



# Wastewater Treatment Facility analysis and Capital Improvement Plan Development

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OAKRIDGE

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PPPM 415 POLICY ANALYSIS AND PPPM 636 PUBLIC POLICY ANALYSIS | SCHOOL OF PLANNING, PUBLIC POLICY AND MANAGEMENT



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**Guen DiGioia**, Community & Climate Resiliency Coordinator, Southern Willamette Forest Collaborative

This report represents original student work and recommendations prepared by students in the University of Oregon's Sustainable City Year Program for the City of Oakridge. Text and images contained in this report may not be used without permission from the University of Oregon.

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## About SCI

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The Sustainable Cities Institute (SCI) is an applied think tank focusing on sustainability and cities through applied research, teaching, and community partnerships. We work across disciplines that match the complexity of cities to address sustainability challenges, from regional planning to building design and from enhancing engagement of diverse communities to understanding the impacts on municipal budgets from disruptive technologies and many issues in between.

SCI focuses on sustainability-based research and teaching opportunities through two primary efforts:

**1. Our Sustainable City Year Program (SCYP)**, a massively scaled university-community partnership program that matches the resources of the University with one Oregon community each year to help advance that community's sustainability goals; and

**2. Our Urbanism Next Center**, which focuses on how autonomous vehicles, e-commerce, and the sharing economy will impact the form and function of cities.

In all cases, we share our expertise and experiences with scholars, policymakers, community leaders, and project partners. We further extend our impact via an annual Expert-in-Residence Program, SCI China visiting scholars program, study abroad course on redesigning cities for people on bicycle, and through our co-leadership of the Educational Partnerships for Innovation in Communities Network (EPIC-N), which is transferring SCYP to universities and communities across the globe. Our work connects student passion, faculty experience, and community needs to produce innovative, tangible solutions for the creation of a sustainable society.

## About SCYP

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The Sustainable City Year Program (SCYP) is a yearlong partnership between SCI and a partner in Oregon, in which students and faculty in courses from across the university collaborate with a public entity on sustainability and livability projects. SCYP faculty and students work in collaboration with staff from the partner agency through a variety of studio projects and service-learning courses to provide students with real-world projects to investigate. Students bring energy, enthusiasm, and innovative approaches

to difficult, persistent problems. SCYP's primary value derives from collaborations that result in on-the-ground impact and expanded conversations for a community ready to transition to a more sustainable and livable future.

Community partnerships are possible in part due to support from U.S. Senators Ron Wyden and Jeff Merkley, as well as former Congressman Peter DeFazio, who secured federal funding for SCYP through Congressionally Directed Spending.

# About City of Oakridge

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The City of Oakridge, Oregon, is a vibrant community nestled in the foothills of the Western Cascade Mountains, with a population of approximately 3,500 residents within city limits (nearly 5,000 when including nearby Westfir and surrounding areas). Surrounded by the extensive Willamette National Forest, the city provides ample opportunities for activities such as hiking and mountain biking, with nearly 500 miles of trails and five rivers in its vicinity. Oakridge's elevation (1,200-1,700 ft.) results in a favorable climate, characterized by over 300 sunny days annually, while avoiding the fog of the valley and the heavy snowfalls of higher elevations.



Governed by a council-manager system since 1972, Oakridge residents benefit from a robust and supportive municipal administration. The City offers a comprehensive range of services, including street maintenance, water, wastewater, and park utilities, as well as police, fire, and emergency

medical services. Additional municipal services include library access, economic development, planning and zoning, and general administrative support. Funding for city operations is derived from property taxes, franchise fees, and other revenue sources, with special projects financed through grants and loans.

In the past decade, Oakridge has secured nearly \$11 million in grants and loans for community projects and maintains an annual budget of approximately \$10 million.

The citizens of Oakridge cherish their history and cultural heritage, celebrating it through a variety of events and activities throughout the year. The long-standing Tree Planting Festival pays homage to Oakridge's timber town roots, while the Concerts in the Park series offers free performances at the Banner Bank Amphitheater in Greenwaters Park. Additionally, Oakridge features four art galleries, three nearby hot springs, and is conveniently located just 25 miles from Willamette Pass Ski Resort. The Eugene-Springfield metropolitan area, approximately 35 miles away, further enriches the community's cultural

offerings with its vibrant arts scene, including music, theater, and access to the University of Oregon.

The City of Oakridge is committed to fostering a safe, livable, and sustainable environment for its residents while promoting economic development and community engagement. As part of its ongoing planning initiatives, Oakridge is exploring various strategies to enhance its sustainability and growth, ensuring that the community continues to thrive for generations to come. The partnership between the Sustainable City Year Program and the City of Oakridge is supported by local stakeholders, enabling University of Oregon students and faculty to collaborate on projects and provide recommendations to address city-identified challenges and opportunities.

## Course Participants

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### PPPM 415 POLICY ANALYSIS UNDERGRADUATE STUDENTS

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# Course Description

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## **PPPM 415 POLICY ANALYSIS**

This course introduces students to some of the major issues that policymakers and planners contend with by designing and developing courses of action for client-oriented advice relevant to public decisions informed by social values. This includes evaluation of results and understanding limitations in applying systematic analysis to political issues. This is accomplished by examining policy problems through an economic, political, institutional, and social equity lens informed by analytical frameworks that policy makers and analysts utilize to evaluate policy solutions to inform decision making. The primary focus of this course is the analyses of U.S. public policies, including topics on housing, energy, drug legalization, environmental pollution, health, poverty, and wellbeing.

## **PPPM 636 PUBLIC POLICY ANALYSIS**

In this course, graduate students examine the techniques in the policymaking process. Course outcomes focus on determining the impact of policies, comparing alternatives, and determining the likelihood that a policy will be adopted and effectively implemented.

## Executive Summary

This project addresses the City of Oakridge's capital improvement planning and potential funding sources for the city's aging infrastructure, focusing primarily on the wastewater treatment facility (WWTF). Throughout the term students and faculty toured the WWTF, and other locations and produced a SWOT (Strengths/Weaknesses/Opportunities/Threats) analysis. After aggregating and organizing best practices research from comparable communities (e.g. similar geographic and demographic characteristics), and discussing operational and resiliency needs at the facility, a complete policy analysis was conducted. Existing equipment upgrades as well as additional capabilities were evaluated and integrated into a consolidated CIP for the WWTF.

Subsequently, several recommendations were submitted for potential adoption into the City of Oakridge's nascent Capital Improvement Plan (CIP) along with needed upgrades. Inflow and Infiltration concerns dominate the overall effective functioning of the WWTF in the near term. A detailed budget and strategy is included as part of the analysis.

In addition to the WWTF, students identified three additional areas for inclusion into the CIP, making general recommendations for water treatment, street maintenance, and public building (incl. energy efficiency) upgrades. These areas did not include a comprehensive policy analysis.

## Introduction

The City of Oakridge (Oakridge) requested assistance with its capital improvement planning and identification of potential funding sources to upgrade or replace its aging infrastructure, including water, sewer, streets, parks, and other essential infrastructure. Among other city-owned and maintained infrastructure, the city is responsible for four active wells and pump houses, three 1-million-gallon tanks, 23 miles of water mainlines, 22 miles of sewer mainlines, and an aerobic sequential bacterial reactor wastewater treatment plant. At present there are no replacement or upgrade plans and with no funding set aside in the event of infrastructure failure, the city may be vulnerable. In response to these issues, Oakridge intends to develop a long-range capital improvement plan (CIP) for city facilities that will include:

- a.** Strengths, Weakness, Opportunities and Threats (SWOT) & gap analysis
- b.** Review of comparable cities' best practices
- c.** Cost analysis, city-wide phased plan

- d.** Investigation of possible funding sources such as grants
- e.** Research and development of funding strategies
- f.** Research of best practices and benefits of establishing system development charges
- g.** Facilitation and documentation of the public involvement process
- h.** Presentation to the City

As sewage delivery and treatment is a complex and critical component to city-provided services, Oakridge staff determined that CIP inputs to Oakridge's Wastewater Treatment Facility (WWTF) would be the highest priority to study. Over two 10-week academic terms, students focused on components a.-e. above (f.-h. were outside the project scope). Over fall term students conducted preparatory work that included a., Strengths, Weaknesses, Opportunities, and Threats (SWOT Analysis) of a proposed WWFT update (Figure 1). Students responded to both internal and external factors.

## BASIC SWOT MATRIX FOR CITY OF OAKRIDGE WWTF UPGRADE



**FIG. 1**

Slide Deck Student Final Presentation

As a next step, fall term students collaborated with Oakridge city staff to select criteria in order to evaluate potential policy alternatives for WWTF CIP. Selected criteria to address included (see also Figure 2):

1. Minimizes Environmental Risk
2. Adaptive to Changing Technology and or Growth
3. Economic Efficiency (10+ years)
4. Resilient to Natural or Manmade Disasters

# Criteria for W25 Alternative Recommendation

For the Oakridge WWTF project, rank each of these possible criteria that will be used to evaluate the policy alternatives by moving them from highest priority (top) to lowest priority (bottom).

