



Water Consumption in Southern Nevada

By Paul Conyers

Overview

With its massive hotels, casinos, restaurants, and dramatic architecture it can be easy to forget that Las Vegas resides in the middle of a desert receiving just 4.5 inches of rain per year. Its population has grown immensely to nearly 2 million as of 2012 and that is without including the more than 30 million tourists visiting every year. With this growth more and more water is needed to keep yards and golf courses green, to keep the fountains of Bellagio flowing, to support the habitats of Mandalay Bay and the Flamingo, and to allow Las Vegas to maintain its position as a shining oasis of the desert. 90% of the water comes from the same place it has for decades, Lake Mead. The population growth combined with a 12-year drought has made the need for water conservation more important every year.



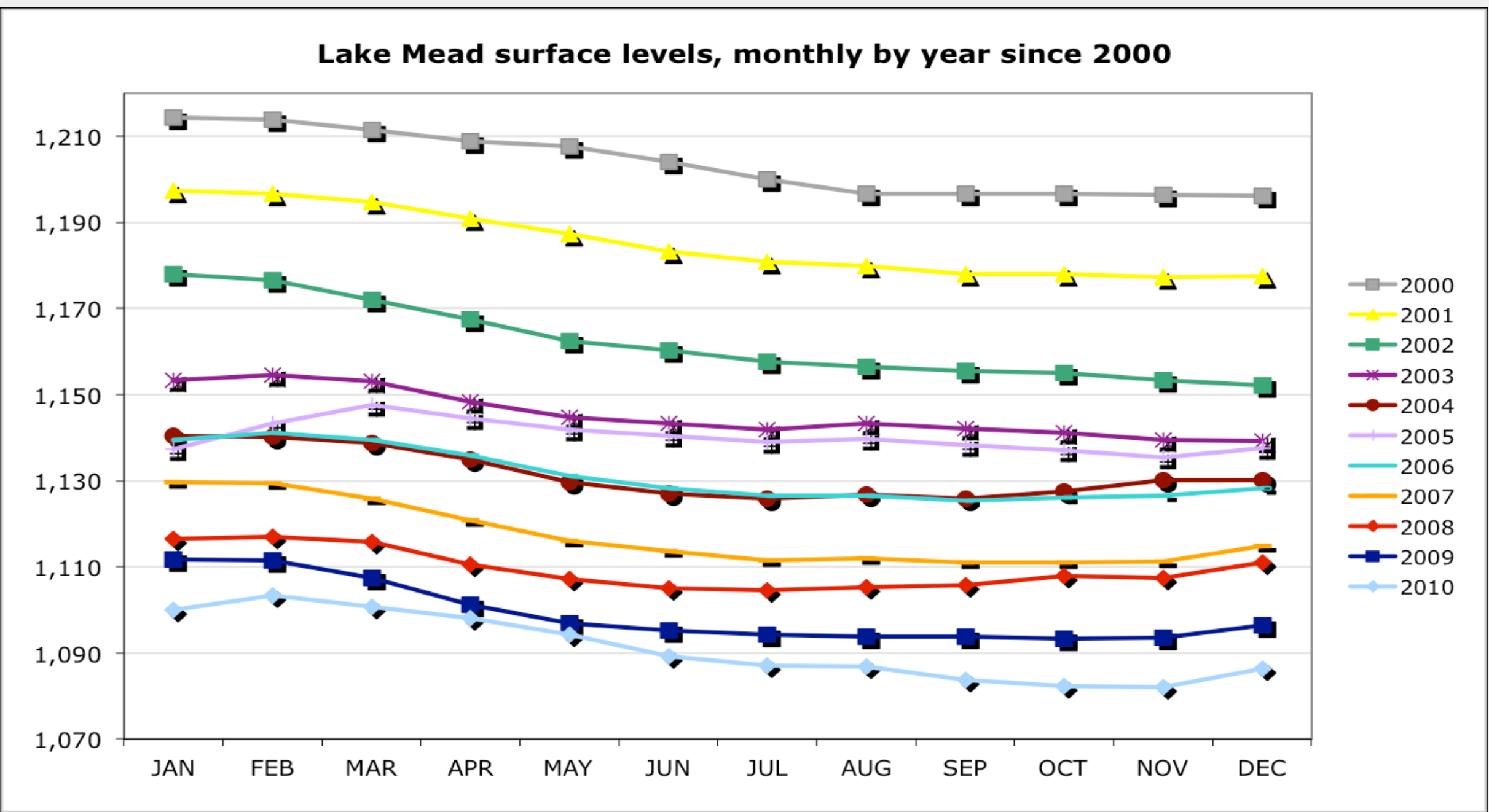
The iconic fountains of the Bellagio need to be replenished by roughly 12 million gallons of fresh water each year ³

