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DROUGHT & WATER RESTRICTIONS

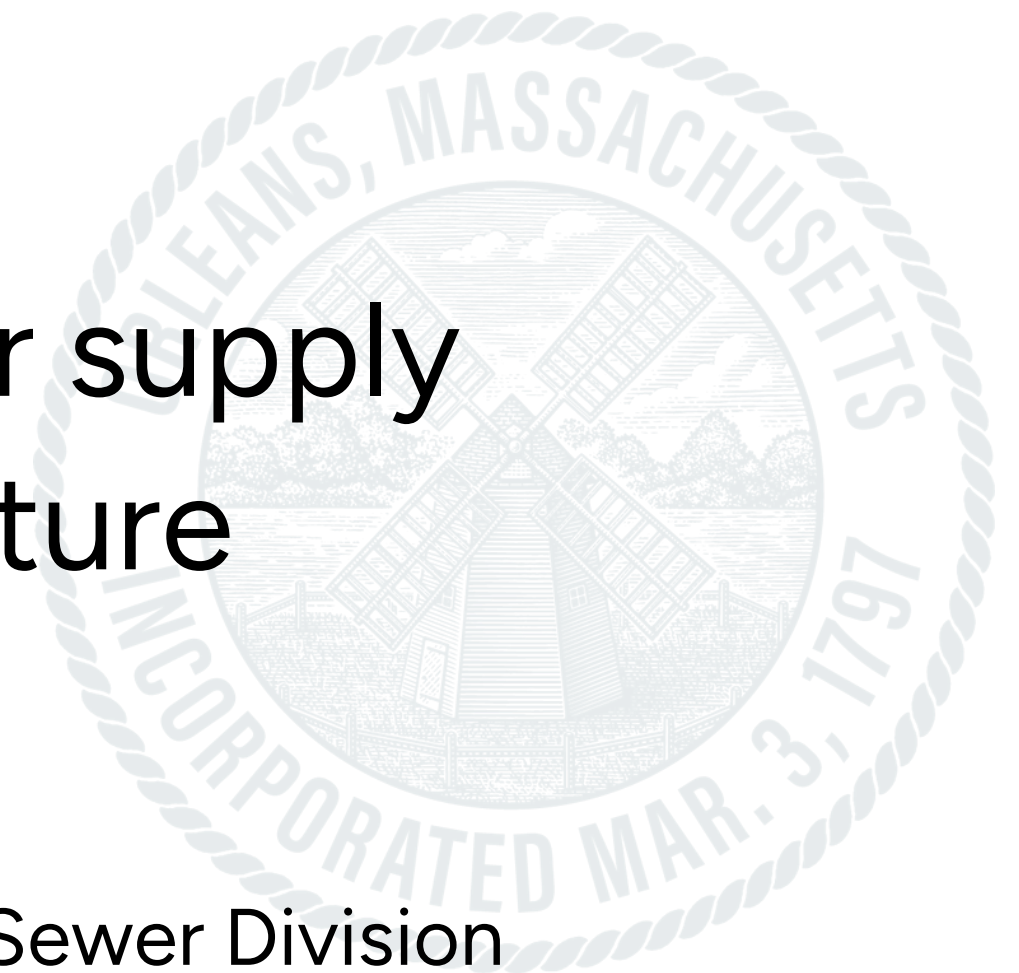
Protecting our water supply
today and for the future

