

November 1, 2022

Jeff Dunsworth, P.E. Assistant City Engineer 15500 Sun Light Near Way, #B, Bldg 6 Pflugerville, Texas 78691

Subject: City of Pflugerville

Water Treatment Plant Expansion

Bid Review and Recommendation of Award

Dear Mr. Dunsworth:

Ardurra has completed our review of the competitive sealed proposal for construction of the Water Treatment Plant Expansion project. The proposal was received and publicly opened by the City at 2:00 P.M. on Friday, September 9, 2022.

One proposal was received from PLW Waterworks, LLC. Attached to this letter is the Bid Tabulation Sheet (Attachment A) for your review.

Bid Proposal Review

Ardurra reviewed the proposal to ensure that all the required forms and documentation were submitted and signed.

Ardurra also verified all the bid calculation and tabulations. One mathematical error was found in Table A. Based Bid Price. Bid item No. 3 was incorrectly calculated in the bid tab and the correct number should be \$152,000. The bid proposal submitted includes the following:

Α	Total lump sum base bid prices	\$148,869,566.00
В	Total Cash Allowance	\$631,000.00
	Total Base Bid Price (A+B)	\$149,500,566.00
С	Total Additive Alternate Bid Prices	\$2,599,434.00
	Total Bid Price (A+B+C)	\$152,100,000.00



The following factors are identified that contribute to the increase in the construction costs and the gap between Engineer's estimate and bid price:

- Labor Workforce Shortage: The water/wastewater bid market is very active in Texas and both General Contractors and Subcontractors are experiencing skilled labor shortage and retention challenges. Several General Contractors decided not to bid the project due to current backlog and not being able to staff the project. PLW revealed that they have to relocate skilled labor that is not locally available to the project site. They expect 5% annual escalation on skilled labor.
- Availability of Materials and Cost Escalation: Construction material cost escalation is also a large factor in the increase in the expected bid price. Over the course of the project, material cost escalation occurred in April 2021, October 2021 and March 2022. A recent escalation took place after the 100% deliverable during the bidding phase in June 2022. Engineering News-Record (ENR) Materials Price Index, which tracks the price movement of concrete, steel, lumber, etc. has reported an overall material cost increase of 55% from January 2021 to September 2022. Concrete prices alone have increased by 38% from May 2022 to September 2022.
- Project Constructability and Phasing Complexity: The WTP Expansion project involves expansion and new construction at an operational facility. Maintenance of plant operation (MOPO) is critical to the success of the project. With existing construction constraints and key interim critical path milestones, the Contractor has to stack trades and place multiple crews to work simultaneously.

Cost Optimization

To help the City to manage the total bid price, Ardurra, the City, PLW Waterworks, LLC., and Garver (city OR) have conducted multiple collaborative work sessions and identified several cost optimization opportunities, as summarized below:

- Schedule optimization to allow additional time to the 1st construction milestone
- Relocation of chemical facility to avoid installation of temporary bypass piping
- Miscellaneous electrical design optimization
- Miscellaneous process piping and valve optimization

These items provide additional cost savings but still retain 30 MGD expansion for the project with key design features intact. These savings amount to a net total of \$5,843,317.00 as shown in Attachment B – Cost Savings Summary.



In addition, several original additive alternate items and the membrane basin recoating have been converted to Cash Allowance as requested by the City, in a total amount of \$1,053,975.00. The cost savings and allowance changes are summarized below and reflected in the Bid Tabulation included as Attachment A.

Α	Total lump sum base bid prices	\$142,853,417.00
В	Total Cash Allowance	\$1,684,975.00
	Total Base Bid Price (A+B)	\$144,538,392.00
С	Total Additive Alternate Bid Prices	\$1,718,290.52
	Total Price (A+B+C)	\$146,256,682.52

With the accepted cost savings, the final negotiated construction cost for this project is \$146,256,682.52.

Recommendation for Award

Therefore, Ardurra recommends that the subject contract be awarded to PLW Waterworks, LLC. in the amount of \$146,256,682.52.

