

ENGINEERING REPORT

WATER SYSTEM COMPREHENSIVE PLAN

CITY OF MONETT, MISSOURI

November 2008



ALLGEIER, MARTIN AND ASSOCIATES, INC.

Consulting Engineers and Surveyors

ALLGEIER, MARTIN and ASSOCIATES, INC.

Consulting Engineers • Hydrologists • Surveyors

P.O. Box 2627
Joplin, MO 64803-2627

Phone: (417) 624-5703
FAX: (417) 624-7558

November 12, 2008

City of Monett
217 5th Street
Monett, Missouri 65708

Attn: Mayor Orr,
Commissioners Dierker and Brownsberger

Re: Water System Comprehensive Plan

Gentlemen:

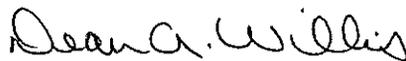
In accordance with our contract with the City of Monett, we present our Water System Comprehensive Plan.

The report analyzes system adequacy through the year 2030 and sets forth recommendations for improvements to meet current and future needs. Cost data is presented, along with background data, which serves as the basis for the recommendations.

We appreciate the opportunity to provide this service to the City of Monett. We solicit your comments on the report and look forward to meeting with you to discuss the report.

Very truly yours,

ALLGEIER, MARTIN AND ASSOCIATES, INC.



Dean A. Willis, P.E.
Vice President

DW:kt

ENGINEERING REPORT
WATER SYSTEM
COMPREHENSIVE PLAN
CITY OF MONETT, MISSOURI

November 2008



ALLGEIER, MARTIN AND ASSOCIATES, INC.
Consulting Engineers and Surveyors
Joplin, Missouri

TABLE OF CONTENTS

	<u>Page</u>
I. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	1
II. INTRODUCTION	3
A. Background	3
B. Scope	3
III. CURRENT CONDITIONS	4
A. General	4
B. Supply Wells	4
C. Elevated and Ground Storage	8
D. Distribution System	10
E. Water Usage and Pump Operation	11
IV. PROJECTED DEMAND FOR POTABLE WATER	14
A. Historical Water Usage	14
B. Residential Demand	16
C. Commercial Demand	19
D. Industrial Demand	19
E. Municipal Demand	20
F. Irrigation Demand	21
G. Unbilled Demand	21
H. Projected Water Demand	22
V. ASSESSMENT OF FUTURE DEMAND VERSUS PRESENT SYSTEM CAPACITY	23
A. Supply Wells	23
B. Storage	25
C. Distribution System	26
VI. RECOMMENDATIONS	29
A. Supply Wells	29
B. Storage Facilities	31
C. Treatment Facilities	32
1. Conventional Treatment	33
2. Ballasted Flocculation Treatment	35
3. Trident Facilities	36
4. Treatment Facility Operation and Maintenance	38
D. Distribution System	38
E. Summary of Costs	40
1. Capital	40
2. Operation and Maintenance	41
3. Financing	42

FIGURES

- Figure 1 Monett Water Supply Wells and Water Storage Facilities
- Figure 2 Monett Missouri City Water Map
- Figure 3 Monett Distribution System Pressure Contours
- Figure 4A Water Pumpage and Sales (01/04 thru 01/06)
- Figure 4B Water Pumpage and Sales (01/06 thru 01/08)
- Figure 5A Water Pumpage and Sales vs. Peak Day Pumpage (01/04 thru 01/06)
- Figure 5B Water Pumpage and Sales vs. Peak Day Pumpage (01/06 thru 12/07)
- Figure 6 Peak Month vs. Average Month Pumpage to System
- Figure 7 Population Projections
- Figure 8 Pressure Contours With Waterline Modifications

APPENDICES

- Appendix "A" Water Well Data (2003-2007)
- Appendix "B" Water Well Pump Operation (2003-2007)
- Appendix "C" Water Pumped to System (2003-2007)
- Appendix "D" Monthly Water Sales (2003-2007)
- Appendix "E" Annual Water Sales (2003-2007)
- Appendix "F" Evaluation of Deep-Wells-Only Alternative

**ENGINEERING REPORT
WATER SYSTEM COMPREHENSIVE PLAN
CITY OF MONETT, MISSOURI**

I. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The City of Monett operates a water supply and distribution system that serves not only the City's residents, but also significant industrial and commercial development. In order to allow for reliable delivery of water to its current customers, while also providing capacity needed for growth of the City, improvements to the water system are needed.

An extensive investigation of the Monett water system was undertaken to assess current and future water demands, and to determine the ability of the facilities to meet system needs. Based on the results of this study, the following can be concluded:

- 1) Adequate delivery of water to Monett's system relies heavily on the continued operation of Wells No. 9 and 12. The loss of either well places in doubt the City's ability to meet current demands.
- 2) Wells No. 9 and 12 are subject to periodic spikes in turbidity, requiring the City to pump these wells to waste until the water clears.
- 3) While the majority of Monett's distribution system is of adequate size and configuration, several areas currently face limitations in fireflow capacities and/or have marginal system pressures.
- 3) Monett's water storage system is marginally adequate for current system demands, but will need to be expanded in the future.
- 4) Increases in residential, commercial, or industrial water demands will need to be accompanied by corresponding increases in water supply, distribution, and storage capabilities.
- 5) A funding mechanism is needed to pay for costs associated with improvements to the system.

Significant improvements to the Monett water system are needed to insure that current and future water supply needs are met. After evaluating current facilities in light of short-term and long-term needs, it is recommended that the City undertake the following water improvement program:

1. Construct a water treatment facility to operate in conjunction with Wells No. 9 and 12 thereby insuring the uninterrupted delivery of high quality drinking water from these two large capacity wells.
2. Install a waterline west along Highway 60 to a point of connection with existing Well No. 19 at the City airport. Install a larger pump in the airport well, thereby increasing the in-town well capacity by approximately 550 gallons per minute.
3. Construct waterlines from the Lowe's area north and southwest to resolve low pressure problems in the areas near Wells No. 15 and 16.
4. Install a booster pump station in the area of the North Park Tank, and provide an interconnecting waterline to the east, to supplement the water supply to that portion of the system served by the Lowe's tower.
5. Construct a booster pump facility at an Industrial Park Tank to allow for use of water stored in the lower part of the tank to meet short-term peak demands.

The total capital costs of the previously recommended improvements are estimated at \$13,330,000. If financed with a low interest SRF loan, the annual debt service cost for the recommended capital improvements equals approximately \$855,000 per year. The operation, maintenance, and replacement costs associated with the treatment of the water from Wells No. 9 and 12 adds an estimated \$400,000 per year to the system costs. The total estimated cost increase of \$1,255,000 per year equates to a cost of approximately \$1.23 per thousand gallons of water currently sold.