Susan Brown

Water & Sewer Superintendent

Town of Orleans DPW – Water & Sewer Division

July 2026



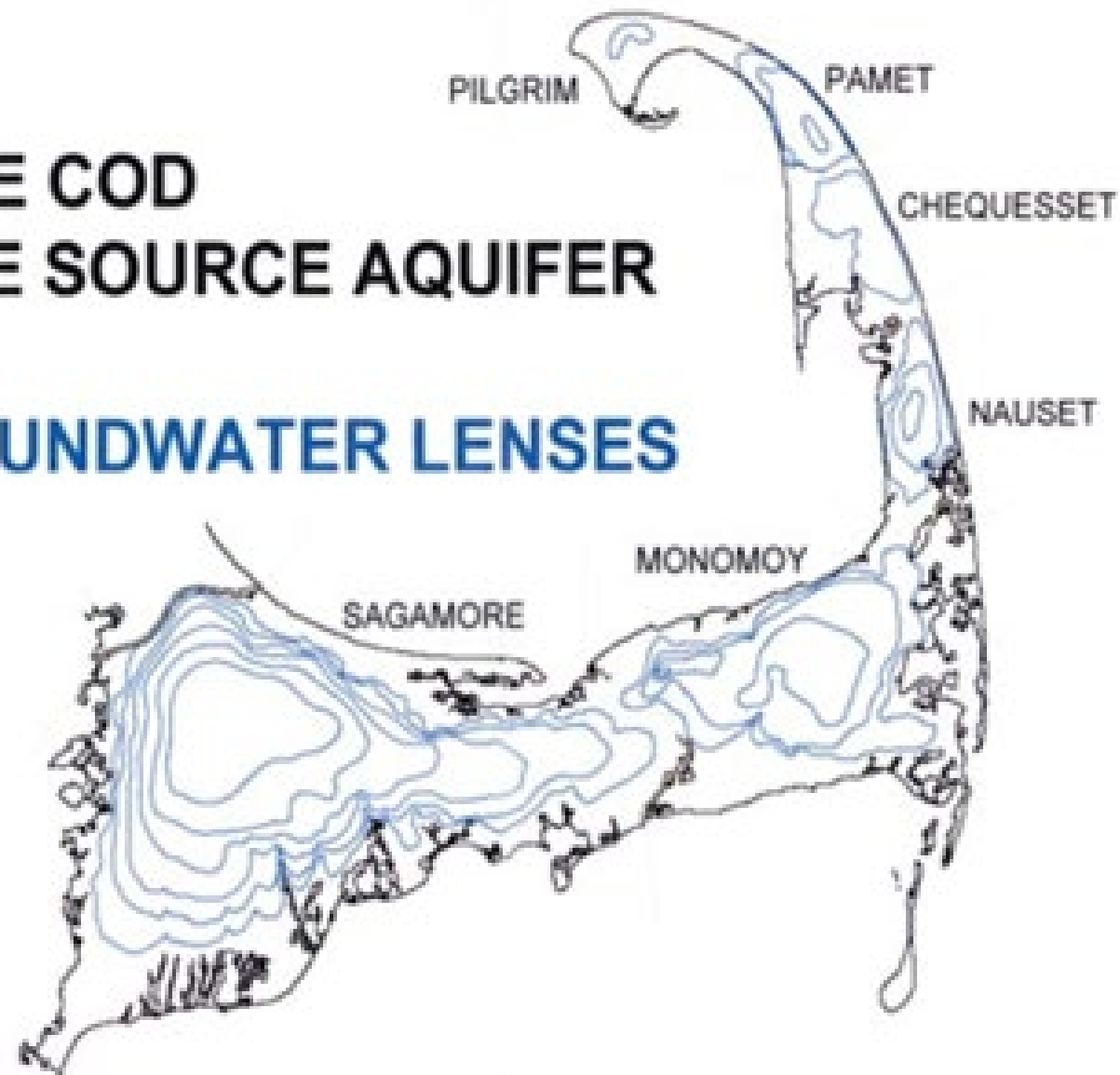
WHY WE'RE HERE TODAY

- Sole Source Aquifer
- Water demand is exceeding the rate of groundwater recharge
- Outdoor watering practices directly impact water demand
- Water Department challenges
- Water restrictions & community role

Sole Source Aquifer

CAPE COD SOLE SOURCE AQUIFER

GROUNDWATER LENSES



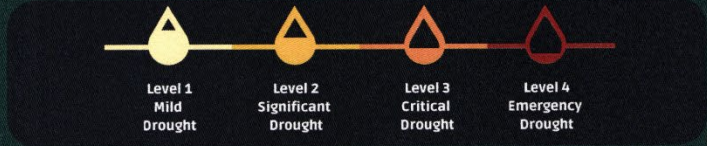
- The Cape Cod aquifer provides 100% of the Cape's drinking water and for this reason has been designated a "sole source aquifer" under the Safe Drinking Water Act by the Environmental Protection Agency.
- Six hydrologically separate lenses make up the Cape Cod aquifer.
- These mounds of groundwater that sit on top of saltwater are convex and therefore are referred to as lenses
- Harwich, Chatham, Orleans, Dennis and part of Yarmouth obtain water from the Monomoy Lens

Water Restrictions – Why water restrictions happen

- Drought reduces groundwater recharge
- Summer demand
- Protecting streams and wetlands
- Maintaining drinking water supplies
- Fire Protection
- State Regulations
 - Water Management Act Permit
 - Well level monitoring
 - Massachusetts Drought Task Force

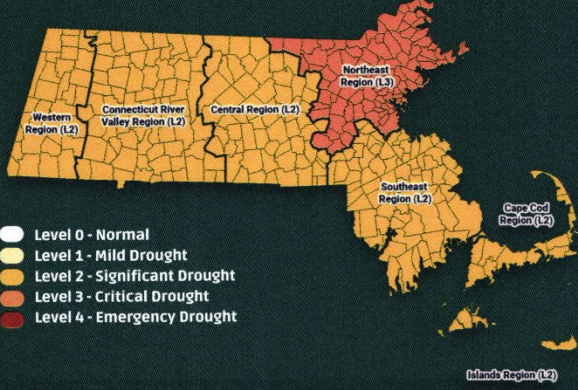
Massachusetts Drought Alert

July 10, 2026



Drought Alert Issued by:
Secretary of Energy and Environmental Affairs: Rebecca L. Tepper
Director of MEMA: Dawn Brantley

Drought Conditions Worsen in Western Region



By Region
Northeast Region remains at a **Level 3 - Critical Drought**.
Western Region now joins the Connecticut River Valley, Central, Southeast, Cape Cod, and Islands Regions at a **Level 2 - Significant Drought** due to worsening dry conditions.