Response options	Rank
Minimizes Environmental Risk	1st
Adaptive to changing technology and/or growth	2nd
Economic Efficiency (Long-term > 10years)	3rd
Resiliency to natural or man-made disasters	4th
Potential for external funding via grants (min. 20% funding)	5th
Public Acceptance	6th
Political Feasibility	7th
Economic Efficiency (Short-term < 10years)	8th

UNIVERSITY OF OREGON 2

FIG. 2

## POLICY SCENARIOS

Over winter term 2025, students applied recommendations and outcomes from fall term including an analysis and response to the following four policy scenarios:

1. It is expected that in the coming years, the EPA will release new restrictions on spreading solid waste due to polyfluoroalkyl substances (PFAS) present in most processed waste. What is the recommended solution to the disposal of solid waste if these recommendations are implemented, and at what cost to the city?
2. Wildfires in Oregon are becoming more frequent and deadly. Due to the location of the wastewater treatment facility, what additional measures can be taken to reduce the risk of fire danger?
3. The age of the wastewater treatment facility backup generator is such that it should be replaced in order to ensure backup power is available when needed. What replacement plan should the city pursue to ensure backup power is available for the site?
4. The wastewater treatment facility is a significant contributor to climate change. Nitrous oxide (N2O), a potent greenhouse gas (GHG) is released into local waterways from the treated wastewater. The aerobic sequential batch generator process also generates tons of biosolids that emit methane (NH4) and carbon dioxide (CO2) as a result of the settling process. What technology can be adopted to help reduce the impact of the facility and provide revenue for its operation?

Students analyzed each scenario and proposed two to three policy alternatives, followed by a recommendation for their determination as to what would be the most appropriate solution for the city of Oakridge. Recommended options are detailed within the report while detailed alternative policy scenarios are provided in the appendices.

### SUMMARY ALTERNATIVE/ CRITERIA MATRIX

The final step constituted of evaluating the proposed WWTF alternatives by criteria (Table 1) given a scale from low, medium, high.

	Minimizes Environmental Risk	Adaptive to changing technology and/or growth	Economic Efficiency	Resiliency to natural or manmade disasters
Solid Waste Disposal: Business as usual and transportation when required (Recommended)	Low	High	High	High
Solid Waste Disposal: Biochar Technology	High	Medium	Medium	Medium
Onsite Resiliency: Construct on site water tower (Recommended)	High	Medium	High	High
Onsite Resiliency: Business as Usual	Medium	Low	High	Low
Backup Power: Replacement Diesel Generator (Recommended)	Low	Low	Low	High
Backup Power: Backup Battery System	High	High	Medium	Low
Backup Power: Continue Using Current Generator Until Failure.	Low	Low	Medium	Low
Onsite Power Generation: Small PV Array (Recommended)	Medium	Low	High	Medium
Onsite Power Generation: Business as usual	Low	Medium	Low	Medium
Onsite Power Generation: Distributed PV System	High	Low	Medium	Medium

TABLE 1

## RECOMMENDATIONS

Based on analysis, the recommended course of action for each scenario is as follows:

### Solid Waste Disposal

We recommend continuing with business as usual. Due to the high cost of adopting biochar technology and the highly cost-effective current disposal technique it was determined not to be fiscally responsible to update the facility for the removal of solid waste PFAS. There is no set timeline for the implementation of PFAS requirements by the EPA, and the current federal administration has made clear that environmental protections are not a priority. Once new guidelines are set or a definitive timeline is created, we would recommend re-reviewing the cost of biochar implementation against the cost of solid waste transportation to a processing facility. If the cost of biochar technology decreases as more facilities adopt it, it may become an economically efficient model.

### Onsite Resiliency

We recommend the construction of a 36,000 gallon water tower on site to be filled with treated wastewater. This will provide 2 hours of firefighting water at the wastewater facility to prevent significant damage from wildfires while the city awaits response from County and State firefighting agencies.

### Backup Power

We recommend replacing the diesel generator. We also recommend that the new generator be updated to a 175 kW exterior model and in space available in the electrical room used to install a second transfer switch that would power the pumps and blowers for the reactor tanks. This will provide higher operational capabilities and will provide the power needed to treat an influx of water from an extended rain event.

### On-Site Power Generation

We recommend the construction of a 40 kW photovoltaic solar array at the wastewater treatment facility. This will provide approximately 12% of the power used at the wastewater treatment facility annually without needing to benefit from a net metering or power buyback agreement.

### Legacy Recommendations

Included in this capital improvement plan are costs for replacing legacy equipment including pumps, blowers, updating lab equipment, and addressing inflow and infiltration into the wastewater collection system.

## FIVE-YEAR PROJECTED CAPITAL EXPENSES WITH RECOMMENDED PROJECTS

These policy recommendations were then combined with capital expenses for normal wastewater treatment facility operation to generate the following capital improvement plan. An Aggregated CIP budget is provided for WWTF Projects (Table 2).



## Ongoing Site Costs

### CAPITAL PROJECT REQUEST: WWTF LABORATORY

**Department:** Public Works

**Request Category:** Equipment Replacement (Laboratory Equipment)

**Useful Life:** 5-25 years

**Project Location:** WWTF



FIG. 3

**Project Description**

Replacement of aging water quality testing equipment at WWTF.

**Project Justification**

Note: Unfunded requirement of Mass Spectrometer may be required contingent on emerging U.S. EPA emissions standards for PFAS

**Project Cost and Proposed Financing**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Furnishings/Equipment	4/2			\$500k			\$500k
TOTALS:							
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 3**

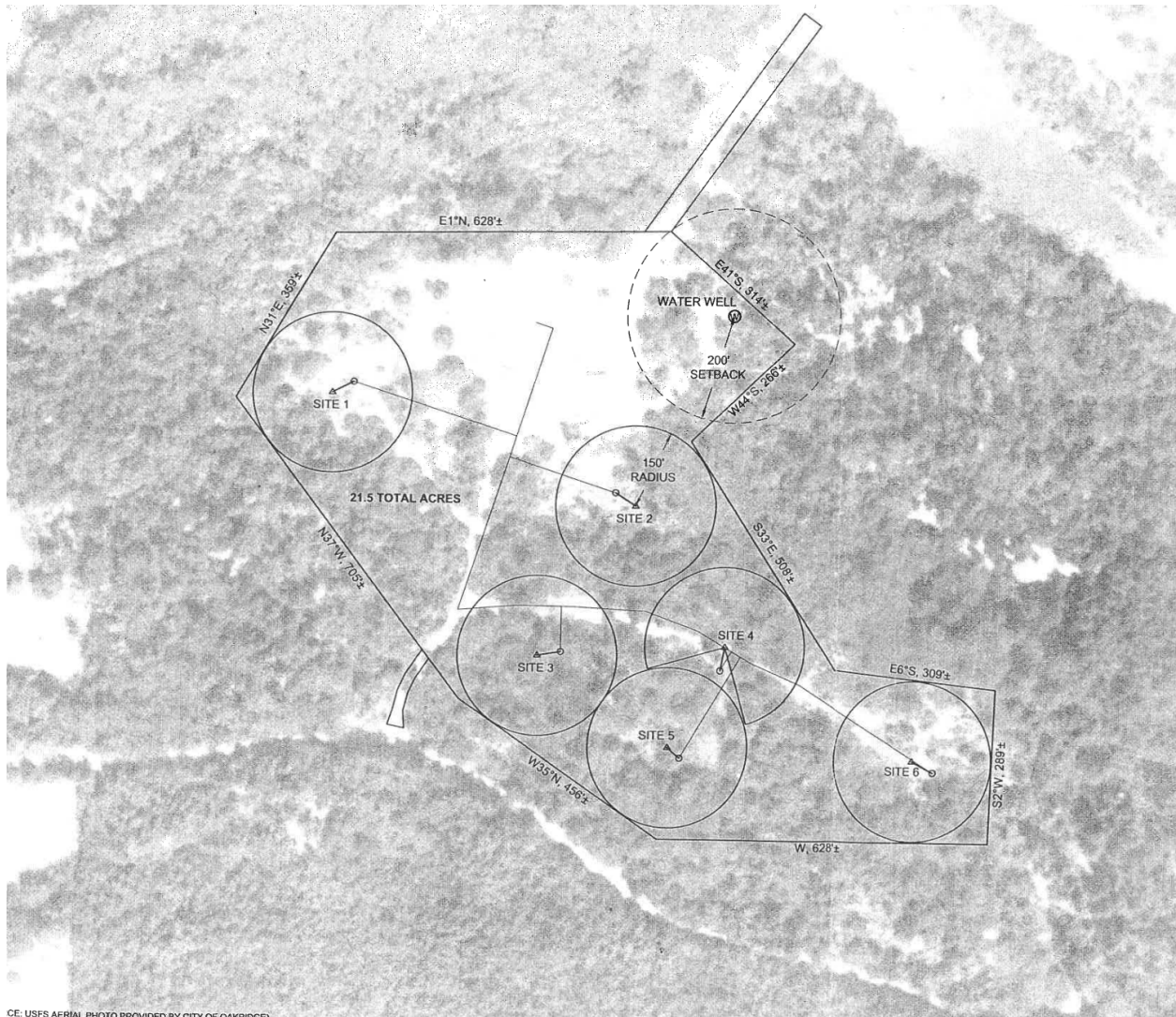
## CAPITAL PROJECT REQUEST: NATIONAL FOREST SERVICE LAND ACQUISITION

**Department:** Public Works

**Request Category:** Land

**Useful Life:** Permanent

**Project Location:** WWTF



**FIG. 4**

**Project Description**

The City of Oakridge has been operating its WWTF on 22.19 acres of federal land permitted by the National Forest Service (NFS) for decades. The latest agreement between NFS/Oakridge was signed in April 2003. The NFS permit to operate the WWTF expired on 12/31/2021 and the NFS has informed Oakridge that they do not intend to grant an additional permit.

