SUSTAINABLE LIVING & RAIN BARRELS

Tired of paying to water your yard? Want to make a difference in the quality of the water in the Bay? Many have heard about sustainable living which may bring up images of commune living. However, "Sustainable Living" is simply a way of life based upon the guiding principle of reducing our individual impact on the environment to ensure a better place for future generations. Local agencies that are part of the Monterey Regional Storm Water Management Program *(MRSWMP)* embrace this concept and have developed this guide as a means of providing details on how you can economically and safely add some rain barrels around your home to not only protect local water quality, but improve it!

WHAT IS A RAIN BARREL?

A rain barrel is any type of container used to catch water flowing from a downspout for future non-potable, exterior uses, such as irrigation. Rain barrels reduce the amount of storm water runoff by collecting roof runoff and storing the rainwater for future use. Rain barrels are one many ways to capture and reuse rain water and one way to achieve "Sustainable Living". They are one approach to implement the concept of "Low Impact Development" *(LID)* at home. LID is an innovative storm water management approach with a basic principle that is modeled after nature: **manage rainfall and storm water runoff at the source and treat storm water as a resource**, not a waste product to funnel away. The goal is to **mimic nature by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.**

Rain barrels, sometimes called cisterns, are aboveground water storage vessels that employ the concept of Rainwater Harvesting. They are used to capture rain runoff from a building's roof using the gutter and downspout system. During a 1 inch storm event for every 100 square feet of roof, roughly 62.3 gallons of runoff water is generated, so 1,000 square feet of roof area will generate roughly 623 gallons of recoverable water for future use. Rain barrels with a drainage valve can store water for use between rain events. When the valve is opened, the water empties out slowly, thus reducing runoff and increasing infiltration.

RAIN BARRELS HELP:

- **Divert water from storm drain systems and thus reduce pollutants and the velocity of water entering local rivers and streams**;
- **Store high quality water for gardens**;
- **Direct overflow water away from building foundations to more desired locations**;
- **Reduce water and sewer bills, as well as electrical bills from sump pump usage**.
- **Rainwater can actually help improve the health of your gardens, lawn and trees. Rainwater is naturally "soft" and devoid of minerals, chlorine and other chemicals found in city water.**

Now that you know the benefits of rainwater harvesting, let's install some rain barrels in your yard.

MATERIALS AND INSTALLATION: Here are some rain barrel material options

A. **Choices:**

- Rain barrels can be purchased from a number of suppliers *(a more expensive option)* or be a make-at-home project *(a cheaper, more labor-intensive option).*
- Pre-fabricated rain barrels cost between $70.00 to $300.00.

B. **Rain barrels:**

Recycled wine barrel = rain barrel

- Vary in size, usually from 20 gallons to 150 gallons. Larger structures can be designed and built, usually out of concrete or wood. Choice of size depends how much water needs to be stored.
- Can be made from wood *(recycled wine or whisky barrels),* heavy plastic *(recycled watertight food grade barrels)* or new concrete. Many commercially made rain barrels are molded heavy duty plastics. The wide array of choices allows for creativity when fitting barrels into garden landscapes and a buildings' architecture.
- The barrel must be structurally sound and should be a food-grade container made to hold liquid. Containers such as trash cans are not designed to withstand the pressure of the water.
- Are easily integrated into rain gardens, vegetable, flower, rock, or other gardens and green spaces.
- Can be linked together to increase water capacity.

C. **Recommended Safety Features**

- The barrel should have a clamped or friction fit cover or a built-in exclusion device. This prevents animals or children from climbing in the barrel and subsequently drowning.
- A screen cover is necessary to prevent mosquito breeding.
- The barrel should be firmly affixed to a sturdy location.
- The barrel must have a lid and a sturdy fine mesh covering all openings to prevent mosquitoes and debris from getting inside.
- It is recommended that the barrel be secured as a precaution.