Legend:
Level 0 - Normal
Level 1 - Mild Drought
Level 2 - Significant Drought
Level 3 - Critical Drought
Level 4 - Emergency Drought

Drought Video Series:

Video 1: [What does drought mean in MA?](#)
Video 2: [Why outdoor watering restrictions?](#)

Water Conservation Tips & Tools

Private Well owners information

Drought FAQ

Explore the [Native Plant Palette](#) tool and plan your garden to be more water-efficient! You can browse pre-made garden mixes or build one that specifically suits your needs, and then find a nursery to get your plants from!

What YOU can do

- STOP all non-essential outdoor use in Northeast Region (e.g., lawn/landscape watering, washing cars/driveways/decks, filling pools); Hand-held only in Level 2 Regions
- Fix any toilet or faucet leaks immediately by checking water meters for constant dial movement, using dye tabs for toilet leaks & inspecting pipes/fixtures regularly
- Use rain barrels
- Continue to minimize overall water use by:
 - Taking shorter showers (5 minutes or less)
 - Running dishwashers and washing machines only on a full load
 - Evaluating household water use & identify leaks with the [MA Home Water Use Calculator tool](#)

[Share your local drought impacts with us!](#)

Additional Resources

www.mass.gov/drought
[masswaters](#) [@masswaters](#) [@MassEEA](#)
[Boards of Health - report on local private wells](#)



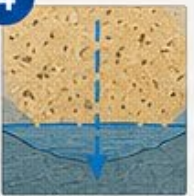
Why have water restrictions when we have had rain?

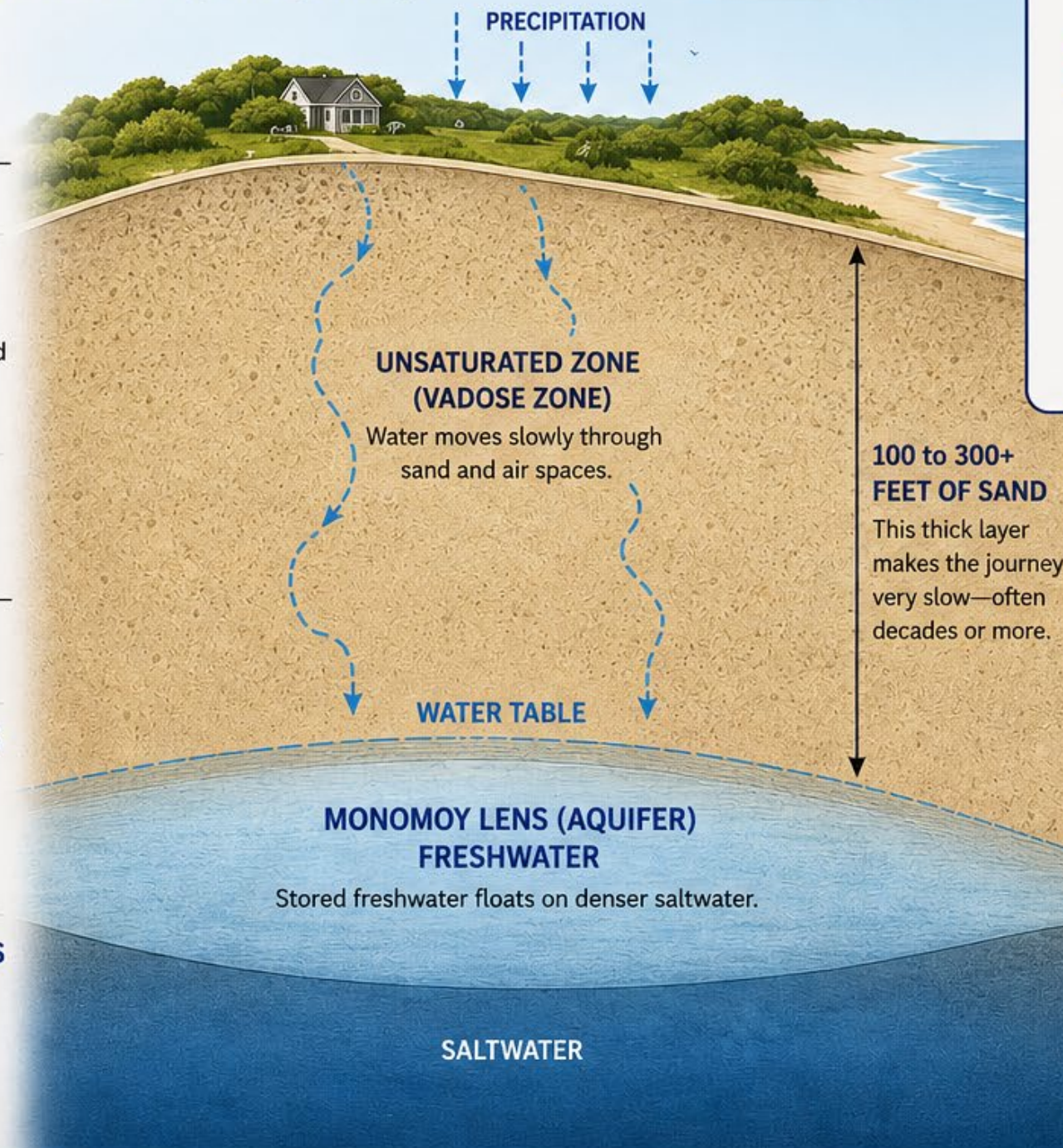
- A single heavy storm does not end a drought
 - More intense rainstorms, but less consistent rainfall
- Consistent rainfall is needed over time
- More runoff, less groundwater recharge
- Longer dry periods between rainfall
 - Increased drought frequency
- Groundwater recovery takes months or years
- Warmer average temperatures (Increased evaporation from soil and water)
- Less snowfall (slow melt during off season is most effective for recharge)