Contacts

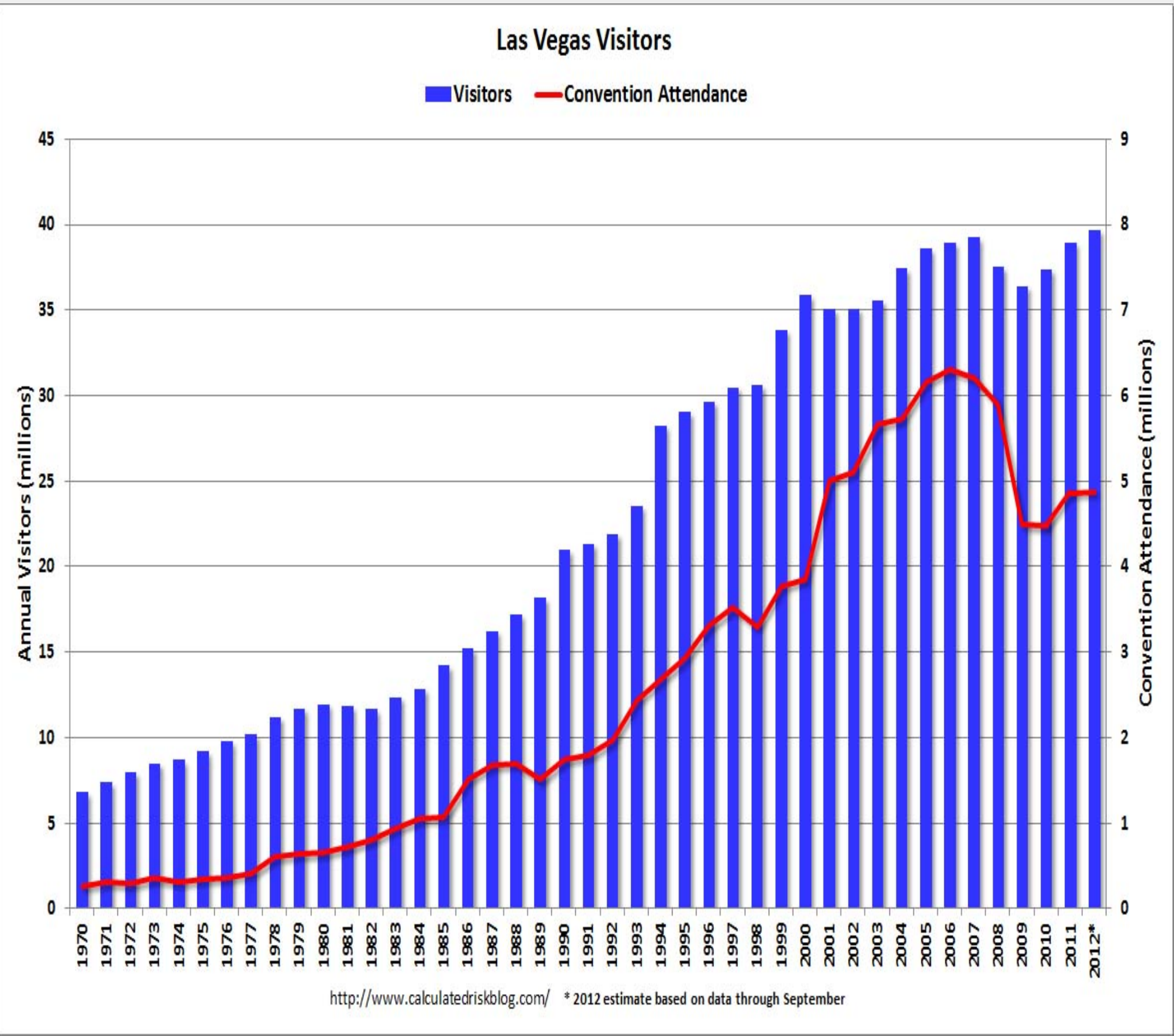
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Questions

1. How has the growth in population and tourism put a strain on the area's water supply?
2. How has the drought exasperated the problem?
3. What steps are being taken to conserve the ever shrinking water supply?
4. Besides Lake Mead, what alternative water sources are being considered?



