Cost of Service Rate Study

Board of Directors Workshop #3 Capacity Charge Analysis

August 1, 2018





Capacity charges are one of the two primary sources of NapaSan user revenue

Capacity Charge (Today's Discussion)

- One-time fee
 - New connections
 - Change in connection classification
 - Increase in industrial capacity usage
- Pays for capacity reservation
- Funds capital only
 - Used to either fund new system capacity or buy equity in the existing system

Sewer Service Charges

- Semi-annual charge for all residents and businesses
- Pays for collection and treatment operations and maintenance
- Funds O&M and some capital
 - O&M covers salaries, chemicals, etc.
 - Capital covers repair and replacement

NapaSan's current capacity charge is based on a buy-in approach for the system as a whole

2009 Study calculated system value and capacity as:

 Capacity charge has been adjusted annually using inflation index

RCNLD	\$283.7m	Date Effective	Capacity Charge
Plus: Capital Fund Reserves	\$7.5m	July 1, 2014	\$8,723
Plus: Interest Expense	\$13.9m	July 1, 2015	\$8,950
Less: Existing Debt	\$(38.4m)	July 1, 2016	\$8,950
Net System Valuation	\$266.7m	July 1, 2017	\$9,299
Capacity (EDUs)	33,763	July 1, 2018	\$9,624
Capacity Charge (\$ / EDU)	\$7,900		



There are three options available when calculating capacity charges

Buy-in

- New connections buy existing capacity that has been paid for
- Best for mature systems

Incremental/Expansion

- New connections pay for expansion CIP
- CIP can be allocated between new and existing users
- Best for systems with lots of growth planned

Hybrid

- Combines both the buy-in and expansion approaches
- Best for systems inbetween build-out and growth phases

How are the two primary methodologies implemented?



- 1. Calculate fixed asset value
- 2. Add in reserves, and deduct outstanding debt principal and donated assets
- 3. Divide by current capacity in EDUs
- 4. Escalate to keep pace with inflation

- 1. Allocate CIP between existing system and expansion
- 2. Divide by projected number of EDUs to be served by expansion
- 3. Escalate to keep pace with inflation

Our analysis separates the treatment plant and collection systems

- Each system has evolved differently since 2009
 - Reclaimed Water has taken a larger role at WWTP
- Each system has distinct capacity limitations
 - Collection system: 66-inch trunk line during peak wet weather
 - WWTP: aeration basin hydraulic capacity



Buy-In Approach

The capacity for each system is defined by the limiting system component

	WWTP EDUs	Collection EDUs
Used Capacity	37,238	40,476
Unused Capacity	3,238	-
Total Capacity	40,476	40,476

• WWTP

- Aeration basin summer influent capacity (8.5 mgd capacity)
 - 7.8 mgd max dry weather flow ÷ 210 gpd / EDU = 37,238 EDUs
- Collection
 - 66-inch trunk line
 - At capacity during peak wet weather flows
 - EDUs equals WWTP total capacity

Fixed asset values form the basis for developing the system valuation

• Two valuation methodologies were considered, in keeping with WEF's *Financing & Charges for Wastewater Systems, Manual of Practice 27*

Replacement Cost New, Less Depreciation (RCNLD)

- Accumulated depreciation is deducted from the original cost for all assets
- Adjusted value is escalated to present day dollars

Replacement Cost New (RCN)

- Original cost is escalated to present day dollars
- No depreciation is deducted

Several other key assumptions were added to this analysis to better reflect NapaSan's assets

Handy-Whitman Index was used for cost escalation of non-land assets

Land assets were escalated using a real estate-specific index

Donated assets were not included in the total system value

All non-land assets were assigned an appropriate residual value



The two asset valuation approaches result in differing capacity charges

	RCN		R	CNLD	
	WWTP	Collection		WWTP	Collection
Capital Assets	\$440.5m	\$329.6m	Capital Assets	297.0m	\$179.7m
Less: Adjustments	\$(71.0m)	\$(179.1m)	Less: Adjustments	\$(33.0m)	\$(71.3m)
Total	\$369.6m	\$150.5m	Total	\$264.0m	\$108.3m
\$ / EDU	\$9,130	\$3,719	\$ / EDU	\$6,522	\$2,675
Combined \$ / EDU	\$12	,850	Combined \$ / EDU	\$9,	199

Filename.ppt/11

Adjustments include deduction of donated assets and remaining principal on debt, and addition of reserves and interest paid on debt service

Expansion Approach

Our expansion approach analysis looked at the 10-year CIP for projects that increase collection and treatment capacity

Collection System - \$28m expansion CIP

- 72-inch trunk line upgrade to add 12 mgd of capacity
- Browns Valley trunk line (portion not funded by current users)

Wastewater Treatment Plant - \$25m expansion CIP

- The following projects will increase capacity by 10,000 EDUs:
 - Aeration basin expansion (flow capacity)
 - Second digester (solids handling capacity)

The expansion approach is less impacted by the RCN/RCNLD decision than the buy-in approach

RCN		RCNLD			
	WWTP	Collection		WWTP	Collection
Capital Projects	\$24.5m	\$28.2m	Capital Projects	\$24.5m	\$28.2m
Unused System	\$29.6m	-	Unused System	\$21.1m	-
Total	\$54.1m	\$28.2m	Total	\$45.6m	\$28.2m
\$ / EDU	\$4,084	\$2,906	\$ / EDU	\$3,446	\$2,906
Combined \$ / EDU	\$6,	990	Combined \$ / EDU	\$6,	352

Hybrid Approach

The hybrid approach adds the current and future system values, and divides by current and future system capacities

Canacity		Value of Existing Assets + Value of Capital Projects
Charge	Capacity Charge = -	Current System Capacity (EDUs) + Future Planned Capacity

- Recognizes that wastewater utilities can be in-between buildout and growth phases
 - Useful for agencies with significant assets, but also with substantial capacity expansion planned



The hybrid approach reflects a weighted average of the expansion approach and the buy-in approach

Replacement Cost New

Replacement Cost New, Less Depreciation

	WWTP	Collection
Existing System Value + Capital Projects	\$394.1m	\$178.8m
Current + Planned Capacity (EDUs)	50,476	50,190
\$ / EDU	\$7,807	\$3,562
Combined \$ / EDU	\$11,369	

	WWTP	Collection	
Existing System Value + Capital Projects	\$288.5m	\$136.6m	
Current + Planned Capacity (EDUs)	50,476	50,190	
\$ / EDU	\$5,715	\$2,721	
Combined \$ / EDU	J \$8,437		

Recommendations

The RCNLD buy-in approach is recommended

- The buy-in approach best reflects NapaSan's current and future system capacity needs
- RCNLD is recommended based on age of the system, and consistency with previous analysis
- Changing the approach could result in revenue impacts, or increases to the Sewer Service Charge
 - SSC approved for 6% increase this year

Approach	RCN	RCNLD	Approach
Buy-In	\$12,850	\$9,199	Buy-In
Expansion	\$6,990	\$6,352	Expansion
Hybrid	\$11,369	\$8,437	Hybrid

Approach	RCN	RCNLD
Buy-In	\$662 (-2%)	\$676 (no change)
Expansion	\$686 (+1%)	\$689 (+2%)
Hybrid	\$668 (-1%)	\$680 (+1%)

NapaSan currently uses San Francisco ENR for escalation, but US average ENR is recommended to smooth fluctuations

ENR-CCI SF vs. 20-City Average, 2008 to 2018