NFS has requested that Oakridge provide a land purchase agreement at fair market value. However, NFS has not indicated a deadline for such an agreement. Given that the existing permit has expired, it is in Oakridge’s interest to reduce its exposure to permitted operations by budgeting for a land purchase within this CIP period.

The fair market value for undeveloped, highly wooded land in Oakridge, Oregon, is estimated to be between \$18,000 and \$20,000 per acre. This range aligns with current market listings for similar properties in the area.

**Project Justification**

While WWTF is not obligated to purchase the entire permitted property, it is in Oakridge’s best interest to do so for numerous reasons:

- Minimize disruption of current sludge disposal processes
- Provide flexibility to expand power generation capabilities
- Provides a controlled buffer area for natural disasters, such as wildfires and flooding

**Project Cost and Proposed Financing**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Land Acquisition	2/7	\$443,800					\$443,800
TOTALS:							
Funding Sources:							
1) General Fund	5) Street Fund						
2) Grants	6) Oakridge Industrial Park Fund						
3) Water Fund	7) Debt						
4) Wastewater Fund	8) Other						

TABLE 4

## CAPITAL PROJECT REQUEST: MAIN SEWAGE INFLUENT PUMPS

**Department:** Public Works

**Request Category:** Equipment Replacement (Main sewage influent pumps)

**Useful Life:** 15-25 years

**Project Location:** WWTF



FIG. 5

**Project Description**

Regular replacement of current operational equipment at WWTF.

**Project Justification**

*Pump Types & Cost Estimates*

- Centrifugal Dry-Pit Pumps: Hydro-Matic (Pentair)
- \$20,000 – \$50,000 per pump

*Additional Cost Considerations*

- Installation Costs: \$10,000

**Project Cost and Proposed Financing**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Regular replacement of current operational equipment at WWTF.	2,4	\$30k	\$30k	\$30k			\$90k
TOTALS:							
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 5**

## CAPITAL PROJECT REQUEST: AERATION BLOWERS

**Department:** Public Works

**Request Category:** Equipment Replacement (Blowers Settling Tanks)

**Useful Life:** 10-15 years

**Project Location:** WWTF



FIG. 6

**Project Description:**

Regular replacement of current operational equipment at WWTF.

**Project Justification:**

*Positive Displacement (PD) Blowers – Screw Type:*

- \$10,000 – \$50,000

*Additional Cost Considerations*

- Installation: \$5,000-\$10,000 depending on complexity

**Project Cost and Proposed Financing**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Furnishings/Equipment	2/4	\$50k (2)	\$50k (2)				\$100k
TOTALS:							
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 6**

## CAPITAL PROJECT REQUEST: AERATION BLOWERS

**Department:** Public Works

**Request Category:** Equipment Replacement (Blowers Square Tanks)

**Useful Life:** 10-15 years

**Project Location:** WWTF



FIG. 7

**Project Description:**

Regular replacement of current operational equipment at WWTF.

**Project Justification:**

*Positive Displacement (PD) Blowers – Screw Type:*

- \$10,000 – \$50,000

*Additional Cost Considerations*

- Installation: \$5,000-\$10,000 depending on complexity

**Project Cost and Proposed Financing**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Furnishings/Equipment	2/4	\$25k	\$25k				\$50K
TOTALS:							
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 7**

## Solid Waste Disposal Policy Analysis

The Oakridge wastewater treatment facility separates biosolids from wastewater during the treatment process. The biosolids are then further dehydrated through processes in the aerobic digesters and the sludge pond before being spread out amongst six sites near the wastewater treatment facility.

However, the EPA has stated that regulations will be implemented in the future to limit the spread of biosolids containing PFAS or other forever chemicals. If these regulations happen, the Oakridge wastewater treatment facility would need to transport its biosolids to a facility that could dispose of them properly.

### ASSUMPTIONS

- There are many providers that provide the service of transporting biosolid liquids.
- Biosolid transportation is completed as needed based on the City of Oakridge's provided wet biosolid mass estimate.
- The cost calculations are based on current market rates, facility capacity, and recent contracts.
- Potential cost fluctuations due to prices and contract negotiations are acknowledgeable.
- New EPA regulations will be released at the beginning of 2029 when the next federal administration takes office.

### CAPITAL PLANNING ALTERNATIVES

#### Alternative I

Continue spraying biosolids on site until new regulations are released and then transport biosolids to off-site disposal in Roseburg.

Once spraying biosolids on site is no longer permitted, biosolids are transported to an external facility for proper disposal. They will be transported in accordance with the evolving EPA guidelines and regulations.

- Key Advantages: The main benefit of this alternative is that it requires no extra land or infrastructure investment. This alternative can be put into action right away readiness.
- Key Advantage: There is a fixed cost implemented for most transportation services for WWTF. While fuel costs and the number of times transported change, these trips are set as all-in-one costs when dealing with these contracts.
- Key disadvantage: This may incur recurring annual transportation costs and would not be realistic for long-term dependence on external sources facilities.

#### Alternative II

Biochar technology -Covert the biosolid into biochar to reduce the contaminated toxic chemical.

- Biochar can reduce the mass of biosolids by up to 90% and remove residue from biosolids such as biochar through the thermal treatment system.
- Biochar facilities can be installed on-site and would not require acquiring new locations or properties. The estimated space for keeping a biochar facility is roughly 5 acres.
- Key Advantages: Biochar facilities can keep a waste distribution localized to Oakridge while also producing biochar and electricity by recycling biosolids

- Key Disadvantages: Facility costs are very high and Upfront Capital Cost is extremely high.

## RECOMMENDED COURSE OF ACTION

(Cost Analysis of Alternatives not recommended are in Appendix A)

The costs of the biosolids transport service are structured based on recent estimates from the town of Canby located 133 miles northwest of Oakridge. With an estimated cost of up to \$180,000 a year for the town of Canby, which is near 5x the population of Oakridge, we based our cost plan on assuming a high-end biosolid creation for the town of Oakridge. With this understanding of the major population and location difference, we assume a cost of up to \$90,000 if using a similar company and contract. [NOTE: Relative costs will be higher if sludge is not processed and must be hauled in a tanker truck. Few facilities in the region transport sludge in this form, so cost estimates are elusive.]

One of the largest factors that may greatly reduce the costs of the contract is the distance of transportation, as Canby transports their waste over 160 miles to Roseburg, OR to be treated as Class B biosolids via Sutton Trucking. The transportation is significantly shorter for transportation from Oakridge with the

likely transportation route being around 100 miles. The surcharge for Sutton Trucking, based on current fuel prices within the area, is around 11.5% and with the change in distance of 60 miles, around 6 gallons of fuel cost will be saved based on trip length. The fewer biosolids produced and shorter transportation trips may be able to help bring down overall costs, assuming Heard Farms continues to be a viable option for biosolid transportation from Oakridge. The lagoon facility, according to Oregon's National Biosolid Data Project from 2018, treats 11 different WWTP's within the state making it likely a highly viable option for the Oakridge to be served through. The overall costs will largely be affected, however, through negotiations and other contract bids from other possible transportation, facilities, etc.

The table below outlines the estimated costs for transporting the biosolids as a short-term alternative. The estimated cost can be up to \$90,000 per year; however, other factors, such as shorter transportation routes (compared to Canby, OR) and fuel costs, may fluctuate depending on market conditions. This estimate includes our assumption that the new EPA regulations will be effective in the next presidential administration in 2029.

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Biosolids Transport Service	3	\$0	\$ 0	\$ 0	\$90,000	\$90,000	\$180,000
TOTALS:							\$180,000
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 8**

# Onsite Resiliency

## INTRODUCTION

The Oakridge wastewater treatment facility is located southeast of the city and is surrounded by forest. Due to its remote access, the frequency of wildfires in the area in the past 5-10 years, and no reliable source of water for firefighting endeavors, it is at an increased risk for damage due to fire. While the City of Oakridge itself has not fallen direct victim to forest fires in the past, it is increasingly at risk. Historically a “wet” forest climate, the lands around Oakridge include fire- adapted ecosystems which burn at more frequent rates, and put the Oakridge-Westfir area and Willamette watershed at increased risk. In fact, “Fires have burned almost 20,000 acres within 11 miles of Oakridge since 1988,” according to the U.S. Forest Service.