Please review this information and feel free to contact me at (713) 208-9463, or by email at ysun@ardurra.com if you have any questions or need any additional information.

Very truly yours,

Yue Sun, P.E., BCEE

Project Director

TBPE Firm Registration No F-10053

Enclosures

Attachment A - Bid Tabulation

Attachment B – Cost Savings Summary

Attachment C – Membrane Additive Cost Breakdown

cc: File

PFLUGERVILLE WATER TREATMENT PLANT EXPANSION PFLUGERVILLE, TEXAS

A. BASI	E BID PRI	CE		Engineer 100% OPCC PLW											
Bid Item					Unit Price Bid	00%		Unit Price Bid							
No.	Quantity	Unit	Bid Item Description		Numbers		Bid Amount		Numbers		Bid Amount				
1	1	LS	Mobilization, Bonds and Insurance (not to exceed 5% of Total Bid Amount).	\$	5,234,796.00	\$	5,234,796.00	\$	6,069,000.00	\$	6,069,000.00				
2	1	LS	Installation of Stormwater Pollution Prevention Plan (SWPPP) control measures to comply with requirement of the SWPPP including Furnish all materials and incidents	\$	50,000.00	\$	50,000.00	\$	46,000.00	\$	46,000.00				
3	19,000	LF	Furnish all labor, equipment, materials, tools and profes-sional engineer's services to provide trench safety (all depths and pipe sizes) in accordance with all appli-cable City, State and Federal laws, ordi-nances, rules and guide-lines, complete in place.	\$	8.00	s	152,000.00	\$	8.00	\$	152,000.00				
			a. Lake Raw Water Pump Station. Construct expanded Lake Raw Water Pump Station with installation of two (2) new vertical turbine pumps, copper ion generation system and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents, excluding procurement costs for the pumps as described in Item 12.	\$	4,479,248.00	\$	4,479,248.00	\$	3,595,000.00	\$	3,595,000.00				
			b. Pretreatment. Construct new four train pretreatment system including static mixing, flocculation basins, sedimentation basins, electrical building and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents.	\$	22,309,230.00	\$	22,309,230.00	\$	27,281,812.00	\$	27,281,812.00				
			c. Membrane Filtration. Construct membrane filtration system retrofit complete in place including required demolition of existing facilities, installation of low head strainers, membrane replacement and improvements, construction of membrane clean in place chemical system, construction of new blower building, construction of a new membrane drain pump station, the construction of a new membrane electrical building and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents, excluding procurement costs for the membrane filtration system equipment as described under Items 6 and 7.	\$	10,285,608.00	\$	10,285,608.00	\$	24,476,598.00	\$	24,476,598.00				
			d. Chlorine Contact Basin. Construct new chlorine contact basin No. 1 and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents.	\$	3,055,727.00	\$	3,055,727.00	\$	4,473,753.00	\$	4,473,753.00				
		LS	 Existing High Service Pump Station. Construct existing high service pump station piping improvements complete in place as shown in Contract Documents. 	\$	2,144,548.00	\$	2,144,548.00	\$	1,998,440.00	\$	1,998,440.00				
4	1		f. High Service Pump Station No. 2. Construct new high service pump station No. 2 including 2 new vertical turbine pumps, building, and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents.	\$	6,848,436.00	\$	6,848,436.00	\$	5,111,170.00	\$	5,111,170.00				
			g. Chemical Facilities. Construct new chemical storage and feed facilities including aluminum chlorohydrate (ACH), liquid ammonium sulfate (LAS), and Sodium Hypochlorite (SH) bulk storage and chemical metering systems, chemical containment area, and the chemical feed facility building and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents.	\$	5,906,436.00	s	5,906,436.00	\$	7,731,720.00	\$	7,731,720.00				
							h. Solids Handling. Construct two (2) new 75-ft diameter gravity sludge thickeners, new 70-ft diameter backwash waste clarifier, new raw sludge pump station, new thickened sludge pump station with two (2) progressing cavity pumps to pump thickened sludge to an offsite forcemain, new recycle pump station with two (2) submersible centrifugal pumps to pump recycle water to the head of the plant, new sludge electrical building, and associated process mechanical equipment and piping, structural, plumbing, electrical, and instrumentation and control work complete in place as shown in Contract Documents.	\$	10,179,437.00	s	10,179,437.00	\$	14,368,150.00	\$	14,368,150.00
			i. Yard piping modifications and improvements as shown on the Drawings.	\$	7,806,420.00	\$	7,806,420.00	\$	18,413,803.00	\$	18,413,803.00				
			j. Miscellaneous site electrical improvements, Modification to Oncor Service, backup power generator, Electrical Distribution Equipment, and SCADA improvements described in the Contract Documents and as shown on the Drawings, excluding procurement costs for the electrical distribution equipment as described under Items 8 through 11.	\$	8,127,724.00	s	8,127,724.00	\$	16,844,000.00	\$	16,844,000.00				
			k. Miscellaneous site civil work, grading, paving, drainage improvements and all other necessary work described in the Contract Documents and as shown on the Drawings.	\$	4,162,675.00	\$	4,162,675.00	\$	2,903,000.00	\$	2,903,000.00				
			Miscellaneous demolition work described in the Contractor Documents and as shown on the Drawings.	\$	100,000.00	\$	100,000.00	\$	91,000.00	\$	91,000.00				
			 m. Enter equipment data of new material provide on this project into the City's asset management system database. 	\$	50,000.00	\$	50,000.00	\$	35,000.00	\$	35,000.00				
5	1	LS	Acceptance Testing for Commissioning and Start up per Specification 01666.	\$	119,523.00	\$	119,523.00	\$	169,000.00	\$	169,000.00				