Lake Mead surface levels through 10 years of drought



Las Vegas has seen a massive spike in tourism over the last 30 years ⁴

Problems

- Situated in the middle of the Mohave Desert, the City of Las Vegas and the surrounding area receive an average of just 4.49 inches per year
- The construction of some 4,700 wells through the 1970s has severely depleted the massive Las Vegas Aquifer, there is nowhere near enough water to supply the valley
- Lake Mead is dependent on snowmelt from the mountains of Utah and Colorado, no amount of conservation can make up for a lack of snowfall
- Lake Mead is currently at just 56.75 % of full-pool capacity
- There are no other nearby sources of water large enough to replace Lake Mead
- Several million people are dependent on a single source of water

Conservation Efforts

- Formation of the Southern Nevada Water Authority in 1991 to oversee water use
- Turf and watering regulations, new grass is prohibited, restricted, and/or strongly discouraged, grass can only be watered on certain specified days
- The use of recycled water to water golf courses, schools, and parks
- Coupons, rebates, and tax-incentives for pool covers, super-efficient irrigation systems, and removal of grass in place of desert fauna
- Installation of drip irrigation systems
- Leak detecting sensors in intake and irrigation pipes
- Controlled water pricing to control demand and penalties for excessive water usage
- Formation of the Water Efficient Technologies (WET) Program in 2001 ²

Drip irrigation—also known as low-flow, micro, and trickle irrigation—is the slow, measured application of water through devices called emitters. Drip irrigation was invented in the early 1960s as an efficient way to water agricultural crops. Now, a wide variety of quality products has been developed to make drip irrigation reliable and easy to use for almost any landscape situation.

Why should I use drip irrigation?
Drip irrigation saves water because little is lost to runoff or evaporation. This watering method also promotes healthy plant growth, controls weed growth, and reduces pest problems.

What types of landscapes are best suited for drip irrigation?
Almost any part of your landscape can be watered with drip irrigation. Drip systems are particularly well suited for desert landscapes, places where runoff can be a problem, and small, narrow areas such as entryways. Drip is also a great way to water gardens, vegetables and potted plants.

There is a wide assortment of equipment to suit most budgets and watering needs.

WHAT ARE THE COMPONENTS OF A DRIP IRRIGATION SYSTEM?

- CONTROLLER/TIMER:** Controls the watering cycle by automatically activating the control valves on the preselected days and times, thereby directing when, how long and how often the system operates.
- BACKFLOW PREVENTOR:** This device prevents the irrigation system water from being siphoned back into drinking water. Your water provider may regulate the installation of backflow preventors. Contact them for more information.
- VALVES:** Manually or automatically operated control valves are used to turn the water on and off. Automatic control valves are wired to a controller.
- FILTER:** All drip systems need some type of filter to keep dirt and debris from clogging the emitters.
- PRESSURE REGULATOR:** Most drip systems operate at low pressure, usually less than 20 PSI. Pressure regulators reduce incoming water pressure to the ideal pressure for the drip system.
- PIPE:** Polyethylene tubing and rigid PVC are the two most commonly used types of pipe.
- MICRO-TUBING:** Also known as "1/4 inch" or "spaghetti" tubing delivers water from the emitters to the plants, or from the poly tubing to the emitter.
- EMITTERS:** These connect to the tubing or can be inside the tubing and deliver water at a slow, consistent rate, usually, 0.5, 1, 2 or 4 gallons per hour.
- FLUSH VALVE/ CAP:** A flush cap is attached to the end of each irrigation line so that dirt and debris can be flushed out of the irrigation system.

Can I design my own drip irrigation system? YES!

