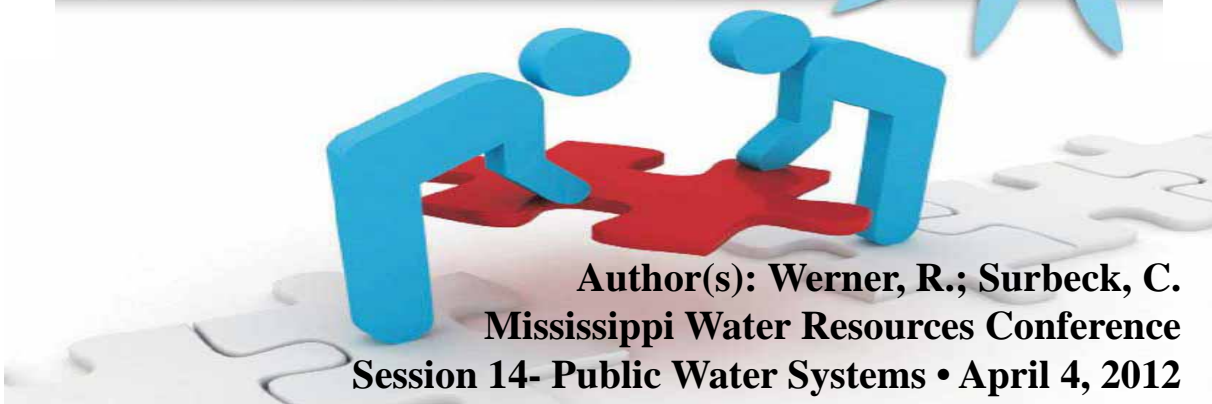


Financial Sustainability of Water Treatment and Distribution: Using a Public Private Partnership Toolkit to Evaluate Project Financial Viability



**Author(s): Werner, R.; Surbeck, C.
Mississippi Water Resources Conference
Session 14- Public Water Systems • April 4, 2012**

MOTIVATION

America's drinking water systems face an annual shortfall of at least \$11 billion to replace aging facilities that are near the end of their useful lives and to comply with existing and future federal water regulations. This does not account for growth in the demand for drinking water over the next 20 years. Leaking pipes lose an estimated 7 billion gallons of clean drinking water a day.

WATER AND ENVIRONMENT
DRINKING WATER 2009 GRADE **D-**

GOAL

RAISING THE GRADES SOLUTIONS
 THAT WILL WORK NOW

- A = Exceptional
- B = Good
- C = Moderate
- D = Poor
- F = Failing

AMERICAN INFRASTRUCTURE G.P.A. **D**

ESTIMATED 5-YEAR FUNDING REQUIREMENTS FOR DRINKING WATER AND WASTEWATER

Total investment needs
\$68 BILLION

Estimated operating
\$144 BILLION
 Projected shortfall
\$106 BILLION

- ★ **INCREASE** funding for water infrastructure system improvements and associated operations through comprehensive federal funding.
 - ★ **CREATE** a Water Infrastructure Fund to finance the construction of infrastructure under the Clean Water Act. The Drinking Water Act provides for water management programs designed to improve water quality.
 - ★ **EMPLOY** a range of financing mechanisms, such as appropriations from general treasury funds, issuance of revenue bonds and tax exempt financing at state and local levels, public-private partnerships, state infrastructure banks, and user fees on certain consumers.
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- products as well as innovative financing mechanisms, including broad-based environmental restoration taxes to address problems associated with water pollution, wastewater management and treatment, and storm-water management.

Source: American Society of Civil Engineers (2009). "Facts about Drinking Water." *2009 Report Card for America's Infrastructure*. Reston, VA: ASCE. 25.