ATTACHMENT A - BID TABULATION

PFLUGERVILLE WATER TREATMENT PLANT EXPANSION PFLUGERVILLE, TEXAS

A. BASE	E BID PRI	CE								
6	1	LS	Membrane Filtration System Equipment. Membrane filtration system supplier scope as defined in the Membrane Procurement Package. (1)	\$	8,777,750.00	s	8,777,750.00	\$	8,777,750.00	\$ 8,777,750.00
7	1	LS	Membrane Filtration System Equipment including new gate valves and new backwash tank and associated improvements.	\$	979,290.00	s	979,290.00	\$	979,290.00	\$ 979,290.00
8	1	LS	Pad-Mounted Transformers TX-1B, TX-3B, TX-4, TX-6A, TX-6B, TX-8A, TX-8B. Equipment supplier scope as defined in the Electrical Distribution Equipment Pre-Purchase Package. (1)	\$	513,400.00	s	513,400.00	\$	513,400.00	\$ 513,400.00
9	1	LS	Switchboard SWBD-3. Equipment supplier scope as defined in the Electrical Distribution Equipment Pre-Purchase Package. (1)	\$	209,400.00	s	209,400.00	\$	209,400.00	\$ 209,400.00
10	1	LS	480V Motor Control MCC-2A, MCC-3, MCC-5, MCC-6, and MCC-7. Equipment supplier scope as defined in the Electrical Distribution Equipment Pre-Purchase Package. (1)	\$	878,800.00	s	878,800.00	\$	878,800.00	\$ 878,800.00
11	1	LS	Stand-alone VFD's as shown on the Drawings and listed in Attachment C of Section 01010. Equipment supplier scope as defined in the Electrical Distribution Equipment Pre-Purchase Package. (1)	\$	1,108,600.00	s	1,108,600.00	\$	1,108,600.00	\$ 1,108,600.00
12	1	LS	Lake Raw Water Pump Equipment. Equipment supplier scope as defined on the Drawings and in Section 11214 of the Contract Specifications. ⁽²⁾	\$	442,880.00	s	442,880.00	\$	442,880.00	\$ 442,880.00
	Subtotal Before Contingency \$ 103,921,928.00							\$ 146,669,566.00		
13	1		Owner held contingency ⁽³⁾	\$	2,200,000.00	\$	2,200,000.00	\$	2,200,000.00	\$ 2,200,000.00
Total Lump Sum Base Bid Prices S 106,121,928.00						\$ 148,869,566.00				
	Best and Final Cost Savings Accepted that are Proposed by PLW						\$ (5,873,174.00)			
	Membrane Basin Recoating Moved to B. Cash Allowance Items						\$ (142,975.00)			
A. Total	a. Total Lump Sum Negotiated Base Bid Prices								\$ 142,853,417.00	