As a result, efforts have already been made to reduce risk in the area starting in 2007, namely through the work of the Middle Fork Ranger District cooperatively with the City of Oakridge, Emergency Services Department, the Hazeldell Rural Fire Protection District, the City of Westfir, and the Oregon Department of Forestry (ODF), who have worked together to design a thinning and fuel reduction project. The project has two prongs: thinning of the forest that border the communities, and prescribed fire to burn away the unmerchantable debris and wood after the logging activity is completed. Thinning itself acts to increase space between trees, which makes it more difficult for fire to move through the tree canopy, which is what propels wildfires to spread and become unstoppable.

As a result of forest fires concerned, as well as forecasts that estimate increased risk of forest fires in the area, the City of Oakridge should explore other methods to provide resiliency to the water treatment facility, specifically, adding a large water storage tower on- site that could be filled with treated (Graywater) wastewater and stored to provide on-site firefighting capacity.

## ASSUMPTIONS

- Primary concern is preservation of water treatment facility
- Secondary concern is preservation of community, including residents and private residencies/buildings
  - » While this is considered a potential benefit of a storage tower, recommendations will focus on the benefit to the treatment facility first, as the primary concern. Should water storage towers be considered to protect residencies or other communal areas in Oakridge, the size, source of water, and location of water storage towers would need to be evaluated to ensure maximum efficacy.
- Minimum duration to fight fires is two-hours
  - » Recommendations for smaller storage towers were considered, in order to provide Oakridge a variety of cost and risk estimates, however subsequently dismissed from the scope of recommendations after learning that Oakridge had already identified a need and risk tolerance of approximately two hours.

- Assumptions for water tower:
  - » Land for a water storage tower is already available on-site, and no space or area needs to be cleared
  - » Water does not need to be treated for potability unless otherwise required by firefighting agencies.
    - ◆ Treating the water for potability to increase potable water for Oakridge residents was considered, particularly after reading Oakridge resident surveys and understanding that residents were interested in reducing the cost of water utilities. While treating the water in the storage tank would be possible with a few adjustments, such as increased maintenance and a water filter, making water potable has been dismissed from the scope of the recommendation upon learning that residents would be unwilling to consume treated grey water under any circumstances.
  - » Operation of the water storage tower will require the following one-time purchases:
    - ◆ Water pump
    - ◆ Water storage tank
  - » Operation of the water storage tower will require annual maintenance to ensure grey water does not become toxic, but will not require further maintenance unless Oakridge or the treatment facility would like to make the water potable.
- Other assumptions
  - » The City of Oakridge and Lane County are supportive of a water tank, and will support the necessary permits

## RECOMMENDED COURSE OF ACTION

(Cost Analysis of Alternatives not recommended are in Appendix A)

### **Business-as-Usual (No Action):**

In the past, when wildfires approached the water treatment facility, efforts were made by staff to clear the area around the facility to limit debris and the ability for fire to spread and impact the area. These efforts proved successful at the time, particularly as the focus is to limit the wildfire's impact until trained firefighters could get to the site, and cost less than \$10,000 between the equipment, fuel costs, and man hours, which we assume was folded into operational costs and have not been outlined as an expected future cost.

Ultimately, while these responses may have proven effective in the past, it may not be good to rely upon into the future. Per a publication from the State of Oregon's Department of Environmental Quality, "Wildfire smoke impacts are increasing across the state." In fact, in 2022 "The largest fire in Central Oregon was the Cedar Creek Fire just east of Oakridge, in the Western Cascades. It started on August 1st and burned into October... In total, 127 thousand acres burned and its smoke impacted communities such as Oakridge, Eugene, Springfield, Prineville, and Bend," (2023, p. 13). While ultimately the most cost-effective option, relying on past mechanisms to prevent the spread of wildfire to the water treatment facility are inadvisable, given that "The total area burned, number of fires and size of the fires are all increasing across the western United States, including Oregon," (OHA, 2024, p. 6).

**Construction of a Water Storage Tower:**

Construction an on-site water storage tower would allow the water treatment facility to create additional protections for the area, and could in fact be used with past activities to reduce risk to forest fires, such as clearing the area, to maximize protections. This alternative involves building an elevated water storage tower with a capacity of 30,000–36,000 gallons, designed to meet firefighting demands. The initial investment covers construction, site preparation, pumps, and treatment systems with total costs estimated about \$869K over 5 years, including general maintenance.

Despite the high upfront expense, this option enhances site resilience, ensuring reliable, gravity-fed water availability during emergencies. In fact, water storage tanks are considered one of the primary methods to fight fires particularly in rural areas, where access to water to fight fires is not a given. These tanks are “designed to store a large volume of water” and “play a vital role in suppressing fires and mitigating potential property damage,” (Foxall, 2024). These tanks are considered vital not only for the water they provide, but specifically because they can so easily be integrated into comprehensive fire plans.

To assess what kind of water tank would be required, we reviewed:

- Location
- Ease of Access
- Source of Water
- Cost
- Durability

With this in mind, we found that a gravity tank or suction tank, constructed of steel, would be the most option for the water treatment facility, as a result of the land available at a facility as well as

long-term needs of the tank. The final decision would rely on the land available at the facility— gravity tanks require far less space, however suction tanks are the most cost effective model (NFPA, 2024). We recommend steel for construction, due to the affordable cost, and the expected lifespan—a steel water storage tank can last at least 40 years.

Then, with the knowledge that a water storage tank would need to last 90-120 minutes, we recommend a total inside and outside hose capable of at least 250 gallons per minute to sustain the water and pressure needed for adequate fire protection (Mahoney, 2024). Next, as a result of requirements, an inlet pipe would be required to fill the tank within 8 hours or less, within 4 inches/100mm of the required fire protection level (NFPA, 2024). As this is determined by required capacity, this would need to meet a threshold of at least 30,000 gallons. We recommend an automatic tank fill to do so. Finally, testing would need to occur every year to follow proper maintenance guidelines for water storage towers that use treated grey water (Corum, March 2017). Should water ever be made potable—although this is outside the recommendation— maintenance would need to occur at a much more frequent rate.

This recommendation is also the most sustainable of the two options— integrating wastewater aligns with environmental sustainability while also making use of existing resources in the area. The construction would endure for 40 years, which would provide the area with much needed long- term firefighting capacity, using materials that provide limited known harm to the environment.

**Policy Alternative I: Business-as-Usual**

While the cheapest option in the short term, it exposes the site to significant

financial risks from potential fire damage. It is a high-risk, low-reward approach that may be far more expensive in the event of a crisis. While it can be replicated every year, and costs have already been folded into the operating budget, this model does not efficiently mitigate risk, adapt to the changing environment of Central Oregon, protect economic output, or maximize resiliency.

### **Policy Alternative II: Construction of a storage tower**

#### *Minimizing environmental risk*

The construction of a water storage tower is an environmentally low-risk alternative, especially when paired with modern treatment, energy-efficient pumps (which use renewable energy sources e.g. solar), and proactive maintenance (like coating against corrosion or damage and regular inspection for leak detection). Its enclosed design helps safeguard water quality and reduces contamination risk and evaporation.

#### *Adaptive to changing technology/growth*

The construction of a water storage tower with treated wastewater is highly adaptable to changing technology and future growth. As technological advancements in renewable energy and water treatment systems continue to evolve, the tower can integrate more efficient and sustainable solutions, such as solar-powered pumps and advanced leak detection systems. This adaptability ensures the system remains cost-effective and sustainable over time, particularly as the community and facility grow. Additionally, the tower's design allows for easy modifications or expansions if the demand for water increases due to population growth or more frequent wildfires. Should desired in case of future water crisis, a water tank made of steel

can also be adapted to filter water to become potable with minimal capital costs. These water filters are easily adaptable to new technologies, and could reflect changes technology or climates as needed.

#### *Economic efficiency*

While the initial investment is substantial, the long-term benefits of fire safety, operational savings, and environmental compliance make this policy alternative financially and strategically valuable.

#### *Resiliency to natural or man-made disasters*

A water storage tower scores highly in resilience and reliability, offering a dependable water source with gravity-fed flow, long infrastructure lifespan, and reduced dependence on external systems. Towers can store enough water for 2-hour fire suppression and maintain constant water pressure through gravity, ensuring immediate access to water. A tower reduces reliance on municipal water supply or external infrastructure, offering a self-contained solution for firefighting capacity.

## **RECOMMENDED COURSE OF ACTION**

We recommend that the City of Oakridge build a water storage tower in order to fight fires. While the past method to respond to fires was effective at the time, the likelihood of the wildfire climate in Oregon increasing is quite high. Furthermore, the capacity of 30,000+ gallons of water to fight fire for two hours is reflected by other municipalities such as Carroll County, Maryland (Davis, 2018), although in the case of this example the type of water storage tank differs due to the lack of on-site water.

