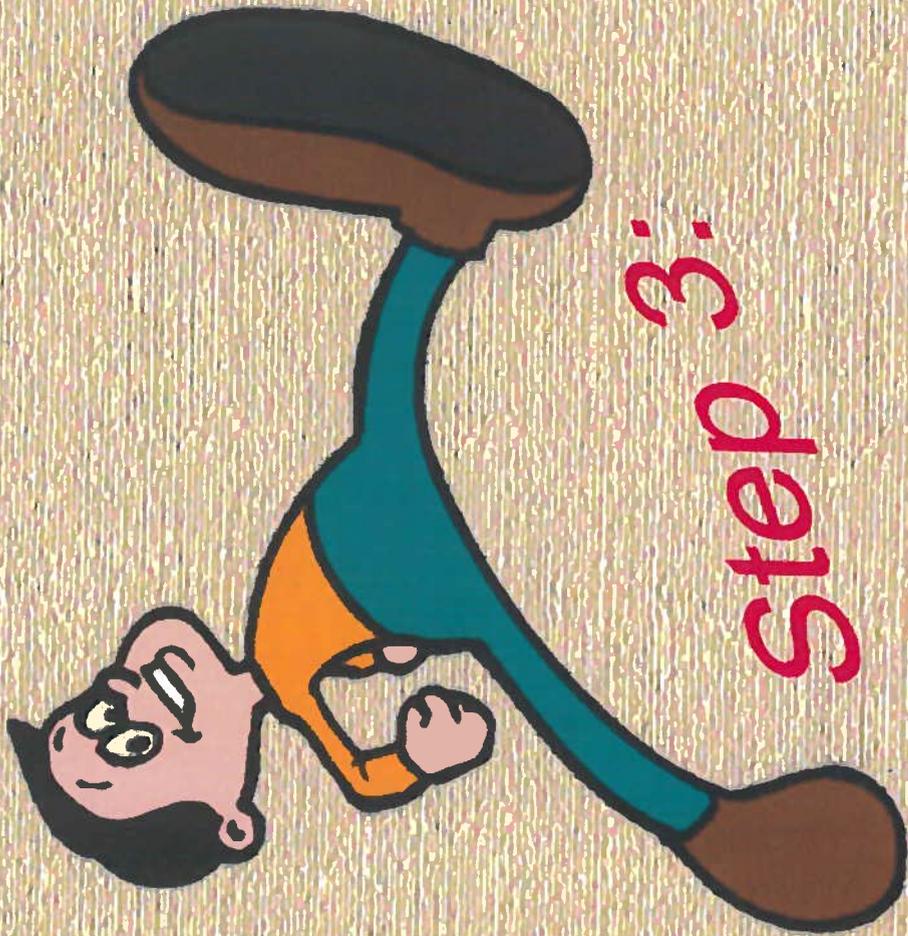


**A soil amendment may be needed to create a soil with the right water infiltration and retention properties for good plant growth.**

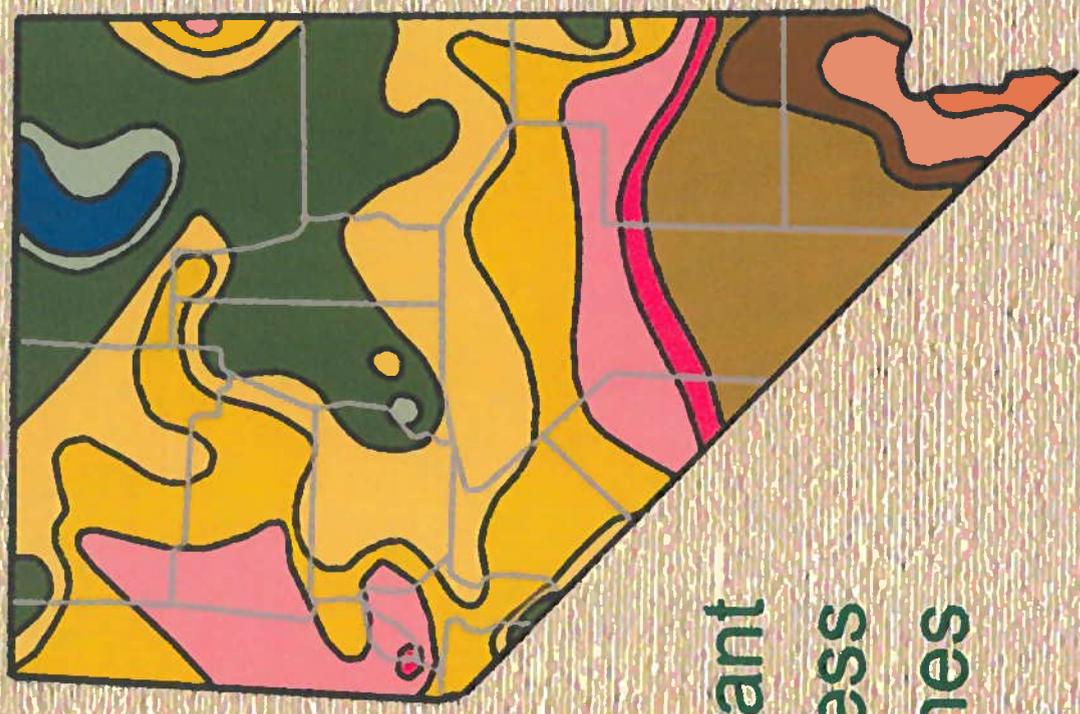


# Plants

Step 3:



Use plants recommended for your area.



