

Finance Analysis Guidance

Rates & Assumptions

Unless otherwise authorized by the MCES Finance Division, MCES staff and consultants should use the following assumptions and methodologies in all financial analysis and budget development.

Inflation Rates (per year)

Item Expense	Rate
Labor (including benefits):	3.0%
Electricity:	3.0%
Other expenses:	3.0%
Construction (for capital expenses in future years):	3.0% or contract provisions, if available

Discount Rates (per year)

Item Name	Rate
Discount Rate to use in analysis*	3.0%

*This is the average annual cost of capital (net interest cost of bonds and PFA loads) for the past twenty years.

Useful Lives

Asset Name	Service Life
Buildings/Structures	40 years
Gravity Sewers	80 years
Forcemains (dual-pipes, corrosion-resistant materials)	40 years
Process Piping	30 years
Equipment	Varies, 20 years is typical
Mechanical & Electrical Systems	20 years
Instrumentation & Control	15 years
Mobile Equipment	10 years
Computer Hardware and Software	4 years

Replacement Cost Factor

Type	Factor to use before adjusting for inflation*
Non-Mobile equipment	1.25
Mobile equipment	1.00

*This accounts for higher replacement cost due to newer technology, installation, and purchasing equipment separately from the original construction project. Use these factors unless there is compelling reason to use different rates.

Analysis Horizon

Project Type	Analysis Year
Master Plans	50 years
Facility Plans	20 years
Interceptors	50 years
Treatment Plants	20 years
Other Capital Projects	Life of the project's main/major structure
Projects that depend on a specific contract	Contract Term

Terminal Residual Value

Value Description	Value Equation
For assets that are not fully depreciated at the end of the analysis horizon	Maximum Terminal Value = cost less straight-line depreciation to terminal date.
For assets fully depreciated at the end of the analysis horizon	Minimum Terminal Value = scrap value of materials less demolition costs.
For land (if applicable)	Original land purchase price (a conservative estimate)

Rates & Assumptions

For decision-making, such as alternatives analysis, use incremental cost analysis methodology (i.e. recognize all cash flows incremental to the decision over the time horizon of the analysis, including any fixed or indirect expenses). For pricing services, use a full cost approach, and see Council Policy 3-2 or consult MCES Finance for additional guidance.

Capital Costs

Cost Area	As a percent of construction cost
Master/Area Planning – Undeveloped Design Details & Contingencies	50%
Facility Planning – Undeveloped Design Details & Contingencies	30%
Engineering, Administrative, and Legal costs	20%

Operation and Maintenance Prices (including sales tax)

Cost Centers	Cost (in 2022)
Electricity (at Treatment Plants) <i>Note: On-peak hours are 9am-9pm weekdays (35% of total time is on-peak). Contact David Ponder for more detail.</i>	\$0.099/KWH average \$0.138/KWH on-peak \$0.078//KWH off-peak
Natural Gas – Interruptible (use for Metro and Blue Lake stabilization)	\$0.593/therm
Natural Gas – Firm (use for all other facilities) <i>Contact David Ponder for more detail.</i>	\$0.669/therm

Cost Centers	Cost (in 2022)
Diesel Fuel	\$4.50/gallon
Emulsion Polymer	Depends on sludge & process (\$0.93/lb – \$1.32/lb)
Chlorine (bleach) – if under 1,000 gallons	\$2.07/gallon
Chlorine (bleach) – if between 1,000 and 2,500 gallons	\$1.65/gallon
Chlorine (bleach) – if over 2,500 gallons	\$1.44/gallon
Sulfuric Acid – 100 to 1,000 gallon delivery	\$7.25/gallon
Caustic Soda – if under 2,500 gallon delivery	\$2.64/gallon
Caustic Soda – if over 2,500 gallon delivery	\$2.32/gallon
Sodium Bisulfite – if under 2,500 gallon delivery	\$4.25/gallon
Sodium Bisulfite – if over 2,500 gallon delivery	\$1.63/gallon
Aluminum Sulfate	\$1.15/gallon
Ferric Chloride	\$1.31/gallon
Labor Salaries & Benefits – Operations (2022 average, excludes overtime)	\$128,000 (Assumes 2,080 hours paid and 1,800 hours worked per year)
Labor Salaries & Benefits – Maintenance (2022 average, excludes overtime)	\$135,000 (Assumes 2,080 hours paid and 1,800 hours worked per year)

Greenhouse Gases* (valued at \$9 per ton of CO2 equivalent)

Indirect Carbon Costs (Excel Energy)

Fuel Type	Cost by energy unit
Electricity	\$0.0054 per KWH

Direct (on-site) Carbon Costs

Fuel Type	Cost by energy unit
Natural Gas	\$0.054 per therm
Distillate Fuel Oil	\$0.073 per therm
Propane (LPG)	\$0.060 per therm
Gasoline	\$0.092 per gallon

From Exhaust (these costs include climate change multipliers)

Fuel Type	Cost by energy unit
Methane	\$207 per ton
Nitrous Oxide	\$2,790 per ton

*These costs are in addition to the regular cost of these items