To appropriately respond to future risk, a long-term solution such as a water storage tower, which can last for up to 40 years, would be appropriate to ensuring the water treatment facility is not damaged, if and when circumstances such as in 2022 and 2020 be repeated. That said, after reviewing the criteria, we elected to choose an elevated gravity water tank, as suction tanks are usually sized larger than 50,000 gallons (New York Engineers), exceeding desired parameters.

**Specifications of the Storage Tower**

As per firefighting water demand, for a 2-hour supply for at 250 GPM, 30,000 gallons is recommended with a 20% buffer for safety amounting to 36,000 gallons. The material is suggested as steel with the height of tank itself as 50 ft. and diameter of 55 ft. As the tank is elevated to maximize gravity-fed pressure, with the pedestals it would be 100-140 ft. giving for 43-60 psi. In terms of soil stability and structural support, the site must support the tower’s weight when full. The tank will need a hose with a minimum 1.5” diameter, with a water pump capable of at least 11 HP to reach the required GPM.

**Maintenance**

Finally, in terms of maintenance, water storage tanks that contain grey water met for purposes such as irrigation or fire control require inspection every year, with water replacement every 1-5 years should the following criteria be met:

- Sediment or biological growth
  - » A particular concern given the use of grey water
- Noticeable changes in water quality

Inspection and water treatment is low-cost. Certified inspection ranges from \$1,500-\$3,000 depending on the maintenance required, which we

anticipate to be limited although in a rural area such as Oakridge, additional costs have been factored in for travel. Repair for issues within a water tank can cost \$13,000-\$15,000, while pump repair generally costs \$1,500-\$3,000. These issues should not occur prior to the five-year mark but should be folded into the operating budget of the WWTF. Issues with the water storage tank itself should be covered through warranty, which generally last at least twenty years (National Tank Outlet, 2025).

**THE EXPECTED MAJOR COST DRIVERS**

A WWTF treated water storage project usually involves:

- Construction Costs – The largest expense, covering:
  - » Earthwork and site preparation
  - » Storage tank/reservoir construction (e.g., reinforced concrete, steel, or lined earthen storage)
  - » Pumping systems and pipelines
  - » Electrical and automation controls
- Upkeep & Maintenance – Annual costs for:
  - » Pumping and monitoring
  - » Structural inspections
  - » Cleaning and repairs
- Other Costs – Includes permitting, engineering design, contingency funds (typically 10-20% of the budget).

**ROUGH COST ESTIMATES (INDUSTRY BENCHMARKS)**

- Water storage tanks (36000G) typically cost \$300Kto \$450K depending on material, capacity, and site conditions.
- Pipeline installation (if required) costs \$100-\$500 per linear foot.
- Pumping stations range from \$25,000 to \$50,000
- Industrial fire hoses range from \$350-\$450

## ESTIMATED COST BREAKDOWN FOR THIS PROJECT

Category	Estimated Cost (USD)
Tank Construction (30,000 gal)	\$300,000 - \$450,000
Pumping & Pressure Systems	\$25,000 - \$50,000
Permitting & Engineering Fees	\$40,000 - \$80,000
Contingency (10-15%)	\$36,500 - \$87,000
<b>Total Estimated Cost</b>	<b>\$396.5K - \$667K</b>

TABLE 9

### ANNUAL MAINTENANCE & OPERATIONS COSTS

(Corum, February 2017)

#### Inspection, Cleaning, Repairs: less than \$2,400 every year

- Annual maintenance and inspection should cost less than \$1,500 unless water needs to be treated and replaced, which will increase costs
- Minor repairs such as to pump or hose systems cost between \$500-\$900, although most issues should be covered by warranty

#### Water Pumping Costs: \$100-\$120

- Depends on re-fills of water required. Costs vary depending on how often water storage tank is depleted. Includes water treatment and electricity.
  - » Costs of General Water Treatment: \$100
- Using cheap cleaners such as chlorine will be sufficient for the expected use

#### Total Annual Cost: \$2,500 per year

### COST BY FISCAL YEAR

If construction is phased over five years, costs could be allocated as follow:

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Design and Permits	General Fund	\$50,000	-	-	-	-	\$50,000
Tank and Site Work	Grants, Debt	-	\$500,000	-	-	-	\$610,000
Pumping and piping	Grants, Debt	-	\$40,000	-	-	-	\$200,000
Upkeep/Maintenance	Wastewater	-	-	\$2,500	\$2,500	\$2,500	\$7,500
Other							
<b>TOTALS:</b>		<b>\$50,000</b>	<b>\$540,000</b>	<b>\$2,500</b>	<b>\$2,500</b>	<b>\$2,500</b>	<b>\$597,500</b>
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                        7) Debt 4) Wastewater Fund                8) Other							

**TABLE 10**

## Backup Power

### INTRODUCTION

The Oakridge emergency generator has been in operation for over 15 years. Typical useful life for diesel generators is from 20 to 25 years. Given the environmental consequences of a total loss of power at the wastewater treatment facility, action is necessary to maintain a reliable backup generator. The current electrical equipment is configured to supply backup power to the main influent pumps, blowers for the aerobic digester, and power for the water chemistry laboratory, but does not supply power to the sequence batch reactor pumps or blowers.

### ASSUMPTIONS

There are three assumptions for the backup power management Capital Improvement Plan (CIP):

1. A 175-Kilowatt (kw) generator will be sufficient to run the entire plant in the case that the plant loses power. The recommendations, analysis, and pricing are based on this assumption. This sizing is based on the current generator loading and equipment sizing in the panels without backup power. To determine the exact amount the generator would need to handle, the Wastewater Treatment Facility (WWTF) would need to conduct a load study.
2. The level and goals of federal grants will not remain constant.

### CAPITAL PLANNING ALTERNATIVES

#### Invest in a New Generator

As the current generator is reaching the end of its life, investing in a new generator is the most cost-effective alternative for the WWTF. The cost of a new generator would be substantially lower than purchasing a Battery Energy Storage System or keeping the current generator.

A considerable tradeoff with investing in the alternative of a new diesel generator is that it does not minimize environmental impact compared to other options. Carbon emissions, fuel spills, and air pollution are only some of the prolonged environmental impacts of using a diesel generator. Subsequently, there are fewer grants or other routes of supplementary funding available to assist in acquiring a new generator due to negative environmental impact.

The diesel generator would not be adaptive to new technology or growth because of the ongoing phasing out of them as an emergency energy source. If they continue to be phased out by government entities, then there is a likelihood that they will be utilized less in industries.

Compared to the other alternatives, a new generator would likely be the most resilient to disasters, as it could handle longer power outages.

As part of this upgrade, the WWTF would also need to invest in a second transfer switch to run the additional machinery not currently tied in to the generator. This cost is detailed below.

### **Purchase Batteries**

Investing in a Battery Energy Storage System (BESS) will provide the City of Oakridge WWTFB with better sustainability goals and resilience improvements. A BESS would provide efficient emergency power to the current systems, storing energy when there is low demand and discharging energy during outages. This will benefit the city and ensure continuous operations without relying on diesel fuel.

There are things to consider if the city were to take this route:

- A load study would be required to determine battery sizing based on required hours of backup power.
- The cost and funding of a new sustainable battery storage system could be costly. The capital investment is higher than replacing the diesel generator, though it will offer long term sustainability. The funding for this new system could offset costs with federal grants and their incentive.
- The operational benefits would reduce the reliance on diesel fuel and minimize the emissions that align with the city's sustainability goals. This will also provide a seamless transition during power outages requiring less maintenance and needs than the current diesel generators.

- The system can reduce costs for outages, through the elimination of fuel usage.
- There will be challenges and different mitigation strategies that will also need to be taken into consideration. This battery energy storage system would cost more upfront, there will be limited storage duration, and new technology advancements that will require more investments to sustain the battery life cycles.

### **Keep Current Generator (Status Quo)**

As the generator ages, its reliability is diminished, and the chances of a critical failure increase. Due to the current generator size, it is also unable to run the reactor pumps and blowers, reducing the maximum influent flow that can be treated. A power failure during a severe rain event could possibly overcome the system.

This failure would provoke serious and long-term harm to both the facility itself, the environment, public health, and economic prosperity. Without a functioning plant, there is an elevated risk of water pollution as the WWTF would not be processing and treating the incoming wastewater. The incoming wastewater would either backup and cause problems on the input end or the wastewater would overflow and cause problems on the output end at the facility, flowing into the surrounding land. Further, without a functioning plant, there is an increase in public health risks as the wastewater would be untreated. This would increase the spread of disease, increase airborne

contaminants, and could even seep into the groundwater or water supply systems contaminating the drinking water. Additionally, without a functioning plant, there would be steep economic costs, thus harming the economic prosperity of the plant and the city. There would likely be fines from the EPA as the wastewater would cause harm to the environment and exceed the EPA limitations. Further, there would be high costs to cleaning up the results of the WWTF loss of power. The plant itself would need to be cleaned as the incoming wastewater would either be sitting in the systems, not processing, and harming the equipment, or it would be seeping out of the containment systems

and out into the plant. Further, the environment would need to be cleaned as well. Thus, there would be economic harm from the power loss.