USDA Plant Hardiness Zones

Zone	Fahrenheit
4b	-25 to -20 F
5a	-20 to -15 F
5b	-15 to -10 F
6a	-10 to -5 F
6b	-5 to 0 F
7a	0 to 5 F
7b	5 to 10 F
8a	10 to 15 F
8b	15 to 20 F
9a	20 to 25 F
9b	25 to 30 F

Consider using some native plants.



*Native plant  
directory:*

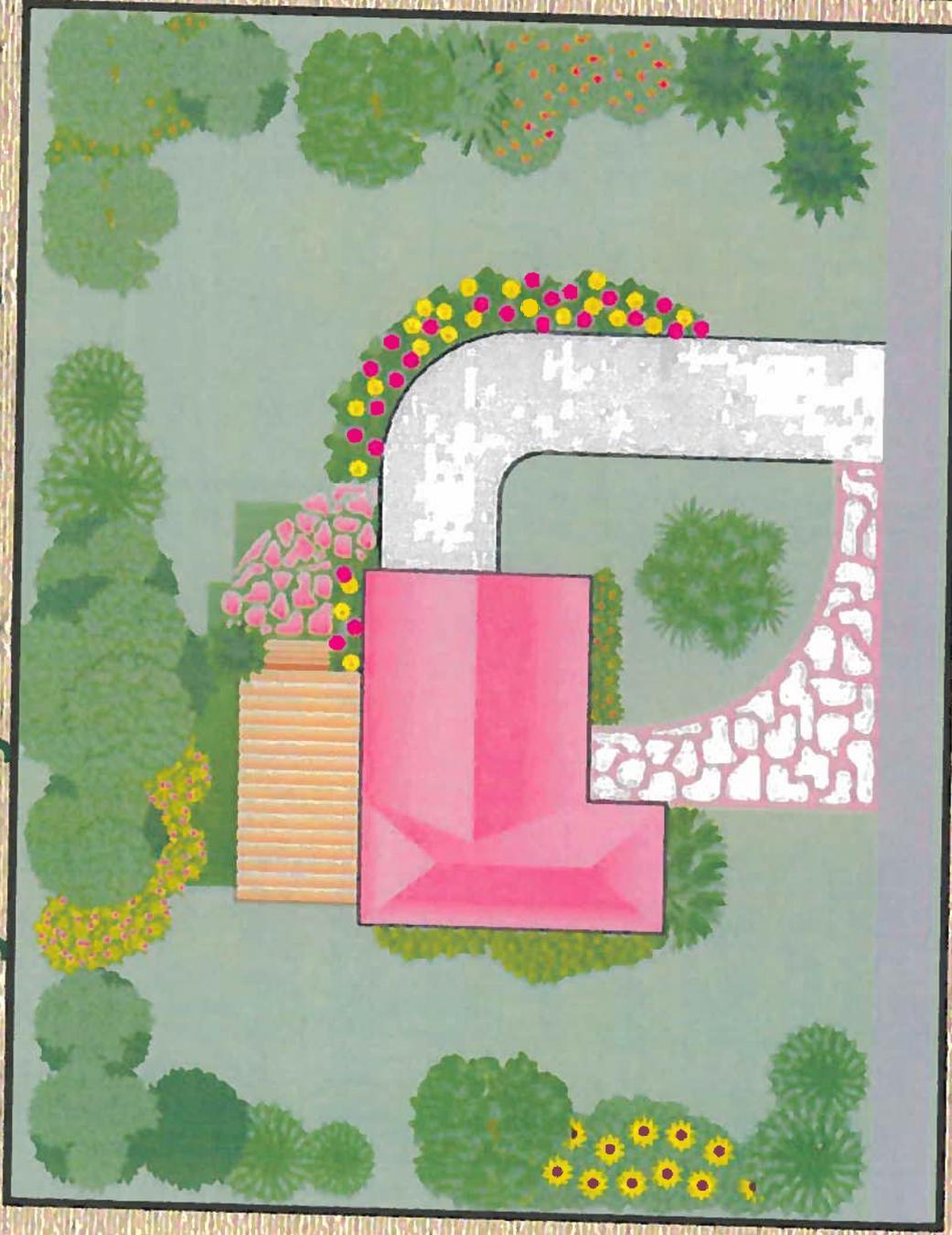
[www.](http://www.wildflower.org/)

