



Completed by: Les Major  
 Department Head Review: Anne Beierle

Responsible Department: Public Works  
 Fund: Water #6

Project Name:		<b>Utility Line Replacement - water</b>			
Brief Description:		Replacement and rehabilitation of aging water distribution lines			
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility Safety Issue
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		780,000	811,200	843,648	877,394	912,490	948,989	986,949	1,026,427	1,067,484	1,110,183	9,364,764
On-Going Maintenance												-
<b>Total Project Costs</b>	-	<b>780,000</b>	<b>811,200</b>	<b>843,648</b>	<b>877,394</b>	<b>912,490</b>	<b>948,989</b>	<b>986,949</b>	<b>1,026,427</b>	<b>1,067,484</b>	<b>1,110,183</b>	<b>9,364,764</b>

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Revenue Estimate												-

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Utility Line Replacement - water

The City of Golden owns 110.3 miles of water distribution mains with an expected life span of 75 years. In order to maintain the current system, approximately 1.5 miles of water main should be replaced each year. Since we have slightly over invested in water mains in recent years, the cost estimate has been calculated based on replacing 1.4 miles of water main (90% of the goal) at current contract unit costs. Increased water quality complaints, main breaks and reduced flow are used as indicators for planning replacements. ROW costs associated with cutting newer streets also drive replacement of mains that may not need replacement today but will within the next five to 10 years. A reliable and safe water distribution system is expected by the residents of Golden and this type of project ensures that. This project will not change ongoing maintenance costs for the distribution system overall, but deferred investment would result in increases to maintenance.

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

List any obstacles for implementation

*Finance Use Only*

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Theresa Worsham  
 Department Head Review: Dan Hartman

Responsible Department: Public Works  
 Fund: Water #7

Project Name:		<b>Hydroelectric Power Project</b>			
Brief Description:		A feasibility study completed in 2018 (funded by a State grant) identified one or more hydroelectric projects to be sited at City reservoirs in Clear Creek County that could yield a significant source of renewable energy for the City.			
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
New/Additional Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No New/Additional Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility/ Safety Issue
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs							250,000					250,000
On-Going Maintenance							-	1,000	1,000	1,000	1,000	4,000
<b>Total Project Costs</b>		-	-	-	-	-	250,000	1,000	1,000	1,000	1,000	254,000

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate			-	-	-	-	10,000	10,000	10,000	10,000	10,000	50,000

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Hydroelectric Power Project

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

In order to make progress on the City Council adopted renewable energy goals embodied in Resolutions 1793 and 2330, it will be necessary to pursue the implementation of significant renewable energy projects for city facilities. Council's stated goal is to achieve 50% of electricity from renewable sources. Hydroelectric power could yield a significant source of renewable energy for City operations. The feasibility study included identification of opportunities, economic analysis, conceptual design and permitting. The best opportunities for return on investment are at the Upper & Lower Urad and Guanella Reservoir locations. Preliminary estimates include \$250,000 for a 10kW turbine and associated pipe infrastructure. There may be opportunities for state grant funds to offset a portion of the costs and monthly revenue for the electricity generation.

Revenues are dependent on both the utility offerings at the time of construction and the price paid per kWh of electricity generated. Because this turbine would not offset any COG electricity generation, but would sell energy to the Henderson Mine (nearest electric consumer) through a net metering agreement, the cost offset is minimal for the City. However, the energy produced would directly benefit the City's renewable energy goals and be counted toward the City's investment and progress. Due to financial feasibility determined from the feasibility study we have pushed this project back 5 years, to 2025.

List any obstacles for implementation

The Federal Energy Regulatory Commission (FERC) publishes rules on the process for activities within regulated bodies of water. The process to obtain permits may take longer than the estimated timeline proposed here.

Finance Use Only

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Anne Beierle  
 Department Head Review: Dan Hartman

Responsible Department: PW  
 Fund: Water #8

Project Name:		<b>Guanella Reservoir Reclamation</b>			
Brief Description:		Remove approximately 10,000 cy of saline soils and replace with a capillary barrier, clean fill and topsoils to repair approximately 0.6 acres at Guanella Reservoir that has not adequately revegetated.			
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
New/Additional Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No New/Additional Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility/ Safety Issue
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		200,000										200,000
On-Going Maintenance												-
<b>Total Project Costs</b>		<b>200,000</b>										<b>200,000</b>

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate												-

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Guanelia Reservoir Reclamation