Why does it take precipitation so long to reach the Cape Cod Sole Source Aquifer?

Cape Cod's freshwater is stored in a natural underground lens of water called the Monomoy Lens. Getting there is a very slow journey.

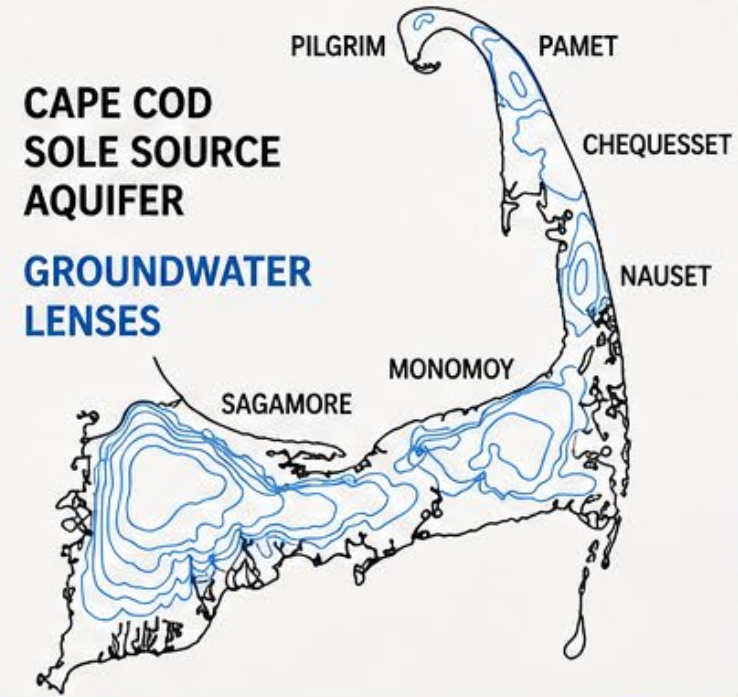
- **1 PRECIPITATION LANDS ON CAPE COD**
Rain falls on the sandy surface. Not all of it soaks in right away—some evaporates or runs off.
- **2 WATER SOAKS INTO SANDY SOILS**
Water slowly infiltrates downward through loose, coarse sand with lots of air spaces.
- **3 A LONG, SLOW JOURNEY THROUGH SAND**
Water moves very slowly—often just inches to feet per year—through 100s of feet of sandy sediments above the aquifer.
- **4 REACHES THE WATER TABLE**
After years to decades (often 10s of years or more), water reaches the top of the aquifer (the water table).
- **5 ENTERS THE MONOMOY LENS (AQUIFER)**
Water becomes part of the freshwater lens—floating on saltwater—and is stored for the long term.