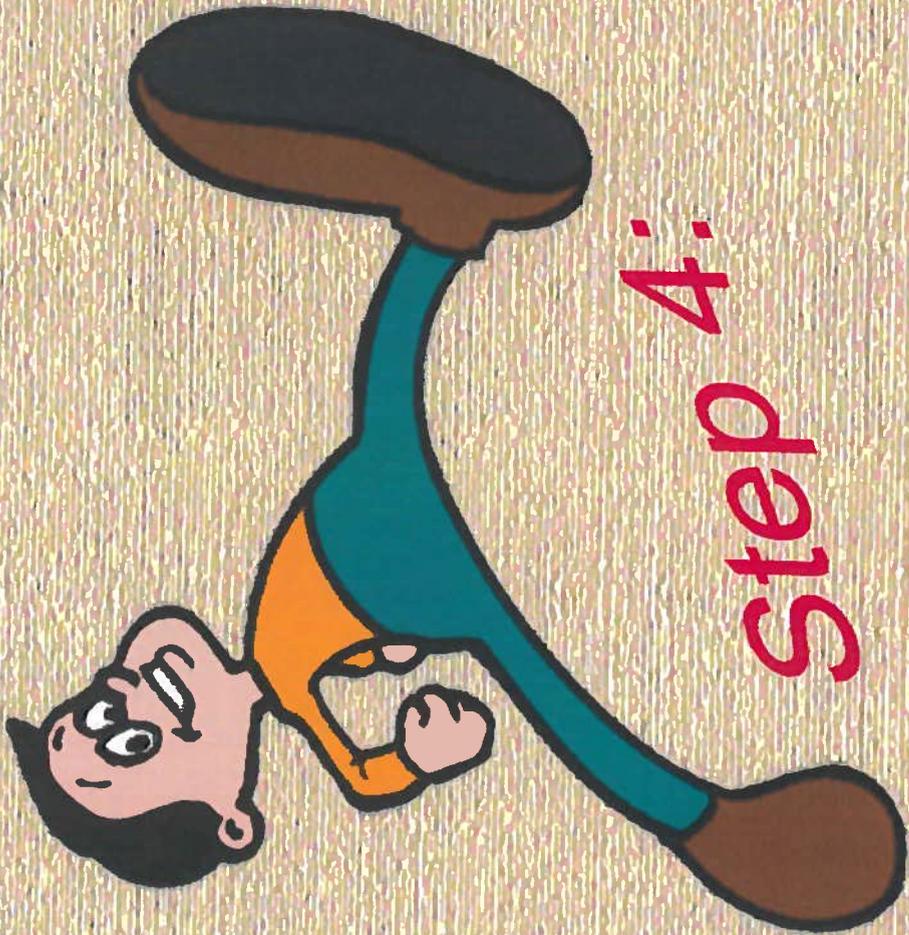
[wildflower.org/?nd=](http://wildflower.org/?nd=)

[native\\_plants\\_database](http://wildflower.org/?nd=native_plants_database)

Remember that it's important to group plants by "Hydrazones"

(similar watering requirements).



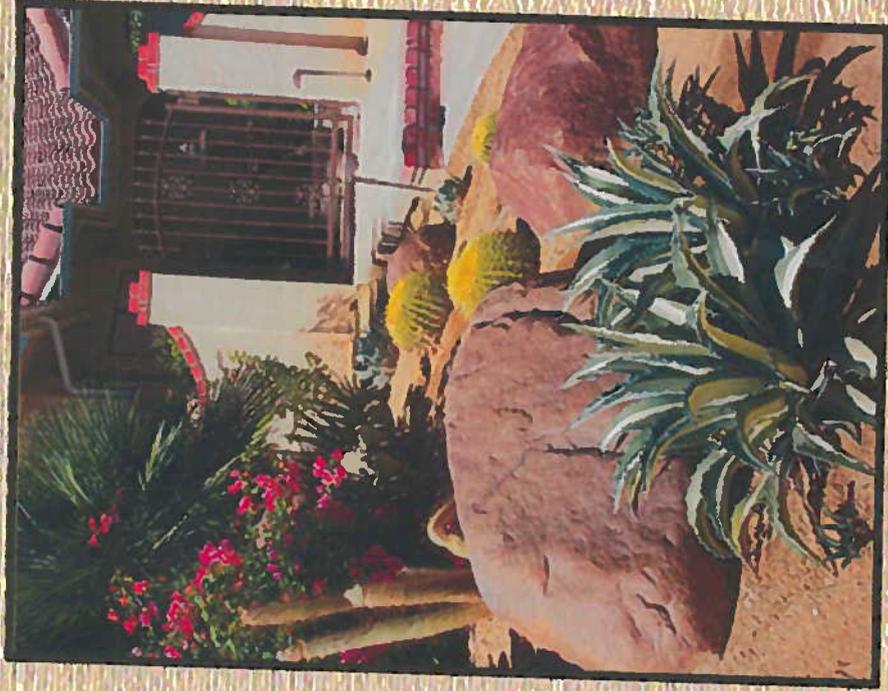


Step 4:

Turf



# Plan turf use wisely.

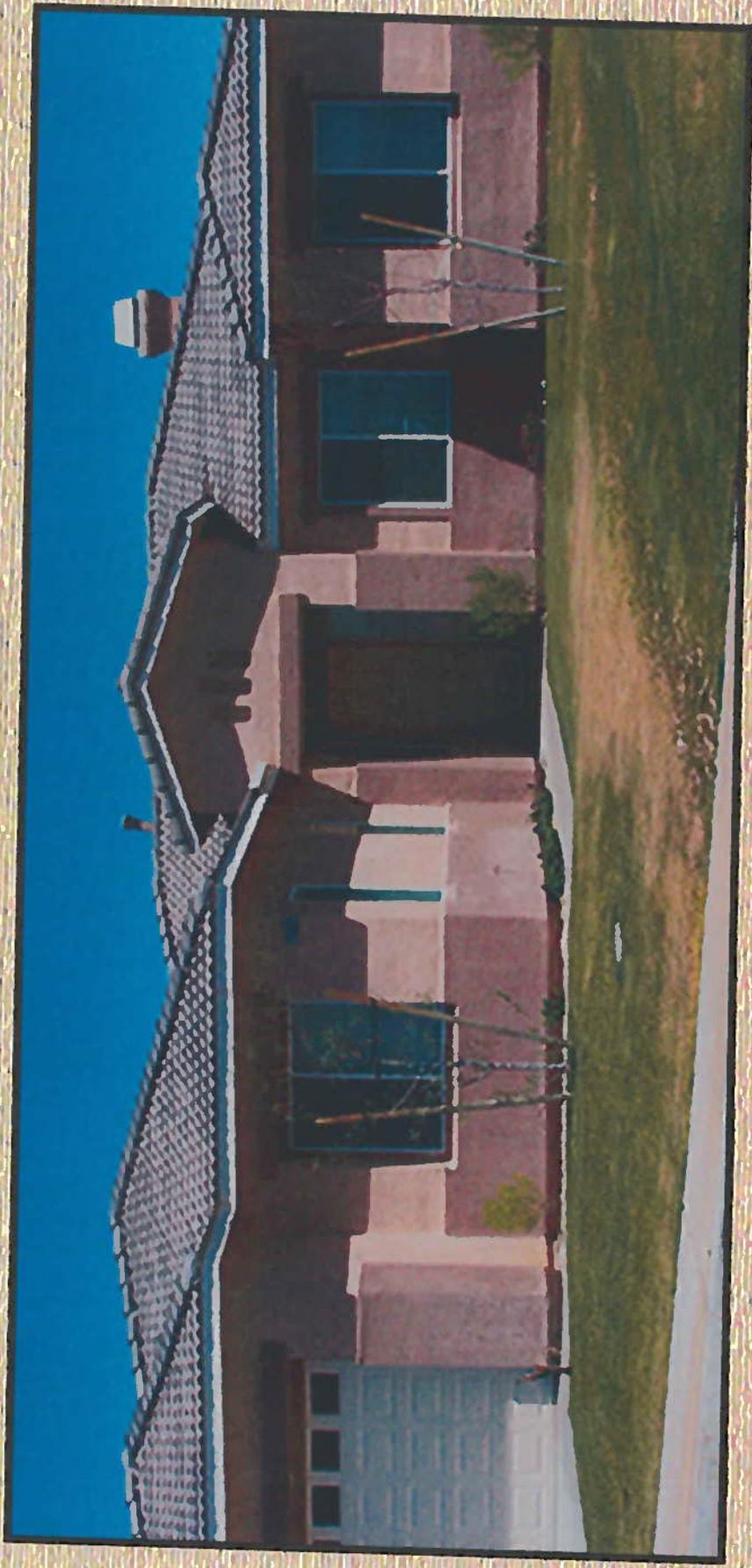


*Could you plan a water-efficient front yard with no turf . . .*



*. . . and a grass play area in the backyard?*

**There are many varieties of turf available. Check with local nurseries for the best type for your area.**



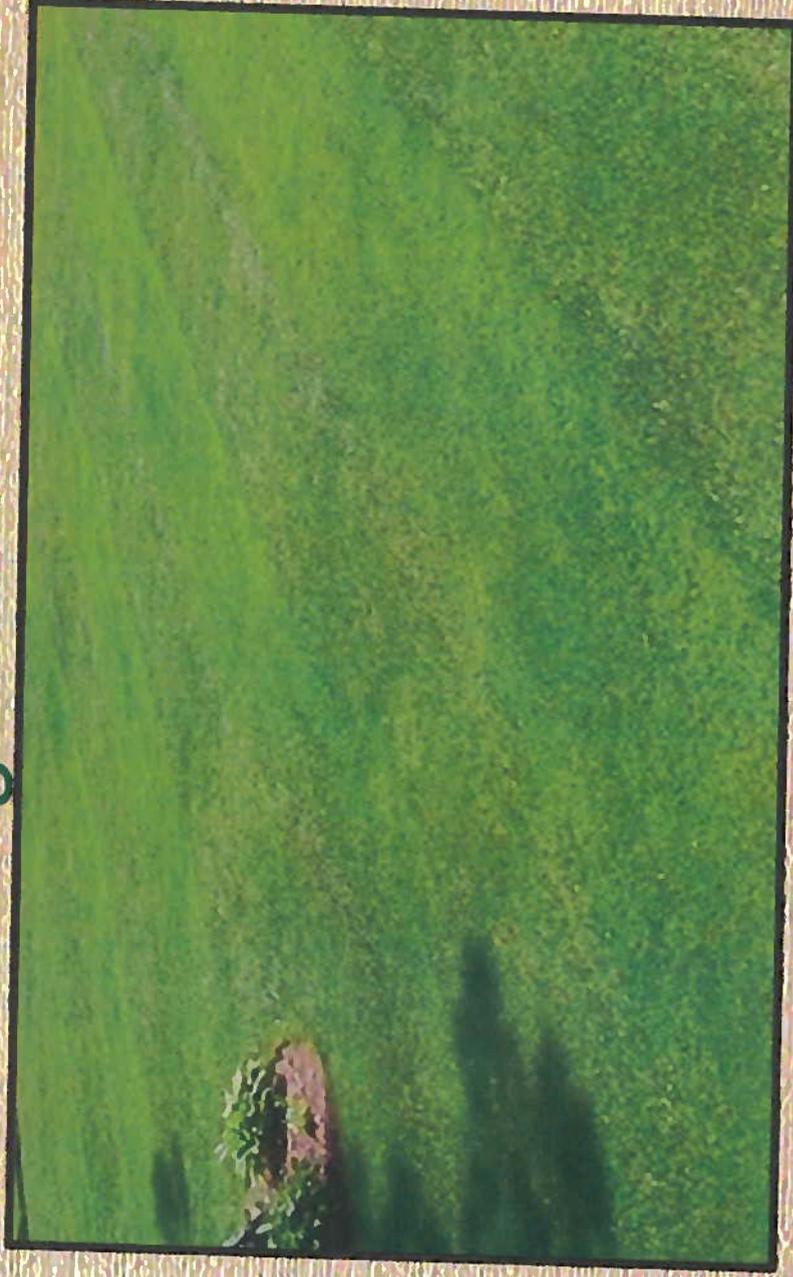