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

Please note, this project was budgeted in 2019 and has been pushed back until 2020. When Guanelia Reservoir was constructed in 2002, Golden excavated in excess of 1,300,000 tons of gravel to increase the capacity of the reservoir. The gravel was stockpiled on adjacent property that had been used as part of the existing sand and gravel operation to be processed and sold. The condemnation case, that established the purchase price of the reservoir, also established the terms for the use and return of the stockpile area to the owners. The gravel stockpile was exhausted in 2015 and the property was reclaimed per the conditions of the state issued reclamation permit and condemnation agreement. The Division of Reclamation, Mining and Safety released the reservoir itself from the reclamation permit in October 2017. They decided not to release the 28 acres where the stockpile had been located because approximately 0.6 acres have not revegetated adequately. Upon investigation, these 0.6 acres have high saline concentrations, possibly due to salt and sand operations at the processing facility. This project excavates 2.5 feet from the impacted acreage, installs a capillary barrier to prevent saline uptake, and backfills the excavation with soil and at least 6 inches of topsoil. This should result in adequate revegetation in these sections and enable the City to get released from the reclamation permit and return the property to the owners.

List any obstacles for implementation

Finance Use Only

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Will Stambaugh  
 Department Head Review: Anne Beierle

Responsible Department: Public Works  
 Fund: Water #9

<b>Project Name:</b>	<b>Vidler Tunnel Improvements</b>				
<b>Brief Description:</b>	Rebuild and Replace infrastructure including; collection points, pipelines, instrumentation, portals, and tunnel				
<b>Funding Source</b>	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
<b>Revenue Generated</b>	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No Revenue Generated	
<b>Legally Mandated</b>	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
<b>Public Health &amp; Safety</b>	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
<b>Operating Budget Impact</b>	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
<b>Environment and Sustainability</b>	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
<b>% Of Population Served</b>	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
<b>Preservation of Facility</b>	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility Safety Issue
<b>Project Useful Life</b>	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
<b>Conformity to Strategic Plans &amp; Department Goals</b>	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
<b>Recreational or Aesthetic Value</b>	Major Value	Moderate value	No Value	Possibly Detrimental	
<b>Estimated Frequency of Use</b>	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		100,000	250,000	450,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,850,000
On-Going Maintenance												-
<b>Total Project Costs</b>	-	100,000	250,000	450,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,850,000

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate												-

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Vidler Tunnel Improvements

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

The Vidler collection system and diversion tunnel allows Golden to divert water from the Colorado River headwaters to Clear Creek for use at Fossil Trace and for other uses that require "Non-tributary" water. It is a vital part of Golden's water infrastructure. It consists of six collection points with six head gates that feed snowmelt into a pipeline. The pipeline is about 5000 feet long and carries the snowmelt across the Horseshoe basin. At the end of the pipeline is a flume that measures and controls the water before feeding it into the West Portal of a tunnel (Vidler Tunnel). The tunnel extends 1.4 miles through a mountain, under the Continental Divide, and discharges the water into the headwaters of Clear Creek several miles above Georgetown. Once the water is in Clear Creek, it becomes available for Golden to use. This project will not change ongoing maintenance costs for the Vidler system overall, but deferred investment would result in increases to maintenance.

- 1.) In 2019 and 2020 we plan to replace the energy dissipater, add a control valve to the collection pipe at a high point between point C and D, and begin stockpiling gravel for future construction projects. We also plan to pre-construct and place on-site key components of the overall west portal rehabilitation. **The scope of work has evolved to use Tunnel Liner Plates instead of steel culverts, the Liner plates will be acquired in 2019 and placed on site along with various other supplies. The actual rehab of the portal is now scheduled for fall of 2020**
- 2.) The existing Energy dissipater was originally installed in 1959 and has been exposed to the elements at 11,800 feet elevation ever since. There is severe corrosion and displacement and a significant amount of water is currently leaking through cracks and corrosion holes in the device. The downstream 36" pipe is also in poor condition and will need to be replaced. **The tunnel liner plates will replace the energy dissipater as well as the 36" downstream pipe.**
- 3.) We should observe less leakage, reduced risk of catastrophic failure, and reduce erosion of the tunnel floor.
- 4) The Vidler tunnel generates revenue by water sales to Coors via the "Wastewater Agreement". The existing revenue stream for water sales will be disrupted if the tunnel or major components of the system fail.