- Notes:

 (1) The purchase order from the Membrane Procurement package and Electrical Distribution Equipment Pre-purchase package listed above shall be transferred to the selected contractor.

 (2) Equipment price pre-negotiated.

 (3) The owner-held contingency is for the uses by the Owner in its sole discretion. If directed by the Owner, Contractor shall provide necessary documentation for owner-directed uses per section 15-Pflugerville CIP General Conditions.

ATTACHMENT A - BID TABULATION

PFLUGERVILLE WATER TREATMENT PLANT EXPANSION PFLUGERVILLE, TEXAS

B. CASH ALLOWANCE									
					Enginee	r OPCC	PLW		
Bid Item No.	Quantity	Unit	Bid Item Description	ì	Unit Price Bid Numbers	Bid Amount	Unit Price Bid Numbers	Bid Amount	
1	1	LS	Allowance for purchase of raw water from the City for use during the commissioning and start-up acceptance testing as specified in Sections 01535 and 01666. $^{(1)}$	\$	389,000.00	\$ 389,000.00	\$ 389,000.00	\$ 389,000.00	
2	1	LS	Allowance for purchase of plant potable water for use in hydrostatic, field, and functional testing, as specified in Sections 01480, 01535, 01665 and individual equipment specifications. (2)	\$	67,000.00	\$ 67,000.00	\$ 67,000.00	\$ 67,000.00	
3	1	LS	Allowance for additional electrical services to be paid to Oncor Electric.	\$	175,000.00	\$ 175,000.00	\$ 175,000.00	\$ 175,000.00	
4	1	LS	Allowance for Membrane Basin Recoating	\$	142,975.00	\$ 142,975.00	\$ 142,975.00	\$ 142,975.00	
5	1	LS	Allowance for replacing trees removed for construction and planting new trees and shrubs per the quantity as shown on Drawing C-2. (3)	\$	=	\$ -	\$ 115,000.00	\$ 115,000.00	
6	1	LS	Allowance for replacing the north and west fences with new precast concrete fences per work limits shown on the Drawings. ⁽³⁾	\$	=	s -	\$ 392,000.00	\$ 392,000.00	
7	1	LS	Allowance for replacing the south and east fences with new precast concrete fences in addition to base-bid item. $^{(3)}$	\$	=	s -	\$ 404,000.00	\$ 404,000.00	
B. Total	Cash Allo	wance			•	\$ 773,975.00		\$ 1,684,975.00	

Notes

- (1) Allowance for purchase of raw water from the City for use in commissioning and start-up testing. This allowance includes a total of 816,200,000 gallons of raw water purchased at a rate of \$155 per acre-ft. The volume includes seven sessions as defined in Section 01666 plus a 10% contingency.
- (2) Allowance for purchase of plant finished water for use in hydrostatic, field testing, and functional testing, as well as disinfection, as specified in 01480, 01535, 01665 and other individual equipment specifications. This allowance includes a total of 6,620,000 gallons of finished water purchased at a rate of \$10 per 1,000 gallons (use for construction bulk water per City Ordinance No. 1463-20-10-13, Section 1.C of Exhibit B). The (2) volume includes the volume of pretreatment basins, membrane basins, membrane CIP tank, membrane neutralization tank, membrane drain/backwash waste pump station, chlorine contact basin, raw sludge pump station, raw sludge thickeners, backwash waste clarifier, recycle pump station, chemical bulk storage tanks, plus a 30% contingency for piping.
- (3) Scope modifications post 100% OPCC.

