



<b>Project Title</b>	<b>CIP 1410 – Water Works Park WTP Chlorine System Upgrade</b>
<b>Project Significance</b>	WWP Chlorine System has experienced numerous leaks and has compromised the safety of plant

## 1. PROJECT SUMMARY INFORMATION

**Date Business Case Prepared** Click dropdown to enter date. **Project Origin** Project Origin

<b>Project Manager/Sponsor</b>	Todd King	Engineer	WSO Engr
	Todd.king@glwater.org		313-799-0289
<b>CMG Rep</b>	Name	Title	Division
	Email		Phone

### Other Project Team Members

Name	Title	Division	Phone	Email
Balvinder Sehgal	Plant Manager	WSO WWP	313-926-8110	Balvinder.sehgal@glwater.org

<b>Site Name</b>	Water Works Park
<b>If Facility, Facility Address</b>	10100 East Jefferson, Detroit, MI
<b>Service Area</b>	Water Operating Services
<b>Project Category</b>	Water Treatment & Operations
<b>Project Type</b>	Construction
<b>Primary Focus</b>	Chlorine Disinfection System at Water Works Park
<b>Previous Project Status</b>	New - Active Planning
<b>Current CIP Project Status</b>	New - Active Planning

## 2. PROJECT INFORMATION

### Project Photo & Map



### Photo Caption

The Water Works Park Chlorine System has experienced several leaks and requires complete replacement.

The Water Works Park storage room will have an updated scrubber system to neutralize up to 4000 lbs of chlorine gas.

### Preliminary Scope of Work

The WWP Chlorine System suffered a major leak in 2014. Since that time, additional leaks and maintenance issues have occurred on a more frequent basis. Due to the toxicity of chlorine gas, this project is a high priority to protect worker safety and the general public.

### History / Background

The WWP facility began serving customers with finished water in 2003. More recently, the chlorine system has had one major leak and several minor leaks on a recurring and more frequent basis. Since chlorine is a highly toxic material, yet integral for providing finished water in accordance with the Safe Drinking Water Act, a study and design project was initiated under the CIP allowance as project CS-1721. This construction project will be based on the study and design conducted under that work. In addition, the original design was oversized relative to the current operating conditions and resulted in operational problems due to the turndown required.

### Preliminary Scope of Work

Demolition and replacement of all mechanical systems, equipment and piping related to chlorine transport, vaporization and application. New chlorine system will be able to meet current dose rates and be able to meet future loadings estimated for WWP after the Northeast WTP treatment system is taken off line.

**Related projects currently underway or planned**

CS-1721 is the study and design project for this proposed work. It is currently underway and at 50% design completion as of March 2017. Also, this project must be completed prior to the decommissioning of the Northeast WTP treatment process.

**Potential Challenges**

It will be critical for the contractor to phase the work to provide ongoing chlorine application during the retrofit.

**Other – important project information, photos, etc. not fitting in other**

Click here to enter text; box will expand if more space is needed.

**Additional Reference Documents:** Use button below or include file path to network location.

Double-click here to Insert File



G:\001\_Contracts\  
CS-1721 SCP WWP C

Enter filepath for network file, or attach file using button to the left.

### 3. PROJECT DRIVER

**Primary criteria driving project**

5 - Public Health & Safety

**Explanation**

The current system is experiencing leaks and must be replaced as soon as practicable.

### 4. PROJECTED PROJECT COSTS & SCHEDULE

Definitions are available if you hover over a blue underlined word. Numbers are in thousands unless otherwise noted.

**Life Cycle Cost:** The total discounted dollar cost of owning, operating, maintaining, and disposing of a facility or equipment over a period of time.

**Life Cycle Cost Analysis:** It is an economic evaluation technique that determines the total cost of owning and operating a facility over a period of time.

**Present Value:** The current value of one or more future cash payments discounted at some appropriate interest rate.

**Salvage Value:** The estimated value of an asset at the end of its useful life.

**Equivalent Annual Cost:** The annual cost of owning an asset over its entire life.

**Book Values for Existing Assets** – Contact CMG for Book Values and identify all WAM Asset ID's for assets being modified/replaced/rehabbed

Asset Name	WAM Asset ID	Book Value	Treatment
Chlorine System	WAM Asset ID	Book Value	Rebuild, rehab, replace, etc.

Cost Estimate Source Engineer EstimateDate of Cost Estimate 2/6/2017 Prepared By CDM Smith Division Consultant

## Initial Capital Cost Estimate

**This table to be filled out in initial iteration of document only.** Please use actual costs where possible. Include all phases of project. Record numbers in thousands and **type 0 if there is no cost in a particular year** (the calculation will not work properly if the cells are left blank).