List any obstacles for implementation

Finance Use Only

Date

Received by Finance Department	
Reviewed by City Manager:	



Completed by: Anne Beierle/Theresa Worsham  
 Department Head Review: Dan Hartman

Responsible Department: PW  
 Fund: Water #10

Project Name:	<b>Solar Photovoltaic Projects at Water Treatment Ponds</b>				
Brief Description:	10-500kW of solar photovoltaic panels can generate electricity to meet 100% of the RV park and additional electricity needs for the City.				
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
New/Additional Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No New/Additional Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility/ Safety Issue
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		100,000				1,000,000						1,100,000
On-Going Maintenance												-
<b>Total Project Costs</b>		100,000	-	-	-	1,000,000	-	-	-	-	-	1,100,000

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate			5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	45,000

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Solar Photovoltaic Projects at Water Treatment Ponds

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

Ground-mounted and rooftop solar photovoltaic is the most cost-effective technology for renewable energy generation in Golden. The surface of the water treatment ponds presents an opportunity for newer floating solar technology. A small 10kW system (equivalent to two single family home rooftops) as a pilot project to assess durability over a winter season is a reasonable first step. Pending success and additional data to ensure reliability, a system up to 500kW could be appropriate.

Revenue generated would be dependent on the utility rebates offered at the time of construction. In general, solar rebates are declining, but total costs of equipment are also trending down, resulting in a similar or better payback period as other city solar projects. It is expected that overall monthly consumption (electricity bills) will decrease, offset by any loan payment for construction, and significant reduced costs after the payback period. The total system size would offset the entire electricity usage at the RV Park and some additional from the Water Treatment Plant.

List any obstacles for implementation

If the pilot project does not provide sufficient results to ensure durability or other newly installed projects around the U.S. yield unfavorable results, staff will not want to proceed with additional installations.

Finance Use Only

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Brynn Goe  
 Department Head Review: Anne Beierle

Responsible Department: Public Works  
 Fund: Water #11

Project Name:		<b>Water Quality/Plant Improvements - General</b>			
Brief Description:		Capital replacement of components of the potable water plant to assure reliable operations and ongoing treatment of safe potable water for residents and businesses in the city			
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
New/Additional Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No New/Additional Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility/ Safety Issue No
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
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**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		700,000	1,150,000	800,000	1,030,000	2,000,000	1,000,000	750,000	750,000	750,000	750,000	9,680,000
On-Going Maintenance												-
<b>Total Project Costs</b>	-	<b>700,000</b>	<b>1,150,000</b>	<b>800,000</b>	<b>1,030,000</b>	<b>2,000,000</b>	<b>1,000,000</b>	<b>750,000</b>	<b>750,000</b>	<b>750,000</b>	<b>750,000</b>	<b>9,680,000</b>

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate												-

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Water Quality/Plant Improvements - General

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

Golden's water treatment plant provides safe, clean potable water to residents and businesses in the City of Golden. The water plant starts at the raw water ponds west of the plant and includes several processes, including oxidation, coagulation, flocculation, sedimentation, filtration, disinfection, and solids handling, controlled using state of the art process control. The oldest facilities at the plant date back to the 1950s and the plant has been updated and modified to meet demand and to improve the reliability and quality of water delivered to the system. Capital replacement projects at the plant are identified and planned based on age of facility, life cycle of equipment, reliability and regulatory changes. The pipe chase replacement project will encompass 2 capital budget years (2019 and 2020). In 2019, the replacement of piping, valves, and flowmeters for filter basins 1,3,5 (near the end of their expected service life) will be completed. Replacement of the piping, valves, and flowmeters for filter basins 2,4,6 (also near the end of their expected service life) will be complete in 2020. In the event that the pipe chase replacement project is completed under budget, the remaining funds will be used to paint the interior and exterior of the raw water building (due to cracking, flaking and other signs of wear). These projects are necessary to assure continued, reliable, uninterrupted operations of the water plant. This project will not change ongoing maintenance costs for the water plant overall, but deferred investment would result in increases to maintenance.

List any obstacles for implementation

All major maintenance at the water plant faces the challenge of doing the work while continuing to operate the plant and provide water. The plant cannot be shut down for an extended period for maintenance. This work is scheduled for winter when we have low water demand when we have the best opportunity for limited shut downs.