**RECOMMENDED COURSE OF ACTION**

The City of Oakridge should invest in a new diesel 175-Kilowatt (kw) generator as a source of backup energy to run the Wastewater Treatment Facility in the event of an emergency power outage. As the current backup generator is increasingly unreliable, purchasing a new diesel generator is the most cost-effective alternative to solving this issue.

**COST ESTIMATES FOR NEW DIESEL GENERATOR**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
New Generator	Grants	\$0.00	\$47,000.00	\$0.00	\$0.00	\$0.00	\$47,000.00
Instillation	General	\$0.00	\$20,000.00	\$0.00	\$0.00	\$0.00	\$20,000.00
Energy Costs	General	\$750.00	\$750.00	\$800.00	\$800.00	\$800.00	\$3,900.00
Upkeep/Maintenance	General	\$300.00	\$300.00	\$300.00	\$300.00	\$300.00	\$1,500.00
Switch	Grants	\$0.00	\$8,700.00	\$0.00	\$0.00	\$0.00	\$8,700.00
<b>TOTALS:</b>		<b>\$1,050.00</b>	<b>\$76,750.00</b>	<b>\$1,100.00</b>	<b>\$1,100.00</b>	<b>\$1,100.00</b>	<b>\$81,100.00</b>
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 11**

# Onsite Power Production

## INTRODUCTION

The Oakridge Wastewater Treatment Plant consumed approximately 400MWh of electricity in 2024. Based on Oregon's electricity carbon intensity values in 2024, Lane Electric produced 5.97 tons of carbon dioxide per MWh of electricity, meaning the wastewater treatment plant produced 2,376 Tons of CO<sub>2</sub> from its electricity use. The plant also benefits from an abundance of available land surrounding the plant.

## ASSUMPTIONS

For on-site power productions, we have looked at Lane Electric's policies. They have a net metering policy for solar systems 25kW and under but no specific carveout for systems above that. We will assume in this policy that there will be no specific exceptions to that policy for the wastewater treatment plant.

The lowest monthly electrical usage is listed as 28,000kWh. Assuming even power distribution throughout the day, this gives us a 39kW average electrical draw on months with the least demand.

The population of Oakridge has not fallen below 3.1 thousand residents since 1970, so we can assume it will remain steady for the foreseeable future. This means the energy demand will remain the same, and the tax revenue allocation will remain stable.

## CAPITAL PLANNING ALTERNATIVES

Our group has discussed three policy options as detailed below:

- 1. Business as usual** – If no funding exists to add power generation to the Wastewater Treatment facility, then power can continue to be purchased from Lane Electric.
- 2. A small PV array** – A small array is added west of the biosolids pool, with the space available inside the fence line.
- 3. A distributed PV system** – Lane Electric's net metering policy allows for up to a 25kW system attached to any metered building. In this proposal, we would recommend installing multiple 25kW systems on buildings the city owns to create a distributed system that can gain the benefit of the net metering policy.

### Business as Usual

- **Minimizes environmental risks** - This was rated as low. Power provided by Lane Electric is associated with a low but significant amount of greenhouse gas production. This policy solution makes no effort to fix that.
- **Adaptive to changing technology and/or growth** – This was rated as medium. With no PV array installed, they could more easily incorporate future EV technology into the wastewater treatment facility.

- **Economic efficiency** - The long-term economic efficiency of business as usual is low due to the rising cost of power in Oregon.
- **Resiliency to natural or man-made disasters** - The state of on-site power production will not affect resiliency to natural or man-made disasters.

#### Small PV Array

- **Minimizes environmental risks** - This was rated as Medium. A small PV array will reduce total greenhouse gas emissions on site due to the reduced commercial energy use.
- **Adaptive to changing technology and/or growth** – This was rated as low. If new PV technology came out in the next 20 years, the presence of a PV array connected to the wastewater treatment facility may impede adapting to that technology.
- **Economic efficiency** – The long-term economic efficiency is rated as high. A simple, small PV array will have the quickest repayment and then will continue to generate revenue for the city.
- **Resiliency to natural or man-made disasters** -The use of a small PV array does not have an impact on resilience to natural or manmade disasters. Solar PV is not reliable enough to be considered a backup power source for critical infrastructure like a wastewater treatment facility.

#### Distributed PV System

- **Minimizes environmental risks** - This was rated as High. A distributed PV system will allow for a larger installation of panels without the need for a costly battery system. This further

reduces greenhouse gas production from the amounts for a small, localized PV array.

- **Adaptive to changing technology and/or growth** – This was rated as low. If new PV technology came out in the next 20 years, the presence of a PV array connected to numerous buildings may impede adapting to that technology at all those sites
- **Economic efficiency** – The long-term economic efficiency is rated as medium. A distributed system is multiple small PV arrays. There is added cost for working at multiple sites and making multiple connections. It also excludes those sites from installing PV arrays for their own economic efficiency.
- **Resiliency to natural or man-made disasters** - The state of on-site power production will not affect resiliency to natural or man-made disasters. Solar PV is not reliable enough for critical infrastructure like a wastewater treatment facility and can't be considered to raise resiliency.

### RECOMMENDED COURSE OF ACTION

We recommend installing a small PV array on site due to the project's economic efficiency. Given the current wastewater treatment facility's lowest monthly electricity usage, as stated in our assumptions, and understanding the constraints of Lane Electric's net metering program, we recommend a 40kW PV array. This array may return very small amounts of energy to the grid during the months with the least possible demand, but is the largest array possible where the facility will use virtually all of the electricity

produced by the PV array. This array would consist of 100 panels arranged in 10 rows of 10 on the northwest corner of the property. Each panel would be rated at 400 watts.

This project would require the removal of both trees inside the fence line on the west end of the sludge pond to prevent shadows on the array and minimize cleaning and debris cleanup.

FIG. 8



Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Construction	1,4		\$120,000				\$120,000.00
Upkeep/Maintenance	4			\$200	\$200	\$200	\$600.00
Other							
<b>TOTALS:</b>		0	\$120,000	\$200	\$200	\$200	\$120,600.00
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 12**

The construction costs are based on a \$3 per watt estimate created for the Oakridge WAC solar project. Ongoing maintenance costs are based on man-hours for minor cleaning and debris pickup. Later in the life of the solar array, the maintenance costs may rise to replace inverters or other components that fail.

During the Biden-Harris administration, the Inflation Reduction Act passed through Congress. This provided numerous infrastructure opportunities, especially for rural and low-income populations. The solar tax credit created through this program can fund up to 30% of a solar energy project. Unlike previous tax credit programs, a direct pay option for non-profit and public institutions was created so that they could take part in the opportunity. The Trump administration has added some confusion over the availability of this funding by issuing an executive order pausing funding through the Inflation Reduction Act. The Office

of Management and Budget released a statement that the pause would not affect the solar energy tax credit, but Oakridge will need to continue to monitor the program leading up to the decision to go forward with the project.

The Oregon Department of Energy has numerous programs to fund solar projects and to provide low-interest loans to public organizations to implement solar energy projects. Recent examples are the Small-Scale Local Energy Loan Program, the Oregon Solar and Storage Rebate Program, and the Community Renewable Energy Grant. The loan program is currently available and could be an option to fund the solar program, with the savings from reduced energy bills being used to pay the debt service. More solar grant programs will likely be available in Oregon in the future, and Oakridge will need to continue to monitor for ODE for as these opportunities are made available.

# Infiltration/Inflow Assessment

## INTRODUCTION

The Oakridge Wastewater Treatment Facility experiences seasonal shifts in the quantity of flow into the facility due to inflow and infiltration from groundwater and stormwater. During summer, the facility experiences as little as 100k – 200k gallons per day and can experience over 3 million gallons per day during the rainy season. The facility is designed for 1 million Gallons per Day flow rate, and after exceeding that, it must reduce treatment times for each batch in order to process the water.

## ASSUMPTIONS

This analysis assumes that the I&I study conducted by Pace Engineers in 2009 is still relevant. Oakridge has identified the work they have completed, but most of the identified areas still require repairs.

## CAPITAL PLANNING ALTERNATIVES

We are providing two capital planning alternatives for consideration.

1. Business as Usual. In this option, the city corrects problems as there are convenient opportunities to access problematic wastewater piping throughout town. This option represents a lack of funding to tackle the much larger project of creating significant reductions in flow at the wastewater treatment facility.
2. The city aggressively pursues grants to perform the work listed in the 2009 I&I study that correlates to 70-80% stormwater infiltration.