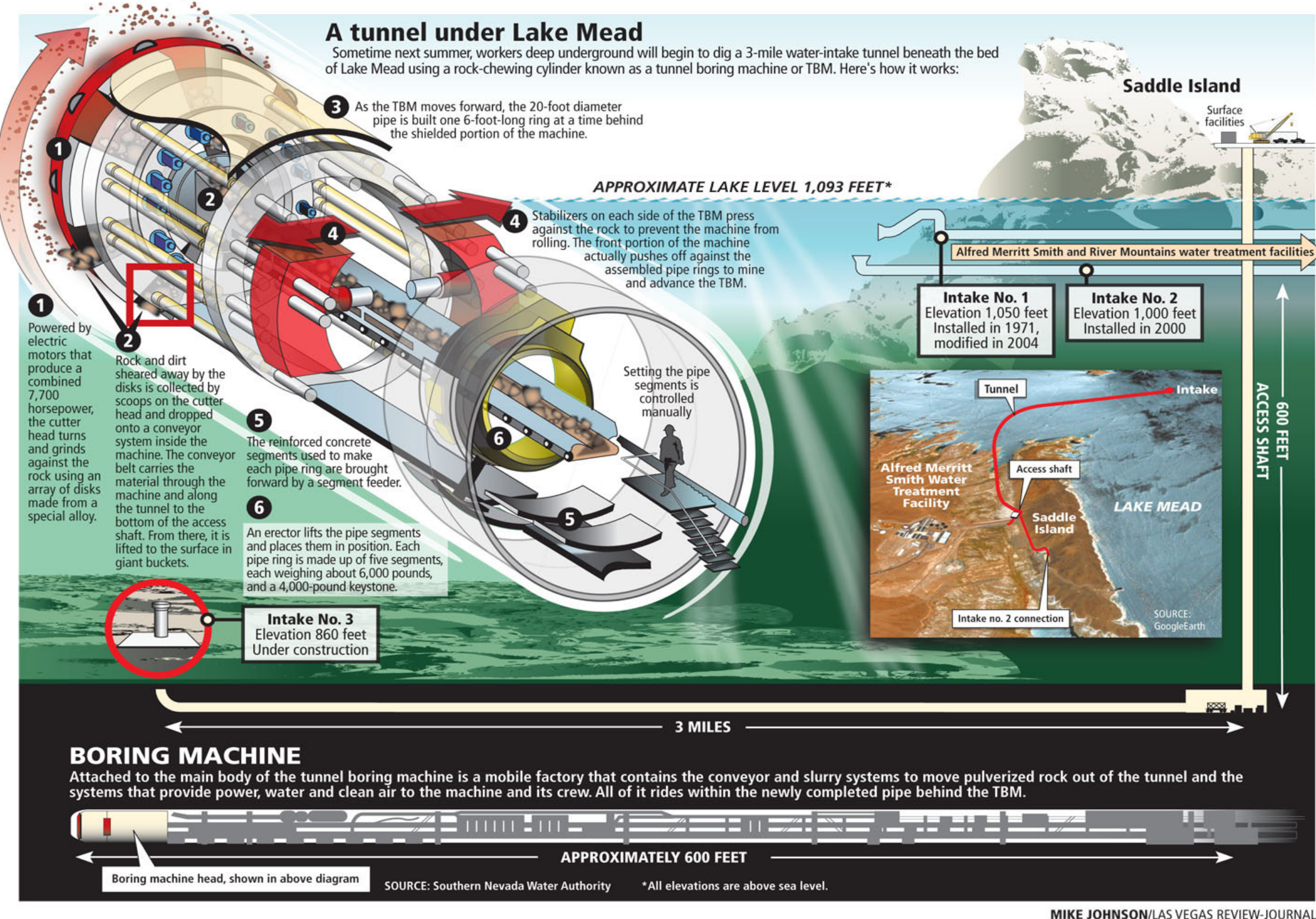
Designing your own drip irrigation system is not difficult to do, but it does require some careful planning. Make a drawing of the final installation design of your system, and keep it for your records.

- Group plants with similar water requirements such as trees, shrubs, ground covers and turf on separate valves.
- Design with consideration to pipe length, size and elevation changes.
- Plan for expansion. As your plants grow, you need to "grow" your irrigation system. Move emitters out to the plants! Origins where the feeder roots are located (additional emitters may be required). Record changes on your installation design.
- Select quality equipment. Spending a little money up front will save time and money later. Local irrigation suppliers are a good source of advice.

Drip irrigation is being increasingly used as a water efficient way plants growing with little loss to evaporation

Possible Long Term Solutions

- A third intake pipe will allow the valley to continue drawing water from Lake Mead through 2021 even if drought worsens
- A water pipeline to draw from the groundwater of the sparsely populated White Pine County in Northern Nevada ⁵
- Purchasing water from the Imperial Valley in Southern California
- Cloud seeding to encourage additional rainfall



As the water levels of Lake Mead threaten to fall below existing Intake pipes a third pipe will alleviate the immediate problem ¹

Conclusions

A record breaking drought and an explosion of growth have strained the water resources of Southern Nevada to their limits. Despite this challenge Las Vegas has taken great strides in rising to the occasion, its water system has become one of the most efficient in the nation. Many worry that Las Vegas has reached it's limit, but ever increasing conservation along with new public works projects will ensure that the city will continue to thrive into the foreseeable future.

References

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