CAPE COD GROUNDWATER LENSES

CAPE COD SOLE SOURCE AQUIFER

GROUNDWATER LENSES



WHY IT TAKES SO LONG

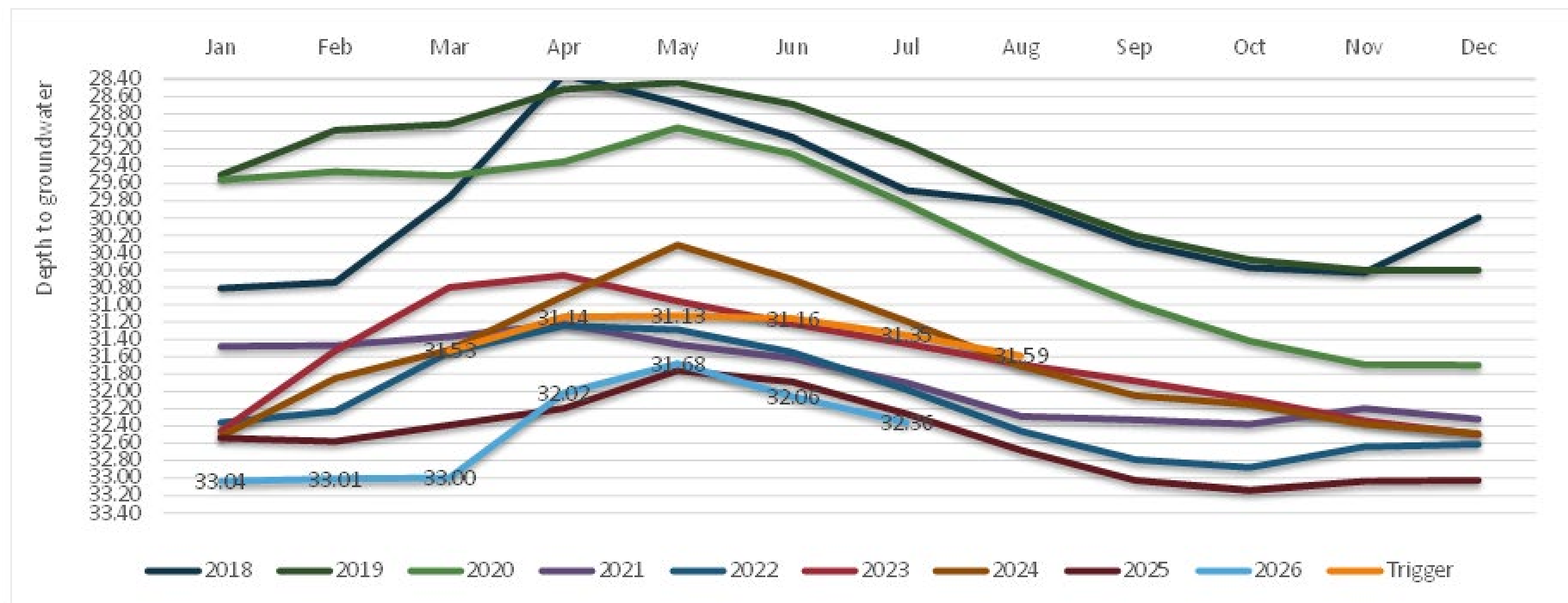
-  Water moves slowly through sand—far slower than in streams or pipes.
-  The aquifer is buried under 100s of feet of sand.
-  It can take 10s of years or more for a drop of rain to reach the aquifer.
-  This natural delay helps filter and protect our drinking water.



Every drop of water we use today may have started its journey decades ago.
Protect the land. Protect the lens. Protect our future.