Finance Use Only

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Brynn Goe  
 Department Head Review: Anne Beierle

Responsible Department: Public Works  
 Fund: Water #11

Project Name:	<b>Water Quality/Plant Improvements - PLC replacement</b>				
Brief Description:	replacement of PLC's (programmable logic ocntrrollers) used for automation at the water treatment plant, pump stations and tanks				
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
New/Additional Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No New/Additional Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility/ Safety Issue No
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		100,000	100,000	100,000	100,000	100,000	100,000					600,000
On-Going Maintenance												-
<b>Total Project Costs</b>	-	100,000	100,000	100,000	100,000	100,000	100,000	-	-	-	-	600,000

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate												-

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Water Quality/Plant Improvements - PLC replacement

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

Operation of Golden's water treatment plant has been automated using a control system and PLCs that control individual components of the plant such as pumps, valves and chemical feeders. PLCs are essentially small programable computers that communicate with a central control system. The potable treatment plant and distribution system contains dozens and dozens of individual PLCs. As with all technology, PLCs are quickly outdated. In the past we have replaced all the PLCs at once in a comprehensive program. Doing the upgrades in this manner is expensive and presents challenges for continuous operation of the plant. This multi-year replacement program spreads the project over several years. This project is necessary to assure continued, reliable, uninterrupted operations of the water plant. This project will not change ongoing maintenance costs for the water plant overall, but deferred investment would result in increases to maintenance. In 2018, funds were used to complete a comprehensive PLC and SCADA system inventory to better plan for the changes in technology and cost associated with PLC upgrades. In 2019, funds are being used to complete an updated SCADA masterplan. As of 2019, there is a total of 33 PLC's in the water plant and distribution system. Each unit has a life expectancy of 8-10 years and the cost to replace a single unit (including hardware and labor) is approximately \$18,000. The number of individual PLC units will also increase as time goes on and more of the plant and distribution system becomes further automated. New regulatory instrumentation at the water plant and in the distribution system will also add to the number of PLC units as instrumentation becomes more automated and communicates better with our SCADA system.

List any obstacles for implementation

All major maintenance at the water plant faces the challenge of doing the work while continuing to operate the plant and provide water. The plant cannot be shut for an extended period for maintenance. This work is scheduled for winter when we have low water demand when we have the best opportunity for limited shut downs.

Finance Use Only

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Will Stambaugh  
 Department Head Review: Anne Beierle

Responsible Department: Public Works  
 Fund: Water #12

Project Name:		<b>Pump Station improvements</b>			
Brief Description:		Pump Station equipment and facility replacement and rehabilitation			
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility Safety Issue
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Project Costs		62,400	64,896	67,492	70,192	72,999	75,919	78,956	82,114	85,399	88,815	749,182
On-Going Maintenance												-
<b>Total Project Costs</b>	-	<b>62,400</b>	<b>64,896</b>	<b>67,492</b>	<b>70,192</b>	<b>72,999</b>	<b>75,919</b>	<b>78,956</b>	<b>82,114</b>	<b>85,399</b>	<b>88,815</b>	<b>749,182</b>

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Revenue Estimate		NA	-									

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Pump Station Improvements, PS 6200 Electrical upgrade

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

Golden has nine pump stations that are essential components of Golden's water infrastructure. Gravity is used to maintain water pressure throughout the city by storing water in tanks at different elevations. From the Water Treatment Plant on Clear Creek at about 5700 feet elevation, finished water is pumped to tanks at 6000 feet, then up to tanks at 6130, 6170, 6200, 6260, and finally 6400 feet. The pump stations also provide pumped non-potable irrigation and pumped diversions from Clear Creek. Included in the Pump Station infrastructure are four automated control valves and a Bulk water station, plus nine pressure reducing valves which are not automated. This project will not change ongoing maintenance costs for pump stations overall, but deferred investment would result in increases to maintenance.

In 2019 the following improvements/replacements are planned at existing pump stations:

- 1.) Electrical system Upgrade at the 6200 Pump Station.
- 2.) The 6200 pump station is over 35 years old. The current electrical system is aging and damaged. The power to pump motors is transmitted through conduits in the floor of the building and currently intercepts ground water. Also with our SCADA system, the current electric system creates interference with process controls. There are also safety and reliability concerns with the current system. The new electric system will eliminate interference with SCADA instrumentation, will be better grounded for safety, and will include more efficient lighting.
- 3.) The measure of success is improved reliability and safety, better lighting for maintenance personnel, and a generally more efficient pump station. The effective life of the pump station will be extended.
- 4.) No new generated revenue is expected. There will be a small reduction in electrical operating costs.