D. **Placement**

- Locate rain barrels under downspouts where rainwater can be most easily collected for transport away from building foundations into a garden or into the yard.
- Install your rain barrel based on where you will use the water in your yard. Keep in mind that it may be possible to rehang the gutter and move the downspout to a more desirable location. The rain barrel must be located at the base of one of the downspouts draining your roof gutter. This is the downspout you will work with.
- Determine where the water flow from the downspout currently floes, unless it goes to an underground drain pipe system. Sketch a site plan. You can print an aerial view of your property from Google Earth as a starting point. Mark the locations of downspouts and roof lines, estimate the square footage of your roof and paved areas, and map where all these areas drain. This is important since all rain barrels should be equipped with an overflow systems that will funnel storm water overflow away from all structures.
- The base on which the barrel will stand must be level and secure. A typical rain barrel will weigh up to 500 pounds when full. Concrete block or pavers make good substitutes if a patio surface or driveway is not available. Concrete blocks or pavers also raise the barrel off the ground, which increases water pressure coming out of the hose.

- Downspouts should be cut or flexible downspout hose can be attached, allowing a three-inch gap between the top of the barrel and the end of the downspout; this provides space for removing the lid to clean the inside of the barrel.
- Overflow ports and hoses should be placed to drain excess water away from the building to a safe discharge point. If the forecast predicts heavy rain, connect a hose to the overflow port and run it away from the building – no one wants a barrel to overflow right next to the foundation.
- Adding additional rain barrels can increase the quantity of water stored. Overflow from the first barrel can be passed to a second barrel by securely connecting its overflow hose to the next barrel. Remember that the additional barrels must also be securely placed.

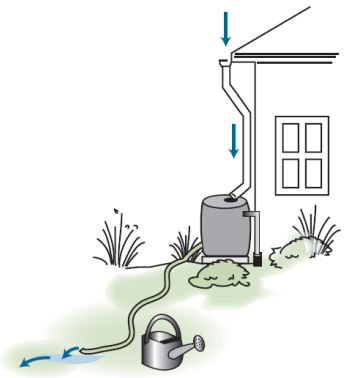
- Rain barrels can collect a relatively small amount of water compared to the runoff from a roof during heavy storms or prolonged rain events. To handle larger volumes of water, rain barrels are best used with additional water management practices such as rain gardens. For information on rain gardens please refer to the MRSWMP "Rain Gardens".
- **Management of heavy rain storms:** Rain barrels fill very quickly in a storm; the overflow must be directed away from building foundations. Connect a hose to the barrel's overflow port and direct the water at least 6 feet away from the building foundation and away from other structures. Check the hose periodically to be sure it is positioned correctly. Another option is to use a diverter, such as the **RainReserve Rain Barrel Diverter** *(http://rainreserve.com/)* that redirects the water to your existing downspout system when the barrel is full. It also is designed to keep leaves and other debris out of the barrel.
- **Larger or more complex systems:** If your goal is to install a larger *(300 gallons plus)* and more complex rain water harvesting system, then a permit may be required so contact your local planning and building departments.
- A rain chain provides added beauty to a rain garden.

E. **Using rain barrels to gravity feed water to a garden**

- Attach a hose to the spigot at the bottom of the barrel. Water is supplied as needed by adjusting the spigot.
- A soaker hose that snakes through a garden will disperse stored water throughout the garden over a prolonged period of time. A 55-gallon rain barrel with a soaker hose takes about 12 hours to drain. A spigot in the middle of the barrel can be used to fill a watering can.
- Success depends on the barrel being sufficiently elevated above garden level.
- Occasionally an air lock can form in the soaker hose; this problem is easily remedied by providing a bleed valve at the terminal end of soaker hose.
- To help conserve dispersed water, cover soaker hose with mulch.

F. **Cleaning & Maintenance:**

- **Cleaning of new barrels:** Clean the inside of new barrels with a brush and a very weak hypochlorite solution *(3/4 cup Clorox per gallon of water)*. Rinse barrel after scrubbing and dispose of rinse water properly.
- **Maintenance:** Rain barrels operate pretty much trouble free. However, periodic checks throughout the season will ensure success – hoses can be inadvertently moved out of place during regular yard maintenance, loosening attachments. Check that lids and hoses are properly placed and attached, that hardware is functioning properly, that no yard pests have found an entrance into the barrels, and that water is being dispersed in expected locations.