PUBLIC PRIVATE PARTNERSHIP

Public Private Partnership (PPP) involves:

1. Relation between **government and a concessionaire**—one or more private companies (consortium)
2. **Agreement upon funding, building and operating** a usually government-provided service*

*In the water sector, government has been the principal supplier of water infrastructure systems

FRAME OF DISCUSSION

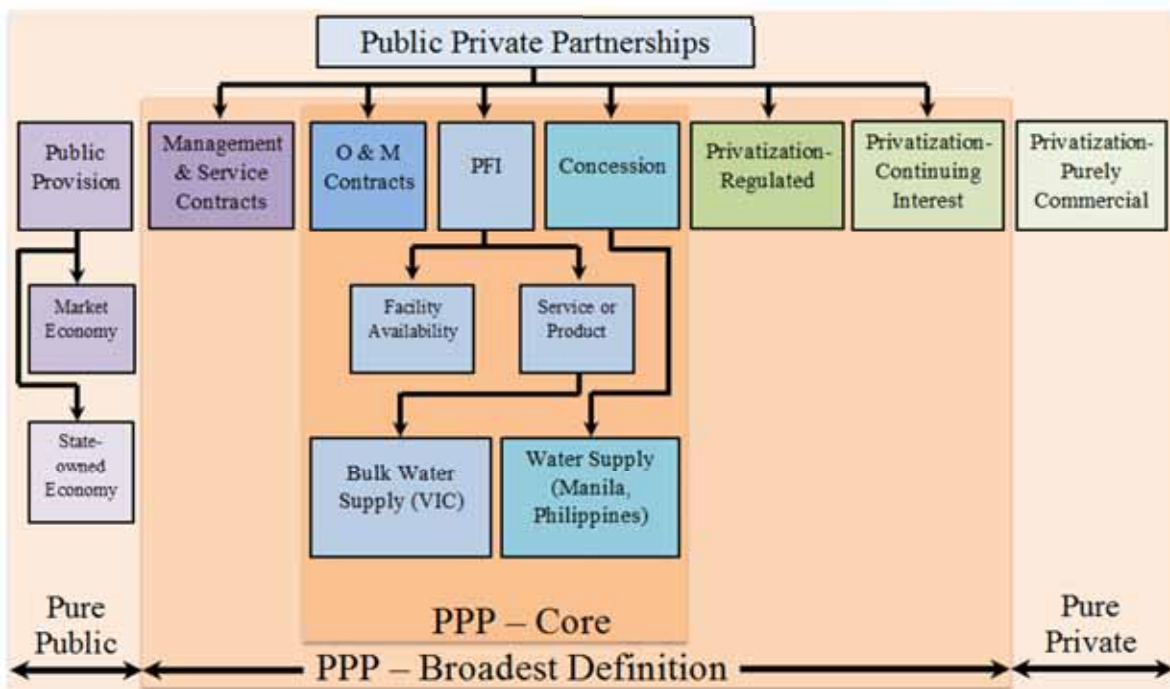
Public Private Partnership (PPP) in water treatment and distribution

How a PPP project can attract private investors

Adapting the existing Public-Private Infrastructure Advisory Facility highways toolkit model to the water sector—developing the new model in Excel

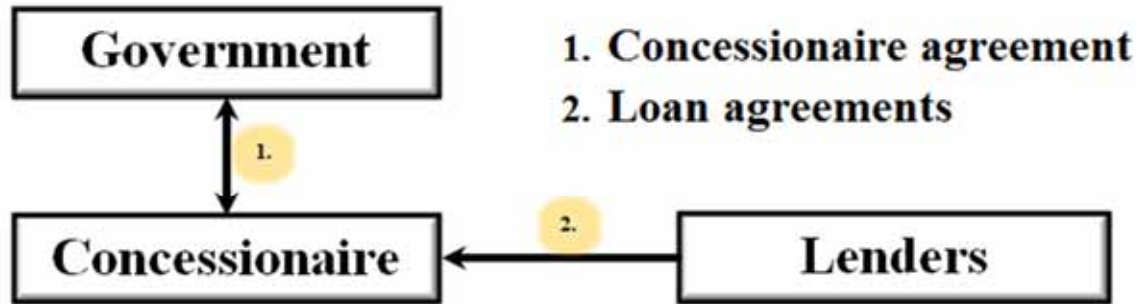
Example case study: Oxford, MS water treatment plant project