List any obstacles for implementation

Finance Use Only

	Date
Received by Finance Department	
Reviewed by City Manager:	



Completed by: Les Major  
 Department Head Review: Anne Beierle

Responsible Department: Public Works  
 Fund: Water #13

Project Name:	<b>Storage Tank Improvements</b>				
Brief Description:	Replace existing interior and exterior coatings on potable water tanks				
Funding Source	Existing Grant Funds Identified for Project	Potential Grant Funds Identified	Funds Identified From Capital Project Fund	Funds Identified From Other Fund (Name)	No Identified Funding
Revenue Generated	Significant Ongoing Revenue Source	Small Ongoing Revenue Source	One-Time Revenue Generated	No Revenue Generated	
Legally Mandated	Court Decision	Regulatory Requirement	Pending Legal Action	Potential Legal Action	Normal Liability
Public Health & Safety	Existing Severe Hazard	Existing Minor Hazard	Potential Severe Hazard	Potential Minor Hazard	No Health or Safety Issue
Operating Budget Impact	Decreases Operating and/or Personnel Costs	Minimal or No Impact on Operating and/or Personnel Costs	Slight Increase to Operating and/or Personnel Costs	Significant Increase to Operating and/or Personnel Costs	
Environment and Sustainability	Enhances Environment and/or Sustainability	Benefits Environment and/or Sustainability	No Environmental Impact	Minor or Negative Environmental Impact	Diminishes Environment
% Of Population Served	100% of Population Served by Project	Majority of Population Served	Approximately 50% of Population Served	Less than 50% of the Population Served	
Preservation of Facility	Loss of Facility Imminent without Project Completion	Additional Damage Likely without Project Completion	Project Constitutes Normal Major Maintenance	Project Constitutes Normal Minor Maintenance	New Facility Safety Issue
Project Useful Life	20+ Years With Little/No Maintenance	20+ Years With Normal Maintenance	10-20 Years With Normal Maintenance	5-9 Years with Normal Maintenance	1-4 Years with Normal Maintenance
Conformity to Strategic Plans & Department Goals	Critical to accomplishing Established Plans / Goals	Assists in Accomplishing Established Plans / Goals	Will Not Assist or Will Hinder Accomplishing Plans / Goals	Recommended by City Council	Recommended by Staff
Recreational or Aesthetic Value	Major Value	Moderate value	No Value	Possibly Detrimental	
Estimated Frequency of Use	Every Day	Several Times per Week	Several Times per Month	Once per Month or Less	

**Vision 2030 Guiding Principles Priority - (Choose One Best Fit)**

(A) Safe and Reliable Public Infrastructure   
 (B) Economic Vitality and Community Amenities that Improve Quality of Life   
 (C) Public Safety   
 (D) Other

**Category of Capital Expenditures - (Choose One Best Fit)**

Land Improvement   
 Building Improvement   
 Equipment   
 Vehicle   
 Technology   
 Infrastructure

Financial Impact - Expenses												
	Life-To-Date*	2020	2021	2022	2023	2024	2025	2026	2027	2027	2029	Total
Project Costs		300,000	150,000	100,000	100,000	100,000						750,000
On-Going Maintenance												-
<b>Total Project Costs</b>	-	300,000	150,000	100,000	100,000	100,000	-	-	-	-		750,000

\*Life-to-date includes any actual expenditures from start of project through July 2017 and estimates for the remainder of FY 2017

**Basis for Project Cost Estimate**

Formal Proposal   
 Contractor/Engineer Estimate   
 State Purchasing Co-Op   
 Staff Estimate

Financial Impact - Revenues												
	Life-To-Date*	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
Revenue Estimate												-

\*Life-to-date includes any actual revenue generated from start of project through July 2017 and estimates for the remainder of FY 2017

Project Name:

## Storage Tank Improvements

Please provide details for the following:

1. Project Description
2. Justification
3. Measure of Success
4. Description of Revenue Generated (if applicable)

The City of Golden owns ten tanks that serve as potable water storage for the citizens of Golden. Four tanks are above ground steel tanks with an expected life of 70-80 years. Six are concrete tanks with an expected life of 100+ years. Repainting the steel tanks with new polymer based coatings will extend the life of the existing structures and ensure good water quality for the next 20 plus years. This project will not change ongoing maintenance costs for storage tanks overall, but deferred investment would result in increases to maintenance. 2020 project is structural roof repairs and recoating interior of 6200 # 2. 2021 projects include drainage improvements, rock scaling and grouting of the slope adjacent to the 6130 tank.

List any obstacles for implementation

Interior coating requires that the tank be taken out of service. This presents the challenge of doing the work while continuing to provide adequate storage and water to those served by the tank. This work is scheduled for winter when we have low water demand we can meet system demand without the tank.

*Finance Use Only*

	Date
Received by Finance Department	
Reviewed by City Manager:	