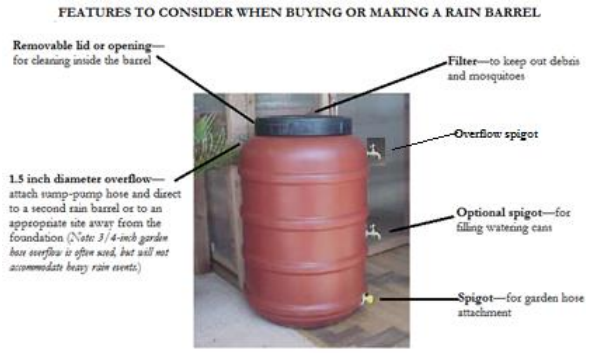
  - Clean gutters at least twice a year, more often if you have trees.
  - Make sure gutters are tilted to direct water to downspouts and fix low spots or sagging areas along the gutter line with spikes or place new hangers as needed.
  - Make sure roof flashing directs water into the gutter.
  - Make sure all parts are securely fastened together and the rain barrel is securely fastened to the building.
  - Clean out the rain barrel and check for leaks at least once a year. Check and clear downspout elbows, rain barrel screening, and overflow to prevent clogging. Caulk any gutter, downspout, barrel, and overflow leaks and holes.
  - Make sure the rain barrel remains securely screened to prevent mosquito entry.
  - If overflow is to a surface infiltration area, monitor the overflow area and re-grade soil if necessary to make sure water drains away from structures and does not flow onto pavement, sidewalks, or neighboring properties.
  - Clean out the rain barrel inlet filter between rain events.
  - Clean your gutters seasonally.

RESTRICTIONS & LIMITATIONS ON RAIN BARREL USE:

- Water collected from rain barrels is not suitable for human or pet consumption,
- Due to lack of research data, water collected in a rain barrel is not recommended for watering fruit or vegetable gardens,
- The water flow *(and pressure)* will be less than from your outdoor spigot, making sprinklers ineffective. Plan to use soaker hoses, handheld spray nozzles and/or watering cans. Elevating your rain barrel on a sturdy platform will increase the flow.

BUILDING A RAIN BARREL:

1. **Tools:** If you elect to build your own rain barrel you will need the following tools:
   - Drill,
   - saber saw,
   - inch hole saw for overflow pipe,
   - one-inch spade bit for spigot,
   - tin snips or heavy-duty scissors for cutting screen,
   - adjustable wrench,
   - utility knife,
   - safety glasses.



2. **To disconnect your downspout to your rain barrel:**
   - Hacksaw,
   - drill,
   - tape measure,
   - screwdriver or nut driver,
   - pliers or crimpers.
3. **Materials**
   - One 55 to 90-gallon food grade plastic barrel *(can be found online or at local restaurant suppliers, nurseries, or gardening supply stores)* or a recycled wine barrel.
4. **Find the following items at most plumbing or hardware stores:**
   - Three hose spigots with 3/4 inch threaded inlet and 3/4 inch male hose end,
   - nine 3/4 inch galvanized locknuts to secure spigot from the inside of the barrel,
   - nine 1-inch *(opening)* washers to provide rigid surface to fasten hose bib,
   - Teflon tape,
   - window screen or 3" drain cone,
   - Teflon cement,
   - water hose *(optional),*
   - bricks or concrete blocks *(optional)*,
   - silicon adhesive or outdoor caulking
   - two 8"x 8" x 12" concrete or wooden blocks,
   - window screen mesh *(enough to cover the barrel opening),*
   - downspout elbow to route the downspout to the barrel,
   - clincher strap *(attaches downspout and barrel to house),*
   - small pieces of wood blocking to use behind clincher strap *(if necessary),*
   - any additional materials necessary for the overflow location,
   - 1/4" #6 sheet metal screws for downspout,
   - 3/4" screws for clincher strap,
   - 2" overflow pipe fittings.

CONSTRUCTION IN 6 EASY STEPS

1. **Inlet:** Create an opening with fine screening through which the rain barrel will collect water from the downspout elbow. This can be a single screened opening large enough to accommodate the downspout elbow *(as shown in the photo),* or a series of smaller screened openings directly in the top of the barrel.

2. **Inlet Filter:** The easiest way is to cut the inlet just large enough to allow you to place a 3" cone drain inlet upside down to catch debris before it flows into the barrel. This should make cleaning out the catch filter easy.