## EVALUATION CRITERIA

	Minimizes Environmental Risk	Adaptive to changing technology and/or Growth	Economic Efficiency	Resiliency to natural or manmade disasters
Business as Usual	Low	Normal	Low	Low
Largescale Repair Project	High	Normal	High	High

TABLE 13

### Business as Usual

- **Minimizes environmental risks** – This was rated as low due to the recent data from the Wastewater treatment plant. In December, due to a long period of high rain, flow at the treatment facility exceeded 3 million GPD. If no action is taken, the condition of the wastewater collection system continues to degrade, the flow will exceed the maximum ability for the plant to process water.
- **Adaptive to changing technology and/or growth** – The wastewater treatment system continues to be updated as needed with new technology to improve its ability to function.
- **Economic efficiency** – This was rated as low due to the wear on the system as a result of high levels of flow during the rainy season in Oakridge. That flow causes increased wear on all system components, including pumps, piping, UV bulbs, and blowers. Beyond the need for increased maintenance and replacement of components, the increased wear will also lead to the accelerated need to replace the Wastewater Treatment Facility.
- **Resiliency to natural or manmade disasters** – This was rated as low due to some of the other factors that can affect system reliability. The emergency generator for the wastewater treatment facility only powers a subset of pumps and blowers. On a loss of power, the system is limited in the amount of water that can be pumped through the system. If a large rain event coincided with a longer loss of power, the system wouldn't be able to process the large amount of water.

### Large Scale Repair Project

- **Minimizes environmental risks** – This was rated as high. This option reduces the winter influx of water to the wastewater treatment facility. It dramatically reduces the risk of significant rain events causing excessive water and the inability to treat incoming wastewater.
- **Adaptive to changing technology and/or growth** – This was rated as normal. This focuses on repairs to the current system and doesn't expand the system's ability to adapt to new technology.
- **Economic efficiency** – This option has a high. This has a high initial cost but results in much lower maintenance costs and a longer wastewater treatment plant replacement timeline.
- **Resiliency to natural or manmade disasters** – This was rated as high. The reduction in peak water flow to the plant dramatically reduces the chance for multiple events to coincide and overwhelm the wastewater treatment plant.

### RECOMMENDED COURSE OF ACTION

Based on the criteria matrix, we recommend aggressively pursuing grants for a large-scale wastewater collection system repair project. The project should be focused on areas of most need first, as described in the 2009 I&I report up to and including all areas included in the urgent need section. The reduced flow will result in reduced maintenance and replacement of pumps and blowers, reduced electricity costs for the wastewater treatment facility, and UV bulbs lasting longer between replacements. Based on the 2009

engineering estimate of \$2,431,422 for repair of 70%-80% of water infiltration, and a 48% increase due to inflation from 2009 to 2025, I would estimate this project would now cost \$3,598,504. We will be recommending a piecemeal approach to addressing the areas covered by this \$3.6 million project in order to make the most use of grant funding.

Oregon’s Community Development Block Grant is the most applicable grant, with the most appropriate total project allocations for the work needed. For wastewater projects, it allows a project maximum of up to \$2.5 million dollars.

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Engineering (Meadow Way, 2nd St, 1st St East)	2	\$319,079					
Construction (Meadow Way, 2nd St, 1st St East)	2		\$713,824	\$881,573			
Engineering (1st St West, south of Railroad Tracks)	2			\$279,819			
Construction (1st St West, south of Railroad Tracks)	2				\$790,561	\$608,535	
Other							
<b>TOTALS:</b>		\$319,079	\$713,824	\$1,161,392	\$790,561	\$608,535	\$3,593,395
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 14**

This plan allows for one year of engineering planning and 2 years of construction for each section of the determined sections of the city.

**Section 1**

- Meadow Way from Roberts Rd. to the West Oak Rd./High Leah Dr. intersection
- 2nd Street from Alder to Pine St
- 1st Street from Elm St. to Maple St.

**Section 2**

- 1st St & Commercial St. from Cherry St. to Laurel St.
- C30-C29
- C29-C28
- C33-C32
- C32-C27
- C7-C6
- C27-C1

**CAPITAL PROJECT REQUEST: BUILDING ENERGY UPGRADES**

**Department:** Public Works

**Request Category:** Renovation

**Project Location:** City Hall

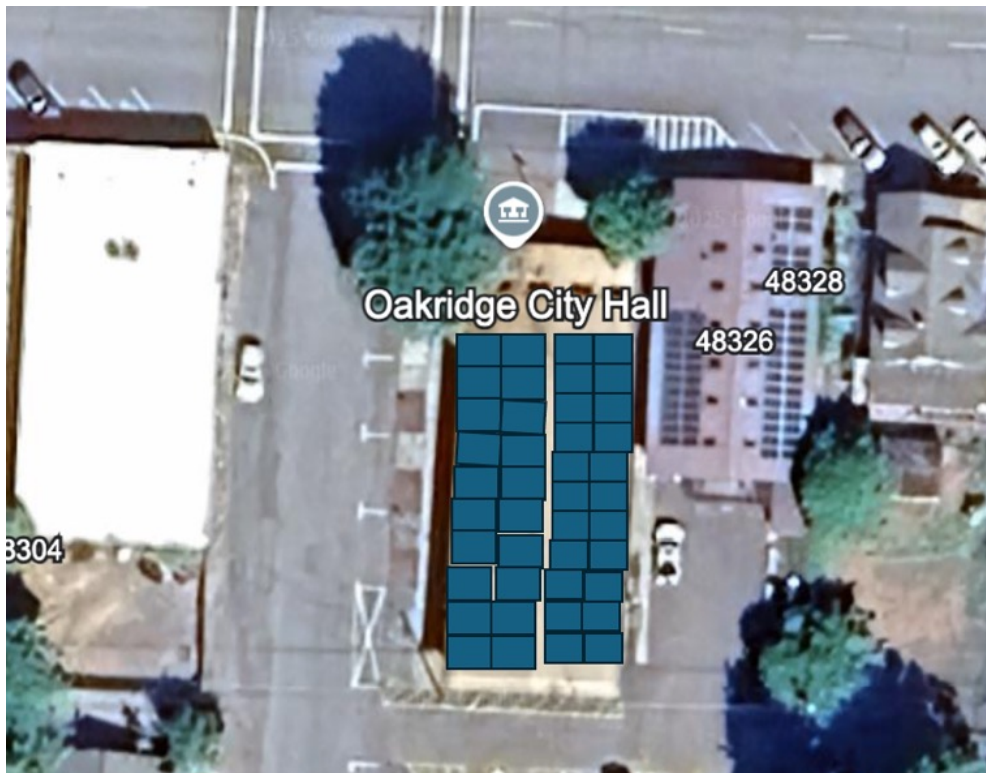


FIG. 9

## PROJECT DESCRIPTION

The City of Oakridge public buildings have received piecemeal updates to energy efficiency. This plan includes the immediate improvements needed and suggested improvements based on an ROI model. Only projects over \$20,000 are included in the budgeting section. Addendum 1 of this document has an itemized list of needed energy efficiency updates to buildings below this threshold.

Many of the City Hall building's needed updates fall below the \$20,000 threshold. Rooftop solar will be included in the five-year capital plan, and we have selected a 25kW system for this project to take advantage of Lane Electric's net metering policy.

## PROJECT JUSTIFICATION

Based on the 2024 calendar year electrical usage shown in Addendum 2, the city hall building consumes 54,300 kWh annually. Adding a 25 kW rooftop PV system would provide approximately 55% of the building's electrical needs, or 30,000 kWh, based on a 1,200kWh/kw for the Oakridge area. The cost of this system is estimated at \$75,000, based on an average cost of \$3 per watt for Oregon solar installations.

In February of 2025, the usage rate increased from \$0.0678/kWh to \$0.0715/kWh, a \$0.0037/kWh increase in cost. Assuming this increase will continue each year, this project would see a full return on

investment after 22 years. A table of yearly and total savings is available in Addendum 2.

During the Biden-Harris administration, the Inflation Reduction Act passed through Congress. This provided numerous infrastructure opportunities, especially for rural and low-income populations. The solar tax credit created through this program can fund up to 30% of a solar energy project. Unlike previous tax credit programs, a direct pay option for non-profit and public institutions was created so that they could take part in the opportunity. The Trump administration has added some confusion over the availability of this funding by issuing an executive order pausing funding through the Inflation Reduction Act. The Office of Management and Budget released a statement that the pause would not affect the solar energy tax credit. If Oakridge was able to make use of this program, it could reduce the full return on investment to 17 years. If future state solar grant funding was released, the full return on investment could be reduced further.

This project is projected to begin as soon as possible. The roof condition should be assessed, and if there are less than 20 years of useful life left for the roof, then the project timeline should be reassessed to see if it can coincide with a future replacement of the roof.