**Try not to plant grass on slopes.  
It's hard to avoid run-off . . .  
and slopes are difficult to mow!**



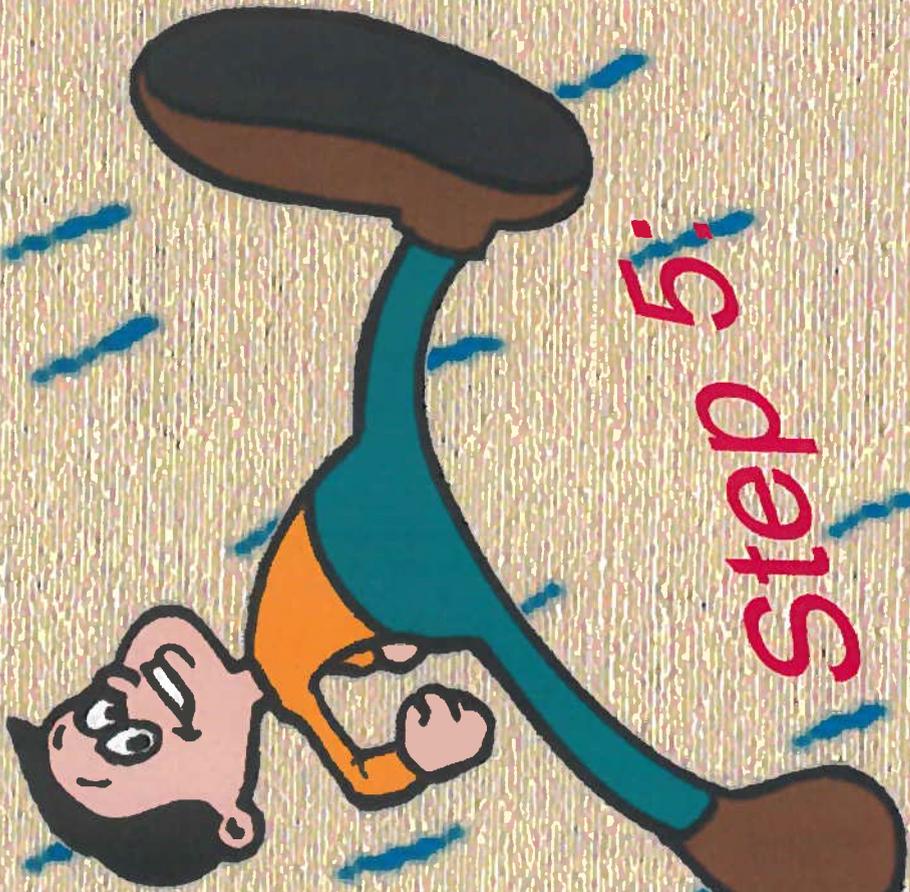
**You might want to consider lawn alternatives such as flowers, ground covers, or even artificial turf!**