PPP FRAMEWORK



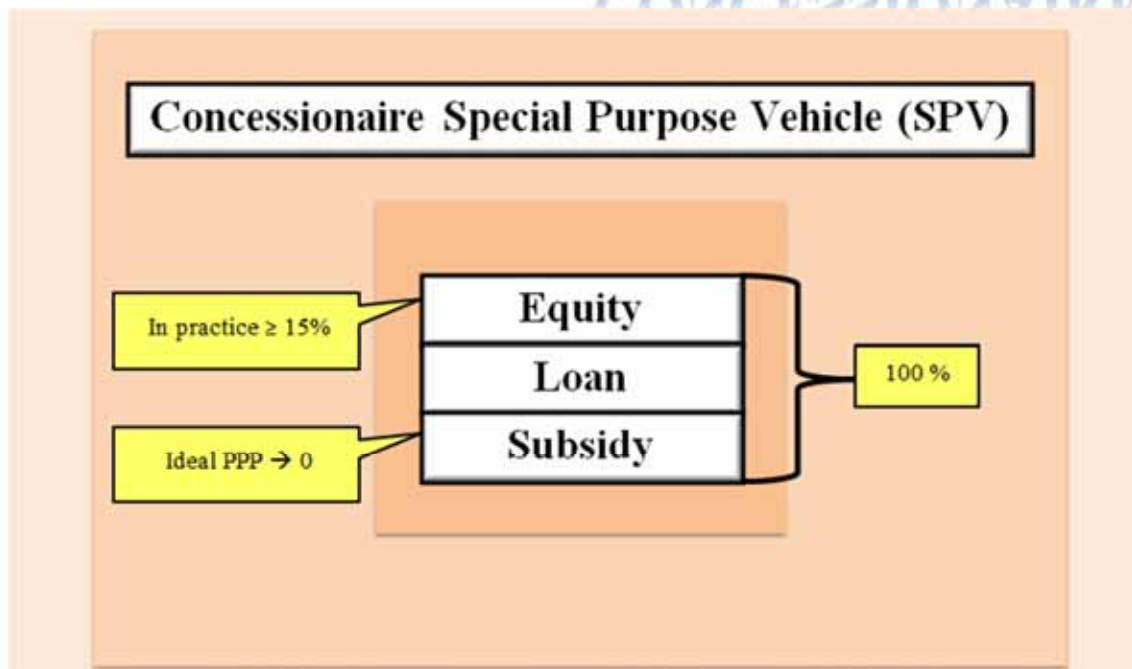
Source: Public-Private Infrastructure Advisory Facility (2010). "PPPs: An Introduction." *PPP Training Resources*. Washington, DC: The World Bank Group. 10. Modified. Accessed from http://www.ppiaf.org/ppiaf/sites/ppiaf/files/documents/PPIAF_Intro_to_PPPs.pdf.

SPECTRUM OF FINANCING PPP



Source: Queiroz, C. (2011). [Drawing of The World Bank Group and PPP Relationship]. Washington, DC: The World Bank Group. Modified.

CAPITAL STRUCTURE OF CONCESSIONAIRE



Source: Queiroz, C. (2011). [Drawing of Concessionaire Special Purpose Vehicle Consortium Capital Structure]. Washington, DC: The World Bank Group. Modified.

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ATTRACTION TO PRIVATE INVESTORS

