

Table 1. Comparison of Competitively Bid Estimates for 2020 Rule Developed by Santee Cooper vs. Estimates Developed by EPA in Support of the 2020 Rule.

	Santee Cooper Estimate [†] : Preferred Phys/Chem and Biological Vendor A	EPA Estimate*: Phys/Chem and Biological Estimate (Regulatory Option A)	Santee Cooper Estimate [†] : Preferred Membrane/Spray Dryer Vendor D	EPA Estimate*: Membrane Treatment Estimate (Regulatory Option C)
Capital Cross Generating Station	\$138,300,000	\$5,971,518	\$298,000,000	\$14,579,112
Annual O&M Cross Generating Station	\$5,199,021	\$448,708	\$10,500,000	\$1,415,785

[†] Details on Santee Cooper cost estimates contained in Table 2.

* Technical development document (TDD) costs here are the sum of the unit costs for regulatory options A (Table 4) and C (Table 6) at Cross Generating Station, as provided by ERG in their August 31, 2020 memo in support of the 2020 rulemaking.

Table 2. Summary of Net Present Value - Santee Cooper/Stantec Estimates of Total Costs.

	900 gpm Design Rate/900 gpm O&M Rate All Units in Service				Sensitivity Analysis: 750 gpm Design/O&M Rate		Sensitivity Analysis: 650 gpm Design/O&M Rate	
Technology	Preferred Phys/Chem and Biological Vendor A	Phys/Chem and Biological Vendor B	Phys/Chem and Biological Vendor C	Preferred Membrane/Spray Dryer Vendor D	Preferred Phys/Chem Vendor A	Preferred Membrane/Spray Dryer Vendor D	Preferred Phys/Chem Vendor A	Preferred Membrane/Spray Dryer Vendor D
Total Installed Cost	\$138,300,000	\$140,000,000	\$156,000,000	\$298,000,000	\$117,600,000	\$267,200,000	\$107,900,000	\$245,200,000
Vendor Equipment (including Santee Cooper-assigned risk costs)	\$54,742,247	\$56,335,334	\$59,437,549	\$85,196,100	\$49,069,753	\$76,367,921	\$45,032,403	\$70,084,539
Uncertainty of Estimate (10%)	\$12,566,060	\$12,566,060	\$14,178,454	Included in Factored TIC	\$4,906,975	Included in Factored TIC	\$4,503,240	Included in Factored TIC
Design, Installation, Startup, and Oversight	\$70,918,355	\$70,918,355	\$82,346,991	\$212,800,000	\$63,569,662	\$190,749,266	\$58,339,293	\$175,054,844
Operations & Maintenance (\$/yr)	\$5,199,021	\$5,214,952	\$5,245,974	\$10,500,000	\$4,559,226	\$9,000,000	\$4,130,139	\$8,000,000
Operator Labor (\$/yr)	\$1,153,177	\$1,153,177	\$1,153,177	\$1,153,177	\$1,153,177	\$1,153,177	\$1,153,177	\$1,153,177
Power Consumption (\$/yr)	\$156,366	\$156,366	\$156,366	\$4,321,852	\$130,305	\$3,601,544	\$112,931	\$3,121,338
Chemical Demand (\$/yr)	\$1,739,326	\$1,739,326	\$1,739,326	\$1,493,363	\$1,449,438	\$1,244,469	\$1,256,180	\$1,078,540
Maintenance (\$/yr)	\$547,422	\$563,353	\$594,375	\$851,961	\$490,698	\$763,679	\$450,324	\$700,845
Fly Ash Loss (\$/yr)	\$0	\$0	\$0	\$263,328	\$0	\$219,440	\$0	\$190,181
Byproduct Landfill (\$/yr)	\$1,602,730	\$1,602,730	\$1,602,730	\$2,394,278	\$1,335,608	\$1,995,231	\$1,157,527	\$1,729,201
Life Cycle Analysis					Life Cycle Analysis			
Present Day	\$138,300,000	\$140,000,000	\$156,000,000	\$298,000,000	\$117,600,000	\$267,200,000	\$107,900,000	\$245,200,000
Year 7 (2028)	\$140,800,000	\$142,400,000	\$157,200,000	\$250,000,000	\$120,900,000	\$224,200,000	\$111,300,000	\$205,700,000
Year 15 (2036)	\$168,500,000	\$170,200,000	\$185,100,000	\$306,000,000	\$146,800,000	\$272,000,000	\$136,000,000	\$248,200,000
Year 30 (2051)	\$202,100,000	\$203,800,000	\$218,700,000	\$373,400,000	\$178,100,000	\$329,700,000	\$165,900,000	\$299,600,000