3. **Overflow:** Drill a hole near the top of the barrel to accommodate an overflow pipe that is at least 2 inches in diameter. If the overflow pipe elbow seals and seats securely, it can be threaded directly into the barrel opening. If not, it should be secured with washers on both sides of the barrel and a nut on the inside. Use Teflon tape around the threads and a bead of silicon caulking around the opening to ensure a tight seal.

4. **Foundation:** Create a raised, stable, level base (like concrete blocks) for the rain barrel to sit on. You might want to test stability by filling the rain barrel with water before attaching to your structure. A full rain barrel is very heavy and tipping is a risk if it's unsecured or on an uneven surface.

5. **Downspout:** Cut the downspout with a hacksaw so that the elbow will sit just above the rain barrel inlet. Attach the elbow over the downspout with a screw and secure the downspout to the house with the strap. Attach Barrel: Set up the barrel beneath the elbow and secure the barrel to the house with a strap. Cut and attach the overflow pipe to the overflow elbow and direct to the existing discharge location.

6. **Outlet:** Drill a hole near the bottom of the empty barrel to attach the drain spigot. If the spigot seals and seats securely, it can be threaded directly into the barrel opening. If not, it should be secured with washers on both sides of the barrel and a nut on the inside. Use Teflon tape around the threads and a bead of silicon caulking around the opening to ensure a tight seal.

7. **Use:** After a rainfall, fill a watering can using the bottom spigot or attach a hose to use the water where it's needed.

OTHER WATER CONSERVATION TIPS

- Check your faucets and fix any leaks you might have, to save up to $35 a year on utility bills.
- Wait until you have a full load of laundry before washing, or use a lower water-level setting.
- Annually replace your automatic irrigation timer 9 volt battery
- Adjust irrigation settings based upon the seasons,

- Inspect your irrigation system quarterly for leaks, misaligned heads and / or clogged emitters,
- Avoid overwatering your lawn. When needed, water 1 inch, once a week. To water only 1 inch, place a 6-ounce tuna can on your lawn and stop watering when it is full.
- Invest in water-efficient plumbing fixtures. Replacing an older toilet with a water-efficient model can save up to 4,000 gallons of water a year. Installing a faucet aerator can cut water consumption in half. For additional information on water-efficient products, visit the Environmental Protection Agency's WaterSense website, at <www.epa.gov/WaterSense>.

PAINTED RAIN BARRELS

TIPS

- **Painting rain barrels:** Barrels can be painted to reflect personal taste or to better blend into the landscape or architecture. Paints must be able to withstand climate conditions and be compatible with the barrel material (*for instance, plastic barrels can only take paint specially made to adhere to plastic).*
- If you use a moss-control product on your roof, be sure to use a product that is garden-safe.

INFORMATION & / OR TO REPORT A WATER QUALITY CONCERN

Information herein provided by the Member Entities of the Monterey Regional Storm Water Management Program. For additional information and / or questions please contact any of the following:

Participating MRSWMP Entities

Carmel-by-the-Sea	(831) 620-2010
City of Del Rey Oaks	(831) 394-8511
City of Marina	(831) 884-1212
City of Monterey	(831) 646-3921
County of Monterey	(831) 755-4800
City of Pacific Grove	(831) 648-5722
Pebble Beach Company Area	
Unincorporated	(831) 755-4800
Pebble Beach Co.	(831) 625-8402
Sand City	(831) 394-1386
City of Seaside	(831) 899-6825

Questions or to Report a Water Quality Concern

Emergency spills	911 or (831) 394-6811
Non-Emergency spills	
Monterey Peninsula	(831) 647-7900
Salinas	(831) 755-5111
Hazardous Materials	911 or (831) 755-4511
Sewer permits	(831) 372-2385
Solid waste & recycling	(831) 647-4201
Ca. Fish & Wildlife 1 -	(888) 334-2258

MRSWMP MONTHLY MEETINGS

The MRSWMP Group meets routinely the 4th Wednesday every month, unless otherwise noted at: http://www.montereysea.org at 10:00 at 5 Harris Court, Building D, Monterey CA 93940. To receive monthly meeting notices and/or routine program updates please contact the Stormwater Program Manager at (831) 645-4621 or Doug@mrwpca.com.