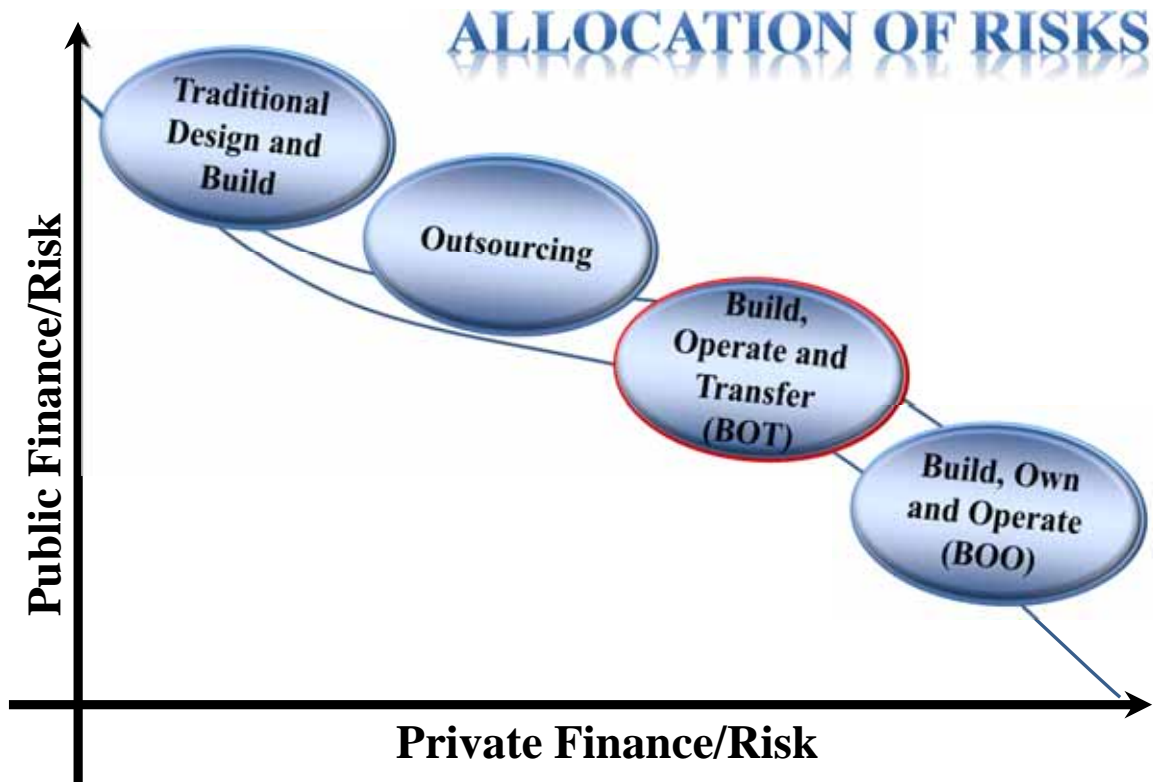
Why **private participation** in water?

1. Wide **variation of capital investment**
2. **Appropriately shares risks** with public sector
3. Ways to assess **financial feasibility**

“The **real issue for PPP** is not public infrastructure versus private infrastructure. It is simpler: the issue is **less infrastructure versus more.**”

–Clive Harris, PPP Manager of The World Bank Group

Public sector is subjected to budget constraint



Source: Public-Private Infrastructure Advisory Facility (2010). "PPPs: An Introduction." *PPP Training Resources*. Washington, DC: The World Bank Group. 9. Modified. Accessed from http://www.ppiaf.org/ppiaf/sites/ppiaf.org/files/documents/PPIAF_Intro_to_PPPs.pdf.