\*P.E. = Projected Expenditures

Phase	Status	Start Date	End Date	Lifetime Actual Thru FY 2016	FY 2017 P.E.	FY 2018 P.E.	FY 2019 P.E.	FY 2020 P.E.	FY 2021 P.E.	FY 2022 P.E.	FY 2023 & Beyond	Phase Total
Construction	New	9/1/2017	9/1/2018	\$0	\$0	\$500	\$8500	\$0	\$0	\$0	\$0	\$9,000
Design	Active	7/8/2016	1/25/2018	\$0	\$290	\$200	\$200	\$0	\$0	\$0	\$0	\$ 690
Year Expenditure Totals				\$ 0	\$ 290	\$ 700	\$8,700	\$ 0	\$ 0	\$ 0	\$ 0	\$9,690

[Double-click here to update table calculations](#)

## Capital Cost Estimate Update

**This table to be updated when project is updated.** Please use actual costs where possible. Include all phases of project. Record numbers in thousands and **type 0 if there is no cost in a particular year** (the calculation will not work properly if the cells are left blank).

Phase	Status	Start Date	End Date	Lifetime Actual Thru FY 2016	FY 2017 P.E.	FY 2018 P.E.	FY 2019 P.E.	FY 2020 P.E.	FY 2021 P.E.	FY 2022 P.E.	FY 2023 & Beyond	Phase Total
Choose/add phase.	Select Status	Start date	End date	\$0	\$(000s)	\$0	\$0	\$0	\$0	\$0	\$0	\$ 0
Choose/add phase.	Select Status	Start date	End date	\$(000s)	\$(000s)	\$(000s)	\$(000s)	\$(000s)	\$(000s)	\$(000s)	\$(000s)	\$ 0
<b>Year Expenditure Totals</b>				\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

Double-click here to update table calculations

#### Notes

See attached BODR Table 7-1 for construction cost estimate. Study/Design/Services During Construction are part of SCP-CS-1721 and are denoted as "Design" on above table.

## 5. ALTERNATIVES EVALUATION

**Alternative**  
(Pick)

**Replace with Upgrade**

**Description of Alternative Evaluation**

Replace existing system with current technology that will be able to reliably meet existing conditions and scale to ultimate Water Master Plan Update projections for WWP post NE treatment decommissioning.

**Alternative**  
(Pick)

Alternative Method Type

**Description of Alternative Evaluation**

Include description & financial calculations, ROI, REI, Cost/Benefit ratio, etc.

#### Please describe any other alternatives evaluated:

Due to the issues of ongoing leaks, alternative technologies were not evaluated. However, literature indicates that chlorine via ton cylinders is roughly half the LCA of solution or on-site generation.

## 6. PROJECT MANAGER PRIORITIZATION ANALYSIS

Provide details as necessary to support in the boxes below. Higher scores require more detailed justification. For scoring purposes the Project Manager shall consult the “Capital Improvement Project (CIP) Prioritization Guidance Document” which can be found below.



Guidance  
Document - 08-12-2016

Criteria	Project Manager Score (0-5)	Details
1) Condition	5	Leaks are a regular occurrence for the current system.
2) Performance (Service Level / Reliability)	4	System is operational, but suffers regular leaks.
3) Regulatory (Environmental / Legal)	4	System could fail severely if not replaced soon.
4) O&M	5	Excessive leaks and PM required.
5) Public Health & Safety	5	Catastrophic consequences if safety system fails.
6) Public Benefit	5	Chlorine required for SDWA compliance. New system will provide greater protection to public.
7) Financial	3	High maintenance costs on current system.
8) Efficiency	5	Current system is run in manual mode and does not allow flow pacing.
Preliminary Score (Auto-calculates based on above scores)		

## 7. PRIORITIZATION ANALYSIS – For CIP Committee Use Only

**Prioritization Criteria.** For all criteria, indicate score (0-5) from evaluation and justification for the score. Project Manager will do the initial scoring and justification in section 9. The CIP Committee will review and update the score and provide justification if different than PM score.

Refer to the Prioritization Criteria Definitions Document for detailed direction (Section 6 above).

Double-click here to update table calculations

Criteria	<u>Project Manager Score</u>	CIP Committee Score (0-5)	Calculated Score	CIP Committee Justification
1) Condition 12%	5	Score 0-5	0.00	If different from PM Score.
2) Performance (Service Level / Reliability) 15%	4	Score 0-5	0.00	If different from PM Score.
3) Regulatory (Environmental / Legal) 18%	4	Score 0-5	0.00	If different from PM Score.
4) O&M 11%	5	Score 0-5	0.00	If different from PM Score.
5) Public Health & Safety 17%	5	Score 0-5	0.00	If different from PM Score.
6) Public Benefit 8%	5	Score 0-5	0.00	If different from PM Score.
7) Financial 10%	3	Score 0-5	0.00	If different from PM Score.
8) Efficiency 9%	5	Score 0-5	0.00	If different from PM Score.
Total Modifier Points			Enter Modifier Points	Explain modifier points – how many given due to which criteria?
Total Score			0.00	

Modifier points are decided by the CIP Review Committee as outlined in the Prioritization Guidance Document.