Climate change impacts on water

- More frequent droughts and reduced groundwater levels



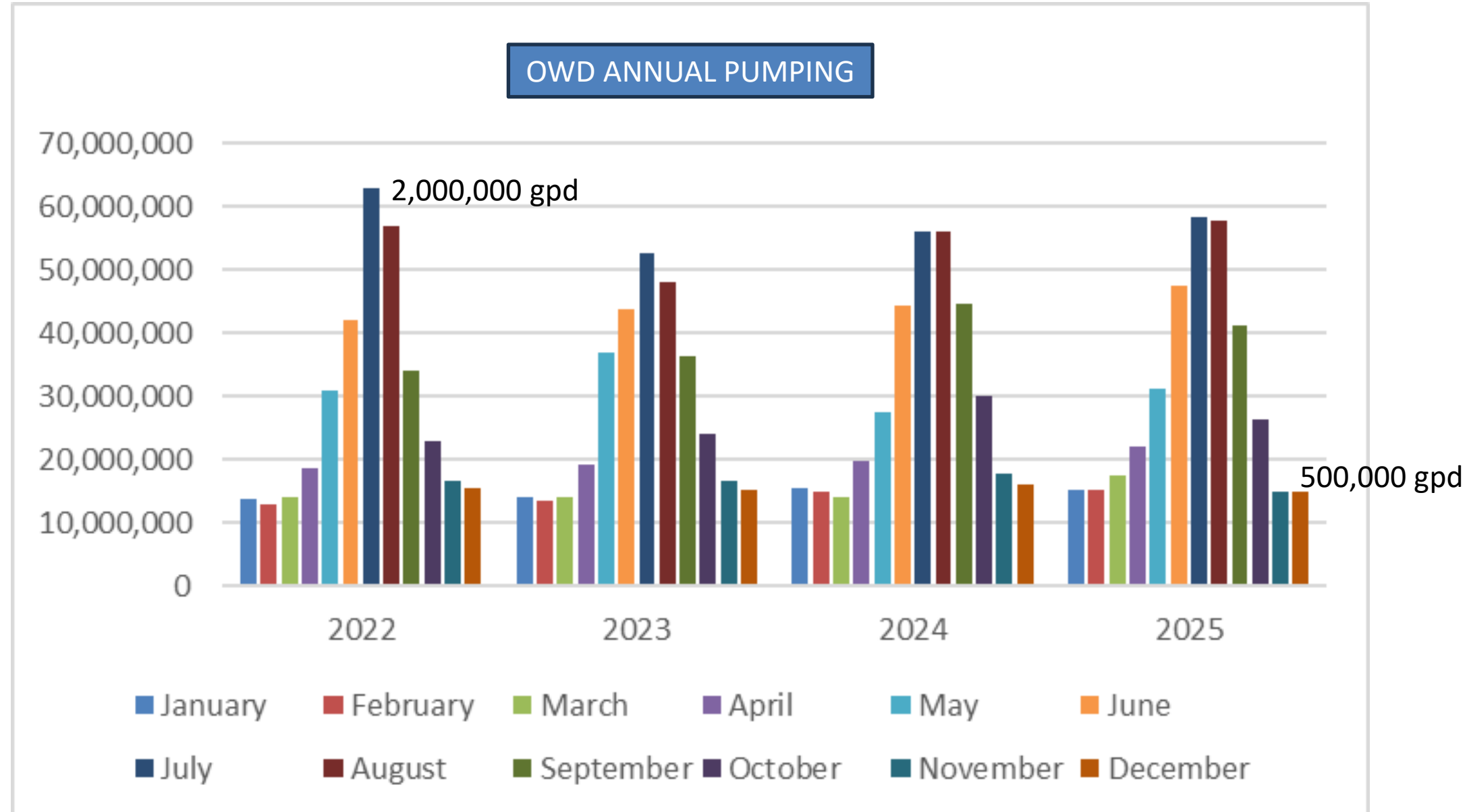
Summer Demand Problems

- Supply and demand
- 60% of summer increase is for outdoor use
- Reduced pressure in the system
- Strain on infrastructure
- Over pumping lowers groundwater levels
- Reduced recharge during droughts
- Saltwater intrusion risk