NEW MODEL ASSUMPTIONS

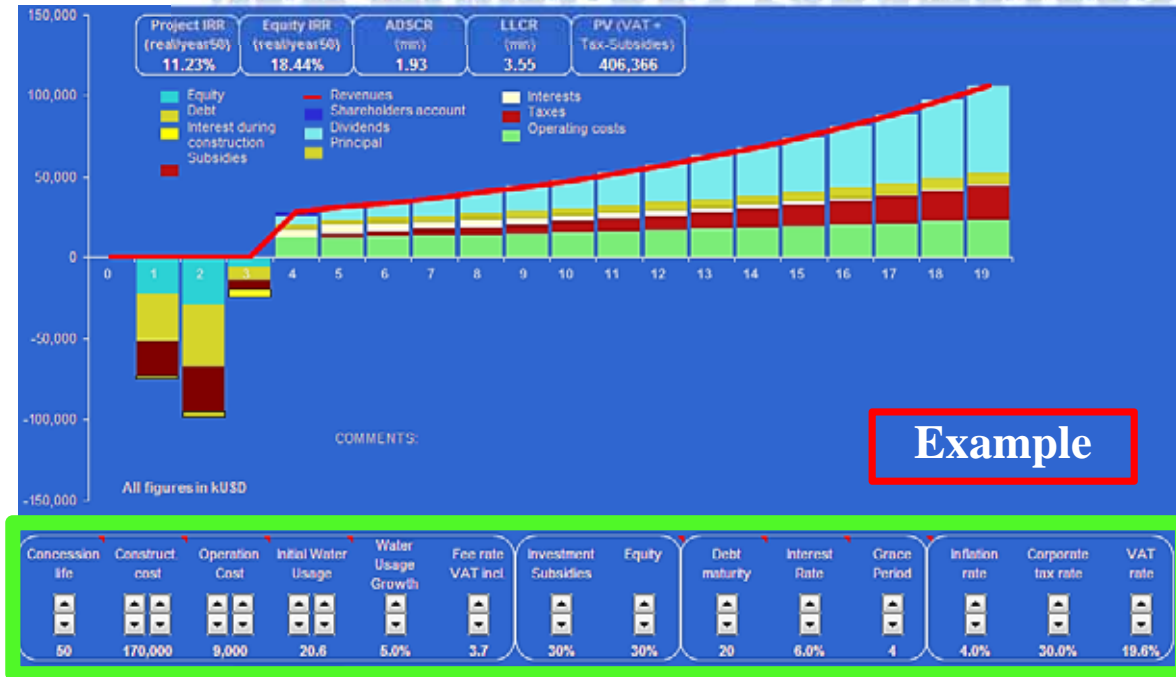
Summary of project assumptions

Source of funds		Construction costs (VAT excluded, indexed on inflation)		
Subsidies	30%	Duration of works (years)	4	years
Equity	30%	Year	%	Amount (MUSD)
Credit	40%	1	0%	0
Nominal interest rate	6.0%	2	40%	68
Repayment period	20 years	3	50%	85
Grace period	4 years	4	10%	17
Capitalization	4 years		0%	
Repayment of loan	<input type="button" value="P+I constant"/>			
		Total in MUSD		170.00
		Amortization	45	years
Water Usage and Tariff		Operation costs (indexed on inflation)		
Initial water usage	20.6 ×1000 m ³ /d	Fixed part	9,000	kUSD per year
Water usage growth	5% per year	Variable part	0.1	USD per m ³
Fee rate (VAT included)	3.7 USD per m ³			
(VAT excluded)	3.1 USD per m ³			
(indexed on inflation)				
Initial revenue	63.7 kUSD / d			
(VAT excluded)				
		Economic		
		Inflation rate	4.0%	
		Corporate tax rate	30%	
		VAT rate	19.6%	
		State discount rate (real terms)	4.0%	
		(nominal terms)	8.16%	

Example

Source: PPIAF (2009). "Graphical Model for Financial Simulation of Highway PPP Projects." *Toolkit for Public-Private Partnerships in Roads & Highways, 1st Edition*. Washington, DC: The World Bank Group. 1. Modified. Accessed from http://www.ppiaf.org/ppiaf/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/financial_models/index.html.

NEW MODEL KEY PARAMETERS



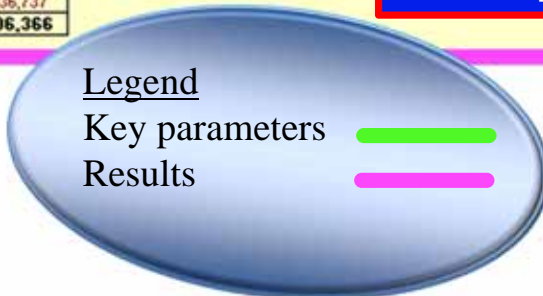
Source: PPIAF (2009). "Graphical Model for Financial Simulation of Highway PPP Projects." *Toolkit for Public-Private Partnerships in Roads & Highways, 1st Edition*. Washington, DC: The World Bank Group. 2. Modified. Accessed from http://www.ppiaf.org/ppiaf/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/financial_models/index.html.

NEW MODEL RESULTS

SUMMARY OF THE RESULTS

FINANCING PLAN		SOURCES (in kUSD)	
Uses (in kUSD)	197,427	Investment subsidy	56,715
Construction costs (nominal terms)	169,050	Equity	56,715
Capitalised Interests	8,378	Debt	83,997
FINANCIAL RATIOS		SHAREHOLDERS' RETURN	
Minimum ADSCR (Annual Debt Service Coverage Ratio)	1.93	Project IRR after tax (real terms)	11.23%
Minimum LLCR (Loan Life Coverage Ratio)	3.55	Project IRR after tax (nominal terms)	15.68%
Minimum PLCR (Project Life Coverage Ratio)	18.94	Equity IRR (real terms)	18.44%
PUBLIC AUTHORITIES' FINANCIAL FLOWS		Equity IRR (nominal terms)	23.18%
PV on Subsidy (kUSD)	-45,890		
PV on the VAT (kUSD)	215,519		
PV on the Corporate Taxes (kUSD)	236,737		
PV on the State revenues (kUSD)	406,366		

Example



Source: PPIAF (2009). "Graphical Model for Financial Simulation of Highway PPP Projects." *Toolkit for Public-Private Partnerships in Roads & Highways, 1st Edition*. Washington, DC: The World Bank Group. 5. Modified. Accessed from http://www.ppiaf.org/ppiaf/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/financial_models/index.html.

