



# RAW WATER CAPACITY MASTER PLAN

Crossville, Tennessee

October 1, 2019

5:00 P.M.

**WAUFORD**

J. R. WAUFORD & COMPANY, CONSULTING ENGINEERS, INC.

# Background Information

- City officials and Wauford met with COE/TDEC/EPA July 3, 2019 to discuss a path forward including raising the Meadow Park Lake Dam
- Calculated area of wetland loss and length of stream channel loss caused by inundation of increased Meadow Park Lake area and volume.
- Prepared draft Raw Water Master Plan outlining the timeline and costs for meeting future water demands

# Existing Facilities

## Water Treatment Plants

Water Treatment Plant	Current Capacity	Max Capacity
Meadow Park Lake WTP	3.5 MGD	14.0 MGD
Holiday Hills WTP	4.0 MGD	5.5 MGD
Total	7.5 MGD	19.5 MGD

## Reservoirs

Reservoir	Safe Yield
Meadow Park Lake	3.58 MGD
Holiday Hills Lake	5.34 MGD
Lake Tansi	3.50 MGD
Total	12.42 MGD

# Water Usage Forecast

## Moderate Growth Forecast

Usage Entity	Year 2037	Year 2067
Crossville	3.89 MGD	5.39 MGD
West Cumberland UD	0.46 MGD	0.63 MGD
Crab Orchard UD Growth	0.44 MGD	1.17 MGD
Industrial Growth	2.00 MGD	2.00 MGD
Unaccounted Water	1.27 MGD	1.71 MGD
<b>Total Raw Water Demand</b>	<b>8.06 MGD</b>	<b>10.98 MGD</b>

## High Growth Forecast

Usage Entity	Year 2037	Year 2067
Crossville	4.49 MGD	5.99 MGD
West Cumberland UD	0.53 MGD	0.70 MGD
Crab Orchard UD Growth	0.73 MGD	1.47 MGD
Industrial Growth	2.00 MGD	2.00 MGD
Unaccounted Water	1.44 MGD	1.89 MGD
<b>Total Raw Water Demand</b>	<b>9.19 MGD</b>	<b>12.05 MGD</b>

# Water Usage Forecast

## TDEC's 80% Rule

Meadow Park Lake WTP Capacity	3.5 MGD
Holiday Hills Lake WTP Capacity	<u>4.0 MGD</u>
	7.5 MGD

$$7.5 \text{ MGD} \times 0.80 = \mathbf{6.0 \text{ MGD}}$$

**Required to upgrade existing capacity of WTP's in 2030.**

# Water Supply Reservoirs

Prior to Raising Meadow Park Lake Dam

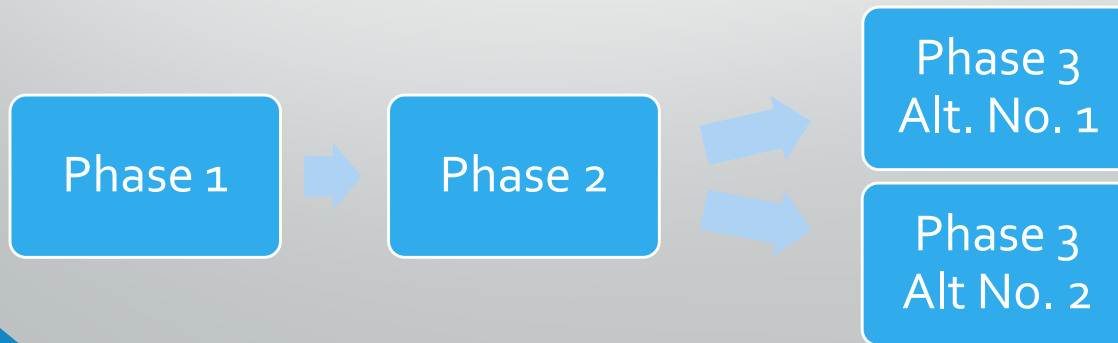
	Meadow Park Lake	Holiday Hills Lake	Lake Tansi
Year Constructed	1938	1960	1959
Reservoir Volume	3,069 AC-FT	3,573 AC-FT	9,000 AC-FT
Safe Yield	3.58 MGD	5.34 MGD	3.50 MGD
Surface Area	262 AC	223 AC	403 AC
Normal Pool Elevation	1,818.20 FT	1,761.25 FT	1,861.71 FT

After Raising Meadow Park Lake Dam

	Meadow Park Lake	Holiday Hills Lake	Lake Tansi
Safe Yield	<b>4.80 MGD</b>	5.34 MGD	3.50 MGD
Surface Area	<b>490 AC</b>	223 AC	403 AC
Normal Pool Elevation	<b>1,836.20 FT</b>	1,761.25 FT	1,861.71 FT

# Proposed Improvements

Phase	Proposed Improvements	Expected Construction Period
Phase 1	Raise Meadow Park Lake Dam	24 Months
	Relocate Meadow Park Lake Raw Water Intake	15 Months
Phase 2	Expand Meadow Park Lake WTP to 7.0 MGD	24 Months
Phase 3 Alt. No. 1	Expand Meadow Park Lake WTP to 12.25 MGD	24 Months
	Holiday Hills Lake Raw Water Intake Improvements	12 Months
	New Treated Water Distribution Line	12 Months
	Demolition of Holiday Hills WTP	3 Months
Phase 3 Alt. No. 2	Construct New 5.5 MGD Holiday Hills WTP	24 Months



# Chronology of Improvements

Phase	Year	Activity	Estimated Cost
	2019	Dam Permitting	\$75,000
Phase 1	2020	Dam Permitting	\$250,000
	2021	Dam Permitting	\$250,000
	2022	Dam Permitting	\$250,000
	2023	Dam Permitting	\$250,000
	2024	Dam/RWI Design	\$1,325,000
	2025	Dam /RWI Construction	\$12,000,000
	2026	Dam/RWI Construction	\$11,400,000
Phase 2	2030	Expand Meadow Park Lake WTP to 7.0 MGD	\$6,400,000
	2031	Expand Meadow Park Lake WTP to 7.0 MGD	\$7,000,000
Phase 1 & 2 total	2031		\$39,200,000
Phase 3 Alt. No 1	2040	Expand Meadow Park Lake WTP to 12.25 MGD/Holiday Hills Lake RWI Improvements/Distribution Line	\$30,855,000
Phase 3 Alt. No 2	2040	Construct New 5.5 MGD Holiday Hills WTP	\$26,775,000



# Water Bill Impact

Principal	Interest Rate	Yearly Payment – 30 year term	Approximate Water Bill Increase
\$39,200,000	SRF – 1.5%	\$1,630,720	\$7.55/month
\$39,200,000	Bond – 3.0%	\$1,999,200	\$9.24/month

# Next Steps

- Phase 1 Permit Work
- Develop and submit map of permit area to Corps of Engineers (COE).
- Superimpose property lines on COE permit areas.
- Send letters to affected property owners.
- Prepare RFP/acquire firm for baseline environmental assessment.
- Develop list of alternatives to proposed work (rely very heavily on previous reports).
- Meet with Interagency Review Team to discuss alternatives.
- Prepare RFP/acquire archaeological firm.
- Prepare scope/outline of compensatory mitigation plan.