Double-click here to update table calculations

**8. ASSET MANAGEMENT GROUP COMPLETENESS CHECK***Completed by Asset Management Group.*

Data completeness check

Complete

**9. DOCUMENT REVISION HISTORY***Completed by PM/Business Case Owner.*

Name	Date of Change	Reason for Change
Todd King	3/14/2017	Original Draft Submitted – Revised 3/17/17

**10.FINAL BUSINESS CASE REVIEW AND APPROVAL****Identification of In-house responsibility:**

Click here to enter who is taking responsibility in-house.

I recommend approval of this Project/Change Authorization Request:

Approval Type	Name	Date
Project Manager	Todd King	3/17/2017
	Todd King	
Manager	Digital signature	Date
	Manager Name	
Chief	Digital signature	Date
	Chief Name	

Double-click here to update the summary page



REQUEST FOR C.I.P. PROJECT NUMBER

New CIP 115004

CIP #: 1410

Project Title: Water Works Park WTP Chlorine System Upgrade Contract Number: \_\_\_\_\_  
Description: \_\_\_\_\_  
Lead Division: \_\_\_\_\_ Division Leader: \_\_\_\_\_  
Project Manager: Water Engineering Phone: \_\_\_\_\_ Department Charged: Water ☒ Sewage ☐  
Project Type: Study (S) \_\_\_\_\_ Design (D) ☒ Construction (C) ☒ Construction Management (CM) \_\_\_\_\_ Construction Assist. (CA) or Design Build Assistance (DBA) \_\_\_\_\_ Design Build (DB) \_\_\_\_\_ Both Purchase Order (PO) or Information Technology (IT) \_\_\_\_\_  
CIP Budgeted Amount: 2018-2022FY \$ 9,400 Estimated Start Date \*: \_\_\_\_\_ Estimated Completion Date \*: \_\_\_\_\_

In-House Project Costs

Project Costs													
GL Account #	GL Description	Rate	Amount	FY 2015 & Prior	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 +	Total
601995	Capital Allocation: Salaries & Wages		\$ -	\$ -	\$ -	\$ -							-
601997	Capital Allocation: Fringe Benefits	40%	-										-
601998	Capital Allocation: Nonpersonnel	5%	-										-
616900	Construction		-				500	8,500				-	9,000
617950	Contractual Engineering Service		-			290	200	200				-	690
Jill: Need GL Code	Materials		-										-
617960	Other Capital Improvement Costs		-										-
Project Total			\$ -	\$ -	\$ -	\$ 290	700	8,700	-	-	-	-	9,690
Funding Source(s)													
Water Construction Bonds			\$ -	\$ -	\$ -	\$ 290	\$ 700	\$ 8,700	\$ -	\$ -	\$ -	\$ -	\$ 9,690
Water I&E			-										-
Sewer Construction Bonds			-										-
Sewer I&E			-										-
Project Total			\$ -	\$ -	\$ -	\$ 290	\$ 700	\$ 8,700	\$ -	\$ -	\$ -	\$ -	\$ 9,690

PROJECTED EXPENDITURES FOR EACH FISCAL YEAR ( 000 )									
( 000 )	FY 2016-17 and Prior	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	Remaining	TOTAL	
WSS	\$290	\$700	\$8,700	\$0	\$0	\$0	\$0	\$9,690	
SDS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

Requested By: \_\_\_\_\_ Date: \_\_\_\_\_  
Division Manager: \_\_\_\_\_ Date: \_\_\_\_\_  
Division Director: \_\_\_\_\_ Date: \_\_\_\_\_  
Capital Management Group (CMG) - FUNDS AVAILABLE: ☐ Yes ☒ No ☐ CMG Date: \_\_\_\_\_  
(circle applicable funding source): Bond I&E  
Budget Approval: \_\_\_\_\_ Finance Manager: \_\_\_\_\_ Date: \_\_\_\_\_  
Accounting Approval: \_\_\_\_\_ Accounting Manager/ General Ledger: \_\_\_\_\_ Date: \_\_\_\_\_  
Authorization to Proceed: \_\_\_\_\_ Chief Executive Officer/ Chief Operating Officer: \_\_\_\_\_ Date: \_\_\_\_\_

W Fund No: 0 Cost Center: \_\_\_\_\_ Object No: \_\_\_\_\_ WSS Project No.: \_\_\_\_\_  
S Fund No: 0 Cost Center: \_\_\_\_\_ Object No: \_\_\_\_\_ SDS Project No.: \_\_\_\_\_