FRAME OF DISCUSSION

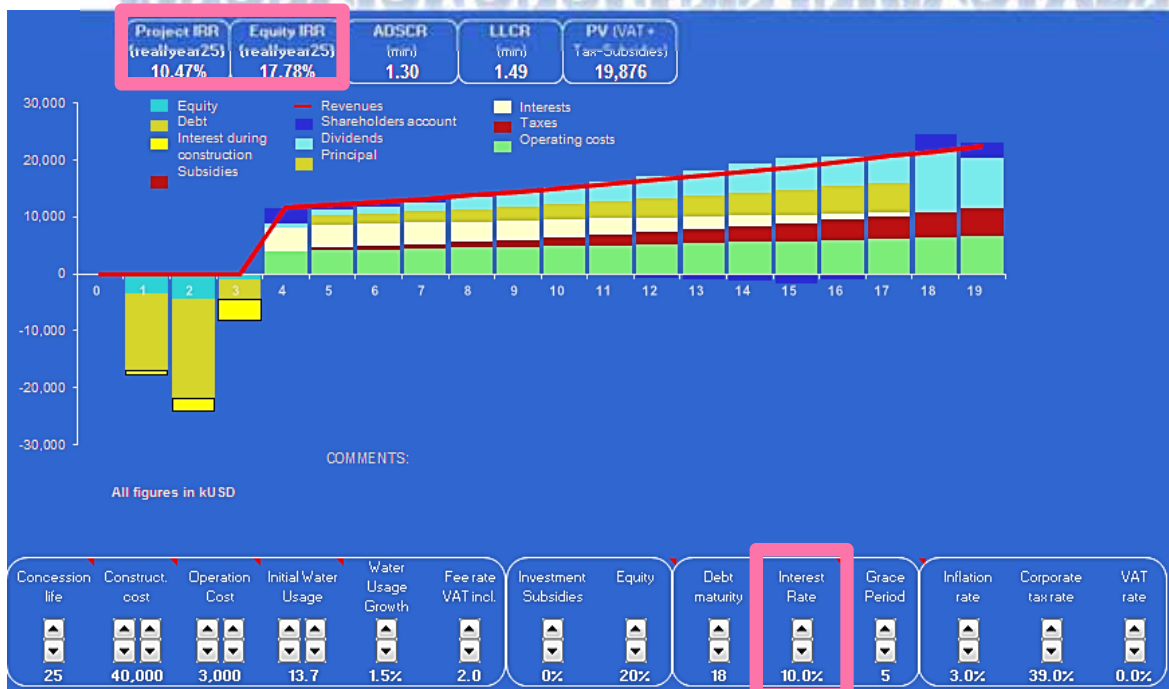
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FINANCIAL ANALYSIS INDICATORS



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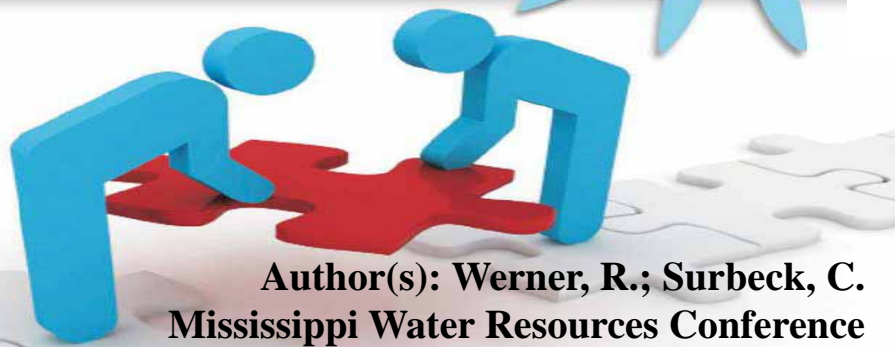
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**Thank
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