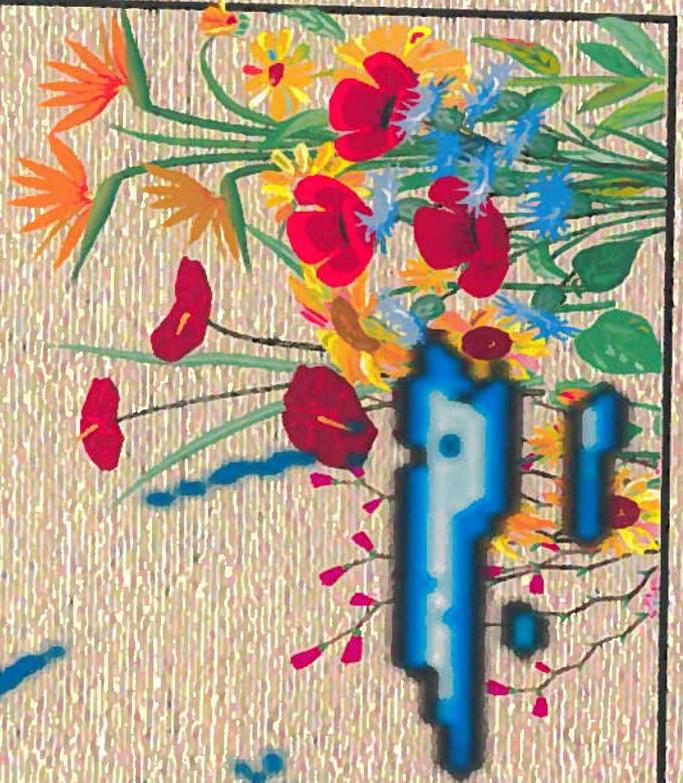
**But remember that there ARE benefits to having SOME turf in your plan. Turf absorbs and holds water, reduces storm runoff, improves water quality and has an overall cooling effect!**



# Irrigation

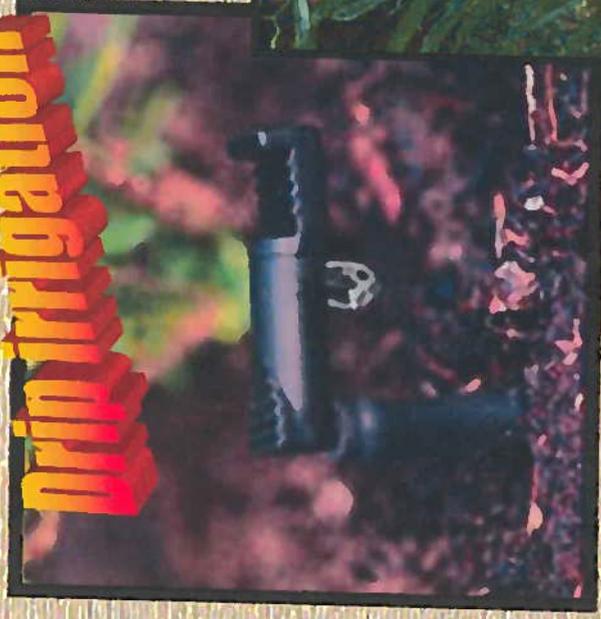


Step 5:

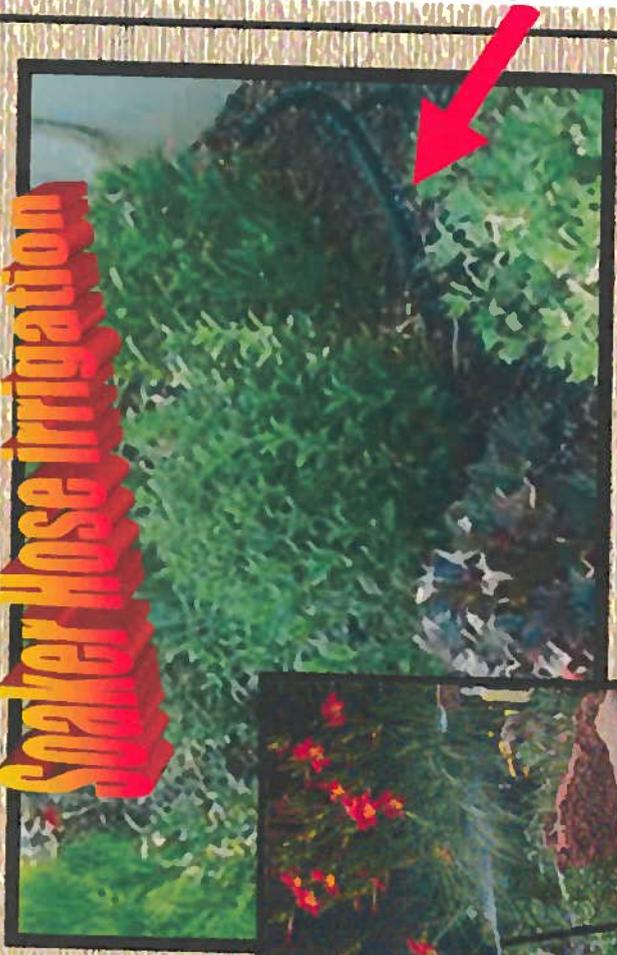


When possible, especially for all non-turf areas, use low-flow types of irrigation:

**Drip Irrigation**



**Soaker Hose Irrigation**

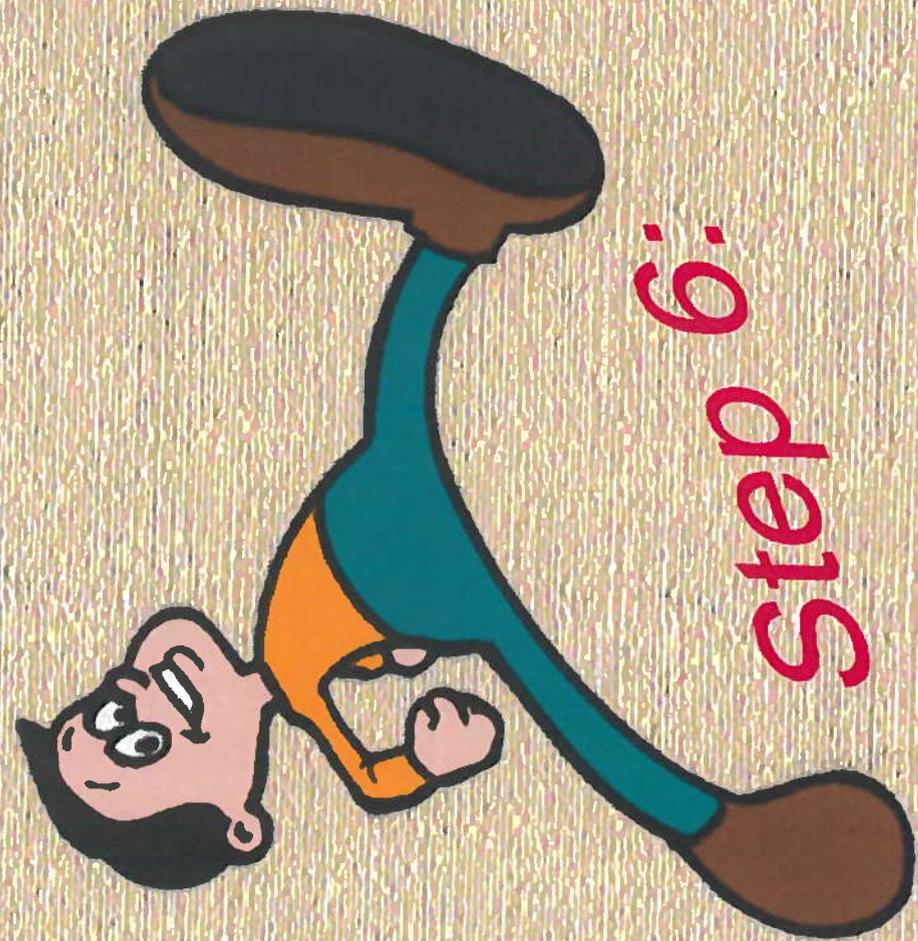


**Low Pressure Sprayer**



**Turf watering requirements can be minimized by matching turf area shapes to the spray patterns of sprinkler heads.**



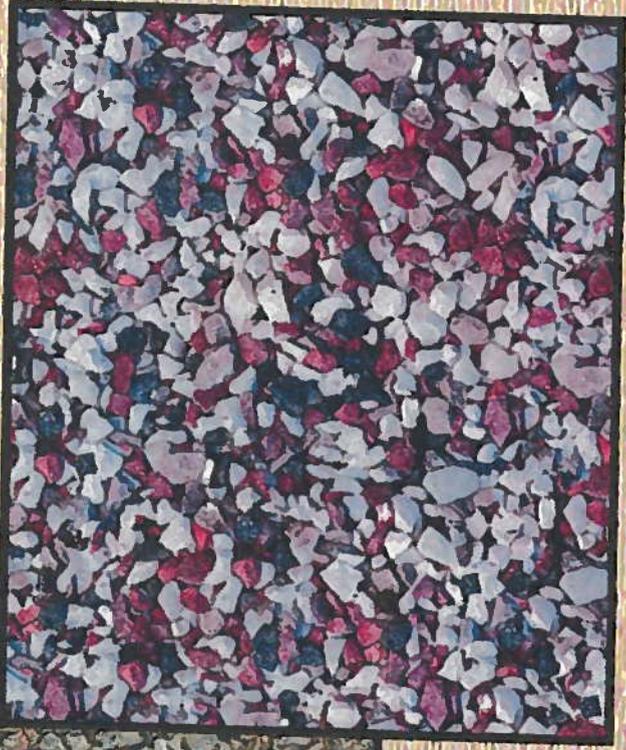
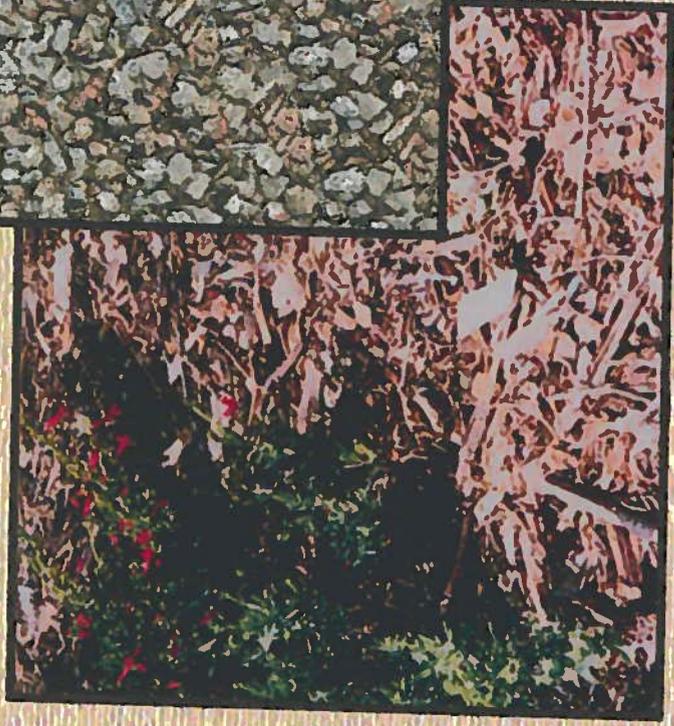


Step 6:

# Mulch



Mulch isn't just bark or wood chips. Gravel, pebbles, rocks, or synthetics such as recycled rubber chips are all forms of mulch.



Mulch minimizes evaporation, cools plant root zones, reduces water loss from evapotranspiration, reduces weed growth, helps control erosion, and adds a finished look to a landscape!





Step 7:

# Maintenance

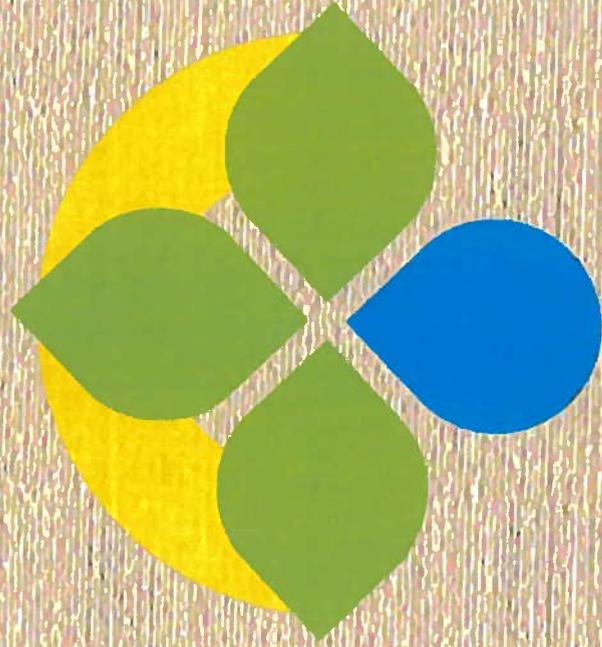
Low maintenance is a big  
benefit to  
Xeriscape .



... but some maintenance is still  
needed to keep your Xeriscape  
looking and functioning  
great!



Think smart . . .



**XERISCAPE™**

