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TECHNICAL MEMORANDUM

TRI GID

PROCESS WATER RATE STUDY

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Subject:	Proposed TMWRF Commodity Rate

1.0   BACKGROUND

The TRI GID contracted with Farr West Engineering in January 2022 to conduct a utility rate study for the water, sewer, and process utilities through fiscal year ending in 2027 (FY 27). As part of the analysis for the proposed process utility, it is understood that the GID will need to purchase effluent from TMWRF on a volumetric basis (i.e., per kgal).

The intent of this memorandum is to document the assumptions and methodology used to determine a representative and appropriate unit rate to recover the costs incurred by the City of Sparks and the City of Reno related to pumping effluent into the TRI GID process system.

1.1   ASSUMPTIONS AND METHODOLOGY

Key assumptions used to calculate unit cost of service for pumping effluent include:

Item	Value
Estimated Volume of Water Pumped	500 acre-feet
Power per Pump	400 hp
Number of Pumps	4
Flow Rate per Pump	2,027 – 2,250[1]
Unit Cost of Electricity	$0.14 per kWh
Operator Labor Required	6.5 hours per week
Annual Cost of Full Time Employee (FTE)	$100,000 (salary + benefits)
Installation Cost of TMWRF Specific Facilities	$4,600,000
Service Life of Pumping Facility	40 years

1 – With a single pump on the facility operates at flow rate of 2,250 gpm. When all four pumps are pumping in parallel the flow rate per pump is reduced to 2,027 gpm for a total flow of 8,108 gpm.

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This analysis uses three specific sources of cost recovery for the TMWRF facility. These sources are:

- Electricity
- Labor
- Depreciation

Electricity

TMWRF will incur electrical costs to pump effluent into the TRI GID system which are directly correlated to the total power consumption of the facility. The total power consumption of the facility is a function of the size of motors on each pump, the number of pumps in operation, and the total time each pump is in operation.

$$Cost_{electricity} = 0.7457 \times n_{pumps} \times P_{per\ pump} \times t_{operation} \times \$_{kWh}$$

$n_{pumps} = 4$

$P_{per\ pump} = 400$ hp

$t_{operation} = 335$ hours (for 500 acre-feet)

$\$_{kWh} = \$0.14$ per kWh

The total cost of electricity to pump 500 acre-feet of effluent was found to be \$55,942. This cost is directly proportional to the total volume pumped so it can simply be scaled up or down by dividing the total volume pumped by 500 acre-feet if actual volumes differ from the projected volume.

Labor

The cost of labor associated with the operation of the facility is slightly more difficult to estimate than electrical costs because the facility was designed to operate with minimal operational oversight and there is no history of operations to base values on. The operation & maintenance activities considered in estimating the labor total were as follows:

- Daily inspection (0.5 hr per day)
- Operational log review (1 hr per week)
- Routine maintenance (1 day per month)

The time allotted to these routine activities equate to 6.5 hours per week or 16.3 percent of a FTE. Using the estimated cost of an FTE stated previously, the total labor cost becomes:

$$0.16 \times \$100,000 = \$16,250$$

Depreciation

It is common for utility rates to include a charge to replace equipment after it has reached the end of its useful life. The calculation for this charge uses straight-line depreciation to estimate the annual recovery cost for the utility to use to replace the facility and/or equipment. The annual depreciation cost component was calculated as follows:

$$Installation\ cost\ of\ facility = \$4,600,000$$

$$Service\ Life\ of\ Facility = 40\ years$$

$$Annual\ Depreciation = \frac{\$4,600,000}{40} = \$115,000$$

2.0   ANNUAL CHARGE AND UNIT COST

Combining the electricity, labor, and depreciation costs the estimated annual fee of $187,192 is required for 500 acre-feet of effluent. Farr West recommends two options for how this fee can be assessed to the TRI GID on an annual basis.

Option 1 - This fee could be reduced to a single volumetric charge of $1.15 per kgal of water pumped, or

Option 2 - The fee could be split into a base fee of $131,250 (depreciation + labor fixed costs) plus a volumetric charge of $0.34 per kgal for the electricity charges.

The benefit of Option 1 is that it is the most simplistic by charging a single fee based on gallons of water pumped. However, this unit rate could result in insufficient cost recovery if less than 500 acre-feet are provided in any one year, and/or excessive cost recovery if more than 500 acre-feet are delivered to the TRI GID. Option 2 ensures that TMWRF's fixed costs are recovered annually and collects the correct total for electricity costs no matter the volume of effluent provided.

Ultimately, the City of Reno, City of Sparks, and the TRI GID should commit to revisiting this unit rate within 3 years of operations (e.g., by 2025) in order to update any estimated costs with actual expense records. The fees detailed in this memorandum also do not constitute the full expense of operating the process water utility or include all fees which the GID needs to pay other entities on an annual basis. For example, TMWA assesses the GID an Operations & Resource Fee of $47 per acre-foot of effluent and is entitled to collecting legal fees associated with providing up to 4,000 acre-feet of effluent to the TRI GID.

TMWRF Unit Rate Calc

Total Water Delivered	500	ac-ft
Flow Rate Total	8108	gpm
Number of Pumps	4	
HP per Pump	400	

Hours of Pump Operation	335	hours
Unit Cost of Electricity	$0.14	$/kWh
Cost of Electricity	$55,941.77	

Number of hours per week	6.5	
FTE Ratio	0.1625	
FTE Salary + Benefits	$ 100,000	
Operator Cost	$ 16,250	

Installation Cost of TMWRF Equipment	$ 4,600,000	
Service Life of Facility	40	
Annual Depreciation	$ 115,000	

Annual Charge	**$187,191.77**

Commodity Charge	**$1.15**	per kgal

Option 1

Base Charge	**$131,250.00**	
Commodity Charge	**$0.34**	per kgal

Option 2