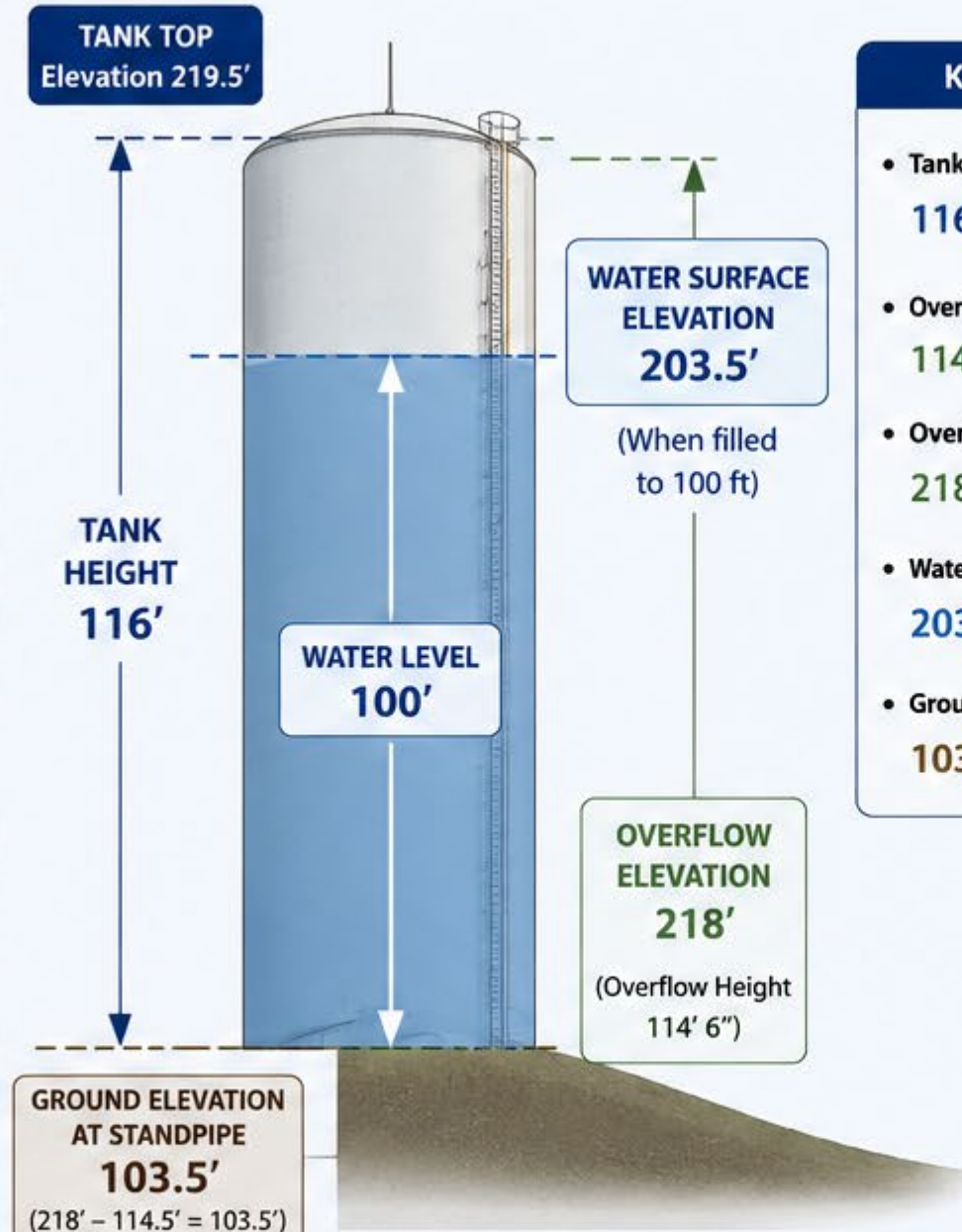
Summer Water Demand

- 2-3 times more water used in summer than winter
- Outdoor irrigation is main driver
- Strain on wells & infrastructure



ORLEANS WATER DEPARTMENT 116-FT STANDPIPE

Using Elevation to Deliver Reliable Pressure



KEY ELEVATIONS

- Tank Height (Ground to Top):
116'
- Overflow Height (Above Ground):
114' 6"
- Overflow Elevation:
218'
- Water Surface Elevation (100 ft):
203.5'
- Ground Elevation at Standpipe:
103.5'



HOW PRESSURE IS CREATED

Water stored in the standpipe at a higher elevation creates pressure.

Gravity causes water to flow from the standpipe through the distribution system to homes and businesses.

Pressure (psi) = (Water Surface Elevation – Customer Elevation) × 0.433

0.433 psi is the pressure created per foot of elevation.

PRESSURE IN DISTRIBUTION SYSTEM WITH WATER LEVEL AT 100 FT (ELEVATION 203.5')

CUSTOMER GROUND ELEVATION (Feet Above Sea Level)	ELEVATION DIFFERENCE FROM WATER SURFACE (Feet)	APPROXIMATE PRESSURE (psi)
0 ft	203.5	88 psi
25 ft	178.5	77 psi
50 ft	153.5	66 psi
75 ft	128.5	56 psi
100 ft	103.5	45 psi
125 ft	78.5	34 psi
150 ft	53.5	23 psi
175 ft	28.5	12 psi

Example: Most of Orleans is around 50 ft elevation.
Pressure with 100 ft of water in the standpipe:
 $(203.5 - 50) \times 0.433 = 66.5$ psi (approx.)