Notes:

1. Life cycle analysis pricing includes labor and commodities not adjusted for inflation, but future dollars were normalized to today's dollars using a discount rate.
2. This is a Santee Cooper workproduct. While based upon bids received, none of the provided costs come from the bids themselves, which are covered under a non-disclosure agreement. Instead, these figures include additional estimates of construction cost and risk.

Table 3. O&M Estimate of Brine Stabilization without Downstream Evaporation System - Standalone - Does Not Include O&M of Upstream Phys/Chem or RO System. Revised with updated costs on 10/3/2022.

Case	Design Case	Alternative Scenarios provided by RO Vendor based on System Operation							
Wastewater Flow (gal/min)	900	900	900	750	750	600	600	450 - Avg Case	300
TDS (mg/l)	65,000	28,602	49,430	33,788	55,646	40,357	63,858	49,430	63,858
Vendor-Estimated Recovery (%)	67.4	89.4	78.9	87.3	74.7	84.2	68.3	78.9	68.3
Brine Flow (gal/min)	293.5	95.0	190.0	95.0	190.0	95.0	190.0	95.0	95.0
Time averaged load based on historical unit capacity and operating hours (MW)	869	869	869	869	869	869	869	869	869
Brine S.G. (Estimate)	1.35	1.16	1.27	1.19	1.30	1.23	1.34	1.27	1.34
Brine (lb/hr)	198,078	55,209	120,824	56,534	123,815	58,184	127,694	60,412	63,847
Total Ash (lb/hr)	339,562	94,644	207,127	96,916	212,255	99,744	218,905	103,564	109,452
Cross Fly Ash (lb/hr)	136,026	94,644	136,026	96,916	136,026	99,744	136,026	103,564	109,452
Outside Fly Ash (lb/hr)	203,536	0	71,101	0	76,229	0	82,879	0	0
Lime or Cement (lb/hr)	28,297	7,887	17,261	8,076	17,688	8,312	18,242	8,630	9,121
Landfill (lb/hr)	565,937	157,740	345,212	161,526	353,758	166,239	364,841	172,606	182,421
Loss in Ash Sales (\$/yr)	\$ 4,194,389	\$ 2,918,367	\$ 4,194,389	\$ 2,988,424	\$ 4,194,389	\$ 3,075,626	\$ 4,194,389	\$ 3,193,417	\$ 3,374,974
Additional Ash Purchsed (\$/yr)	\$ 89,148,768	\$ -	\$ 31,142,238	\$ -	\$ 33,388,302	\$ -	\$ 36,301,002	\$ -	\$ -
Cement or Lime Purchased (\$/yr)	\$ 16,360,194	\$ 4,559,948	\$ 9,979,620	\$ 4,669,220	\$ 10,226,494	\$ 4,805,666	\$ 10,546,795	\$ 4,989,521	\$ 5,273,397
Landfill Cost (\$/yr)	\$ 36,364,056	\$ 10,135,521	\$ 22,181,459	\$ 10,378,789	\$ 22,730,579	\$ 10,681,620	\$ 23,442,713	\$ 11,090,729	\$ 11,721,388
Brine Stabilization O&M (\$/yr)	\$ 146,067,406	\$ 17,613,835	\$ 67,497,706	\$ 18,036,433	\$ 70,539,764	\$ 18,562,913	\$ 74,484,898	\$ 19,273,667	\$ 20,369,760

Assumptions:		
O&M does not include power, PM, and labor associated with a brine stabilization system		
Lime and ash required for stabilization is dependent on the specific properties of the water including TDS, pilot testing required to determine RO performance and material quantity and feasibility to stabilize brine for landfill		
Cross Station Fly Ash Sale Average	\$	7.04 per ton
Cost to Puchase Fly Ash	\$	100.00 per ton
Cost to Puchase Lime or Cement	\$	132.00 per ton
Cross Station Landfill Cost	\$	14.67 per ton