TOTAL BASE BID PRICE (A+B) \$ 106,895,903.00 \$144,538,392.00

C. ADD	C. ADDITIVE ALTERNATE BID PRICES							
				Enginee	er OPCC	PLW		
Bid Item No.	Quantity	Unit	Bid Item Description	Unit Price Bid Numbers	Bid Amount	Unit Price Bid Numbers	Bid Amount	
1	1	LS	Additive price for installing site security system and building access control as shown on the Drawings and specified herein. (1)	\$ -	\$ -	\$ 139,000.00	\$ 139,000.00	
2	1	LS	Additive price for routing 8-inch membrane chemical cleaning waste flows, 4-inch sanitary sewer from the existing lift station, and 6-inch thickened sludge from the new thickened sludge pump station to an onsite new manhole as shown on CP-5A in lieu of base bid to connect above lines and discharge to existing 24" force main as shown on CP-5. Fill in with a negative number if the alternate is a deductive item.	\$ -	\$ -	\$ 297,000.00	\$ 297,000.00	
3	1	LS	Additive price for new 6-inch thickened sludge road crossing to connect to proposed manhole has shown on CP-5A.	\$ -	\$ -	\$ 29,857.00	\$ 29,857.00	
4	1	LS	Additive price for construction of the alternate grading/outfall configuration design as shown on C-29 in lieu of base-bid work as shown on C-17.	s -	s -	\$ 31,000.00	\$ 31,000.00	
5	1		Additive price for membrane component system pumps (CIP pumps and neutralization pumps) to discharge to a new onsite manhole as shown on CP-5A in lieu of discharging to the 24" force main as shown on CP-5. Fill in with a negative number if the alternate is a deductive item.	s -	s -	\$ (62,390.00)	\$ (62,390.00)	
6	1	LS	Membrane Filtration System Equipment. Miscellaneous upgrades to pumps, valves, and tanks provided by Membrane filtration system supplier. (2)	\$ -	s -	\$ 1,283,823.52	\$ 1,283,823.52	
C. Tota	l Additive A	Alternat	e Bid Prices		\$ -		\$ 1,718,290.52	

Notes

- (1) Scope modifications post 100% OPCC.
- (2) Item details and cost breakdown will be provided after Contract is awarded. The Owner reserves the right to negotiate with Membrane Filtration System Supplier. See Attachment C.

TOTAL PRICE (A+B+C) \$146,256,682.52

Attachment B - Cost Savings Summary



Item	Description	Accepted Savings	Accepted Additive Alternates	Bid Items Moved to Allowance
1.a	Increase Phase I duration by 100 days	\$1,000,000		
1.b	Increase Phase I duration by an additional 80 days	\$750,000		
1.c	Issue Notice of Intent to Award by 11/11/22 and NTP by 1/11/23	\$250,000		
2	Off-site Laydown Area	\$350,000		
3	Move Chem Building to the North			
	Delete the installation of the temp 36" RW	\$476,435		
	Delete installation of 6"-TS-DIP	\$207,155		
	Delete demo of exist. 6" SL on CPD-2	\$35,986		
	Delete demo of exist. 6" SL on CPD-4	\$7,198		
	Delete demo of exist. 6" SL on CPD-5	\$1,811		
	New 6"-TS Road Crossing to MH on CP-5A		(\$29,857)	
	New 6"-TS Connection from Existing 6" SL	(\$18,744)		
	Delete demo of 1.5" PAC on CPD-2	\$6,419		
	Delete demo of 1.5" CLS on CPD-2	\$6,421		
	Delete demo of 1.5" ACH on CPD-2	\$6,417		
4	Membrane Basin Recoating moved to cash allowance items			\$142,975
5	Potential piping savings			
	a) Concrete encasement in lieu of steel casing pipe	\$583,470		
	b) DIP to steel pipe at membrane strainers.	\$175,350		
6.a	Equipment: Deferment of pretreatment basin covers.	\$612,000		
6.b	Equipment: PLW Install of Prepurchased Covers	\$150,000		
7	Remove LKPS and HSPS Pump Disconnects	\$3,100		
8	Eliminate neutralization tank screening wall	\$76,000		
9	BFVs in lieu of GVs at strainers (Memcor)	\$715,656		
10	Use HDPE for LAS bulk tank lieu of FRP.	\$5,000		
11	Eliminate submersible PS jib cranes.	\$92,200		
12	Defer paving south of future thickeners/clarifiers.	\$150,000		
13	Reduce spare conduits in ductbank.	\$63,500		
14	Optimize number of electrical manholes & ductbank trenches.	\$16,500		
15	Optimize site lighting (current design per City standards)	\$3,400		