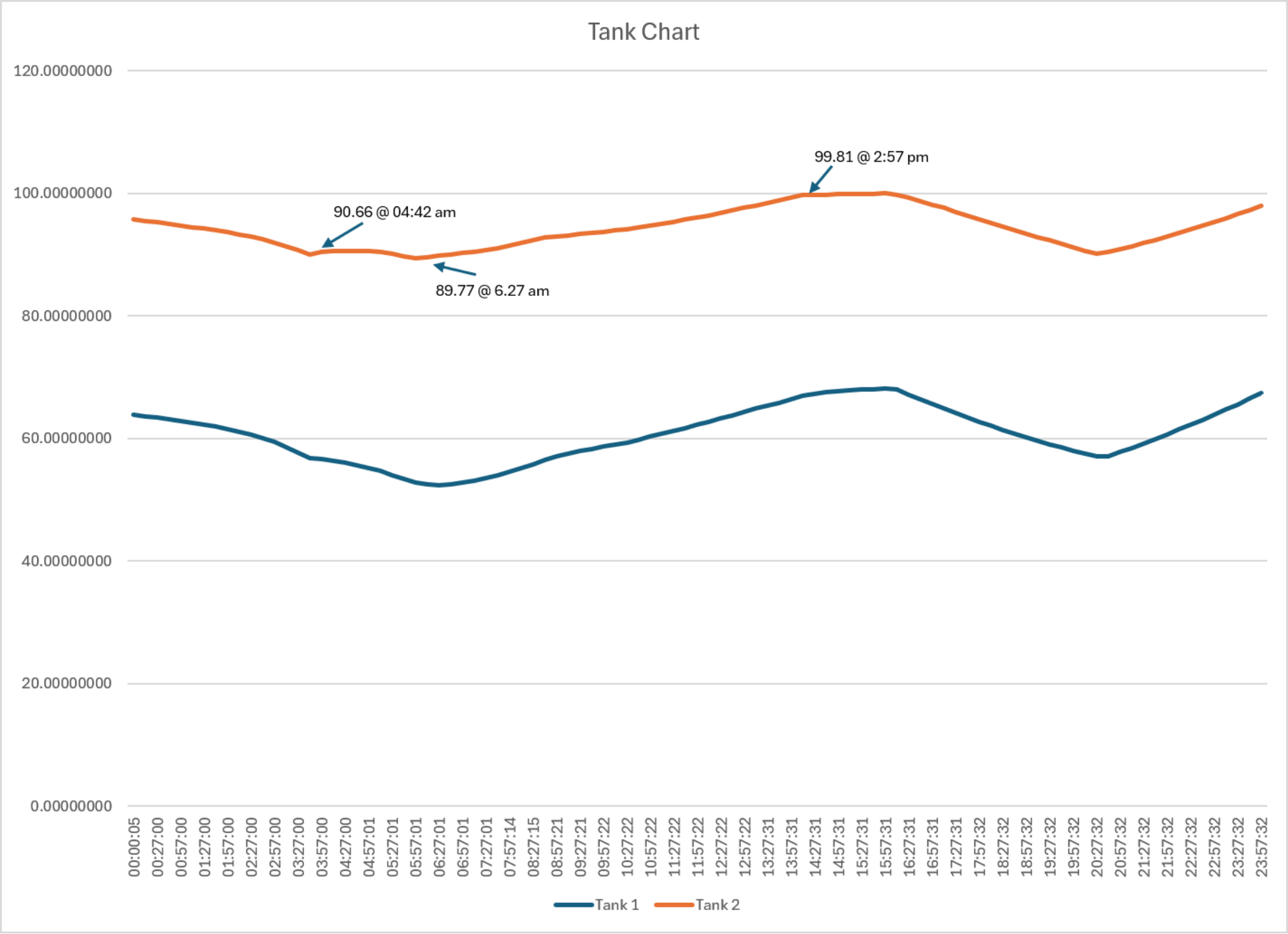
WATER FLOWS BY GRAVITY

From the standpipe (high elevation) through the mains to customers at lower elevations.



Elevations are based on the Town of Orleans Water Department datum.

Outdoor watering - Supply and demand



STATE REGULATIONS – PERMIT TO WITHDRAW WATER

Table 5. Seasonal Limits on Nonessential Outdoor Water Use

- Permittee must at a minimum implement the following outdoor water use restrictions:**
- Groundwater Level Triggered Restrictions from May 1st through September 30th**
- Nonessential outdoor water use is allowed no more than TWO DAYS per week before 9 am and after 5 pm whenever:
- Groundwater levels at USGS Monitoring Well 414630070014901 (BMW 22) Brewster, MA decline to or below the groundwater trigger for 60 consecutive days. The monthly trigger levels are listed below and are the period of record monthly 25th percentile depth to water level values, as determined and published by the USGS. Restrictions could start on May 1, so monitoring of BMW 22 begins on March 1 of each year. Once implemented, the restrictions shall remain in place until the daily value of the groundwater levels at the assigned USGS monitoring well have recovered to less than the trigger for 30 consecutive days (when the water table elevation has risen above the trigger level); and
 - A Drought Advisory or greater is declared by the Massachusetts Drought Management Task Force for Cape Cod.

Trigger Values for Outdoor Water Use Restrictions (feet below land surface)

March	April	May	June	July	Aug
31.53	31.14	31.13	31.16	31.35	31.59

River Basin	Registered Volume (mgd)	+	Permitted Volume (mgd)	=	WMA Authorized Withdrawal Volume (mgd)	-	Daily Avg. Water Use (mgd) (from Table BW-2 above)	=	Difference*
22-CAPE COD	0.86	+	0.41	=	1.27	-	1.02	=	0.25

* A positive difference indicates that the volume withdrawn is less than the authorized volume. A negative value indicates that more water was pumped than is authorized and that your PWS may be out of compliance.

Nonessential* Outdoor Water-Use Restrictions at Various Drought Levels

State Drought Condition (by Region)	Nonessential Outdoor Water-Use Restrictions
Level 1 (Mild Drought)	1 day per week watering, after 5 p.m. or before 9 a.m. (to minimize evaporative losses)
Level 2 (Significant Drought)	Limit outdoor watering to hand-held hoses or watering cans, to be used only after 5 p.m. or before 9 a.m.
Level 3 (Critical Drought)	Ban on all nonessential outdoor water use
Level 4 (Emergency Drought)	Ban on all nonessential outdoor water use

*Essential uses are defined by MassDEP as uses required: a) for health or safety reasons; b) by regulation; c) for the production of food and fiber; d) for the maintenance of livestock; or e) to meet the core functions of a business. Nonessential uses are those other than essential uses.

Water Restrictions and Community Role

- Water only when necessary. Water deeply but less often (lawns often are over watered)
- Brown is the new green (brown does not equal dead) usually comes back after rainfall.
- Water early morning to reduce evaporation
- Use drip irrigation or soaker hoses for targeted watering with less evaporation.
- Install rain sensors on irrigation
- Apply mulch to retain soil moisture

In Closing

- We need to work together to ensure a sustainable water future

“Conserving water today helps to ensure a reliable supply tomorrow”



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