Attachment B - Cost Savings Summary



Item	Description	Accepted Savings	Accepted Additive Alternates	Bid Items Moved to Allowance
16	Size ground & neutral conductors per NEC in lieu of full sized ground & neutral.	\$65,400		
17	Utilize the standard aluminum weatherproof covers in lieu of 316SS.	\$18,500		
18	Remove concrete duct bank markers.	\$14,000		
19	Reduce duct bank concrete envelope from 6" to 3" on either side where duct bank is not in roadway or crossing roads. Combine parallel ductbanks to single common ductbank.	\$25,000		
20	Utilize copper clad ground rod in lieu of SS ground rod.	\$25,000		
	Total of Accepted Cost Saving Items		\$5,873,174	
	Total of Accepted Additive Alternates		(\$29,857)	
	Total Net Savings		\$5,843,317	

Attachment C - Membrane Additive Cost Breakdown



Item	Description	Cost
1	Check Valves: Additive price to upgrade the CIP and Neutralizations system check valves to stainless-steel with AIS compliance.	\$122,000
2	CIP Tank: Additive price for larger construct on site CIP tank. As design evolved, a larger CIP tank was needed. Site space constrains required that the larger tank had to be built on site.	\$356,000
3	CIP Tank Immersion Heater Panel Upgrade: Additive price for second CIP tank heater with control panel and including the heater starters in the control panels. With the increased volume of the CIP tank as described in Item 2, a second CIP tank heater was required. As design evolved, the heater panel starters were also shifted from the general contractor's scope to the membrane filtration system supplier's scope.	\$75,000
4	Neutralization Tank: Additive price for larger neutralization tank. As design evolved, a larger neutralization tank was needed. The overall increase in size of the neutralization tank was mitigated by the MFSS altering their neutralization sequence to include in-line neutralization of rinse water in lieu of in-tank neutralization.	\$51,120
5	Static Mixer: Additive price for including a new static mixer to aid in the in-line neutralization process as described in Item 4.	\$31,062
	Neutralization Pumps: Additive price for neutralization pump with increased HP and NSF compliant. With the increase in the height of the neutralization tank, a new neutralization pump selection was required with an upsized motor.	\$42,264
7	CIP Pumps: Additive price for upgrading the CIP pumps to accommodate the additional head added by the in-line neutralization static mixer, additional piping headloss based on design evolution and refinement and meeting the required NPSH conditions with NSF compliance.	\$247,390
8	Permeate Pumps: Additive price for larger permeate pumps with lower speed motors. Permeate pump discharge head and net positive suction head (NPSH) conditions evolved with design after the procurement.	\$245,888
9	Backwash Tank Manway: Additive price for including an additional manway on the new backwash tank to conform with all other tanks within the project.	\$16,700
10	Miscellaneous Electrical: Additive price for miscellaneous electrical components incorporated as a result of design evolution including a dedicated remote panel for the system control HMI, increase in size of HMI screen, custom sized cell RIO panels due to site space constraints and relocating UPS to the membrane master PLC.	\$96,399
	Total Membrane Filtration System Additive Cost	\$1,283,823.52

Note:

^{1.} The above items reflect scope modifications and resultant additive prices between the membrane filtration system procurement (at the 60% design milestone) in December 2021 and the final project bid in September 2022, as the membrane system design has evolved to accommodate certain project requirements. These prices were included at the time of project bid in Table C of the Bid Schedule as a single line item with a fixed price of \$1,283,823.52.