FIG. 10

### PROJECT COST AND PROPOSED FINANCING

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Construction	1,2	\$75,000					\$75,000
Upkeep/Maintenance	1		\$50	\$50	\$50	\$50	\$200
<b>TOTALS:</b>							\$75,200
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

TABLE 15

## NOTES

- The city hall front entry area has updated doors with double-pane glass. However, the large windows above the doors are single-pane and will allow heat transfer, reducing the building's efficiency.
- Electric wall heaters are present in some offices that have not been updated with a heat pump system. These heaters are very inefficient and should be replaced with a heat pump.
- The hot water heater runs off a mechanical timer. Currently, that timer is set for continuous operation. By turning off the hot water heater when the building is not occupied and turning it on 30 minutes to 1 hour before it is reoccupied, the city can save energy and reduce utility costs.
- The ductless heat pumps installed throughout the building have an optional wired controller that can be installed to incorporate motion sensors or scheduling via a phone app. This would allow greater control over heating and cooling and reduce utility use.
- The back hallway exit door has a visible gap between the bottom of the door and the threshold. Adding a door sweep will reduce air exchange with the outside of the building.
- Many of the lights throughout the building have been updated to LED. That process should continue to include lights around the perimeter of the building.

### COST SAVING ESTIMATES

Year	Usage Rate (\$/ kWh)	Annual Savings	Total Savings
2025	0.0715		
2026	0.0752	\$ 2,256.00	\$ 2,256.00
2027	0.0789	\$ 2,367.00	\$ 4,623.00
2028	0.0826	\$ 2,478.00	\$ 7,101.00
2029	0.0863	\$ 2,589.00	\$ 9,690.00
2030	0.09	\$ 2,700.00	\$ 12,390.00
2031	0.0937	\$ 2,811.00	\$ 15,201.00
2032	0.0974	\$ 2,922.00	\$ 18,123.00
2033	0.1011	\$ 3,033.00	\$ 21,156.00
2034	0.1048	\$ 3,144.00	\$ 24,300.00
2035	0.1085	\$ 3,255.00	\$ 27,555.00
2036	0.1122	\$ 3,366.00	\$ 30,921.00
2037	0.1159	\$ 3,477.00	\$ 34,398.00
2038	0.1196	\$ 3,588.00	\$ 37,986.00
2039	0.1233	\$ 3,699.00	\$ 41,685.00
2040	0.127	\$ 3,810.00	\$ 45,495.00
2041	0.1307	\$ 3,921.00	\$ 49,416.00
2042	0.1344	\$ 4,032.00	\$ 53,448.00
2043	0.1381	\$ 4,143.00	\$ 57,591.00
2044	0.1418	\$ 4,254.00	\$ 61,845.00
2045	0.1455	\$ 4,365.00	\$ 66,210.00
2046	0.1492	\$ 4,476.00	\$ 70,686.00
2047	0.1529	\$ 4,587.00	\$ 75,273.00
2048	0.1566	\$ 4,698.00	\$ 79,971.00

TABLE 16

Month	Usage (kWh)
Jan	5760
Feb	4920
Mar	5040
Apr	4020
May	3900
Jun	3840
Jul	4740
Aug	4080
Sep	3720
Oct	3960
Nov	4260
Dec	6060
Total	54300

TABLE 17

## CAPITAL PROJECT REQUEST: BUILDING ENERGY UPGRADES

**Department:** Public Works

**Request Category:** Renovation

**Project Location:** Oakridge Industrial Park

FIG. 11



## PROJECT DESCRIPTION

The City of Oakridge public buildings have received piecemeal updates to energy efficiency. This plan includes the immediate improvements needed and suggested improvements based on an ROI model. Only projects over \$20,000 are included in the budgeting section. Addendum 1 of this document has an itemized list of needed energy efficiency updates to buildings below this threshold.

Many of the OIP office building's needed updates fall below the \$20,000 threshold. Rooftop solar will be included in the five-year capital plan, and we have selected a 25kW system for this project to take advantage of Lane Electric's net metering policy.

## PROJECT JUSTIFICATION

Based on the 2024 calendar year electrical usage shown in Addendum 2, the OIP office building consumes 35,707 kWh annually. Adding a 25 kW rooftop PV system would provide approximately 84% of the building's electricity needs, or 30,000 kWh, based on a 1,200kWh/kw for the Oakridge area. The cost of this system is estimated at \$75,000, based on an average cost of \$3 per watt for Oregon solar installations.

In February of 2025, the usage rate increased from \$0.0678/kWh to \$0.0715/kWh, a \$0.0037/kWh increase in cost. Assuming this increase will continue each

year, this project would see a full return on investment after 22 years. A table of yearly and total savings is available in Addendum 2.

During the Biden-Harris administration, the Inflation Reduction Act passed through Congress. This provided numerous infrastructure opportunities, especially for rural and low-income populations. The solar tax credit created through this program can fund up to 30% of a solar energy project. Unlike previous tax credit programs, a direct pay option for non-profit and public institutions was created so that they could take part in the opportunity. The Trump administration has added some confusion over the availability of this funding by issuing an executive order pausing funding through the Inflation Reduction Act. The Office of Management and Budget released a statement that the pause would not affect the solar energy tax credit. If Oakridge was able to make use of this program, it could reduce the full return on investment to 17 years. If future state solar grant funding was released, the full return on investment could be reduced further.

This project is projected to begin as soon as possible. The roof condition should be assessed, and if there are less than 20 years of useful life left for the roof, then the project timeline should be reassessed to see if it can coincide with a future replacement of the roof.

## PROJECT COST AND PROPOSED FINANCING

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Construction	1,2	\$75,000					\$75,000
Upkeep/Maintenance	1		\$50	\$50	\$50	\$50	\$200
TOTALS:							\$75,200
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

TABLE 18



FIG. 12

### NOTES

- Replace the aging hot water heater. The hot water heater should be relocated inside, and under-sink tankless water heaters should be considered.
- Single-pane windows should be replaced with double-pane windows to reduce heat loss from the building.
- Ductless heat pumps should be added to any space currently served by an electric baseboard heater. The baseboard heaters do not necessarily need to be removed but the setpoint should be adjusted so that they only run if the ductless system has failed.
- LED lighting replacements should continue to be prioritized to reduce electricity consumption.

### COST SAVING ESTIMATES

Year	Usage Rate (\$/ kWh)	Annual Savings	Total Savings
2025	0.0715		
2026	0.0752	\$ 2,256.00	\$ 2,256.00
2027	0.0789	\$ 2,367.00	\$ 4,623.00
2028	0.0826	\$ 2,478.00	\$ 7,101.00
2029	0.0863	\$ 2,589.00	\$ 9,690.00
2030	0.09	\$ 2,700.00	\$ 12,390.00
2031	0.0937	\$ 2,811.00	\$ 15,201.00
2032	0.0974	\$ 2,922.00	\$ 18,123.00
2033	0.1011	\$ 3,033.00	\$ 21,156.00
2034	0.1048	\$ 3,144.00	\$ 24,300.00
2035	0.1085	\$ 3,255.00	\$ 27,555.00
2036	0.1122	\$ 3,366.00	\$ 30,921.00
2037	0.1159	\$ 3,477.00	\$ 34,398.00
2038	0.1196	\$ 3,588.00	\$ 37,986.00
2039	0.1233	\$ 3,699.00	\$ 41,685.00
2040	0.127	\$ 3,810.00	\$ 45,495.00
2041	0.1307	\$ 3,921.00	\$ 49,416.00
2042	0.1344	\$ 4,032.00	\$ 53,448.00
2043	0.1381	\$ 4,143.00	\$ 57,591.00
2044	0.1418	\$ 4,254.00	\$ 61,845.00
2045	0.1455	\$ 4,365.00	\$ 66,210.00
2046	0.1492	\$ 4,476.00	\$ 70,686.00
2047	0.1529	\$ 4,587.00	\$ 75,273.00
2048	0.1566	\$ 4,698.00	\$ 79,971.00

TABLE 19

Month	Usage (kWh)
Jan	5492
Feb	4311
Mar	4451
Apr	3049
May	1224
Jun	2143
Jul	1523
Aug	1258
Sep	1217
Oct	2266
Nov	3415
Dec	5358
Total	35707

TABLE 20

## CAPITAL PROJECT REQUEST: BUILDING ENERGY UPGRADES

**Department:** Public Works

**Request Category:** Renovation

**Project Location:** Public Works Shop

FIG. 13



## PROJECT DESCRIPTION

The City of Oakridge public buildings have received piecemeal updates to energy efficiency. This plan includes the immediate improvements needed and suggested improvements based on an ROI model. Only projects over \$20,000 are included in the budgeting section. Addendum 1 of this document has an itemized list of needed energy efficiency updates to buildings below this threshold.

Many of the Public Works Shop building's needed updates fall below the \$20,000 threshold. Rooftop solar will be included in the five-year capital plan, and we have selected a 25kW system for this project to take advantage of Lane Electric's net metering policy.

## PROJECT JUSTIFICATION

Based on the 2024 calendar year electrical usage shown in Addendum 2, the Public Works shop building consumes 36,800 kWh annually. Adding a 25 kW rooftop PV system would provide approximately 81% of the building's electrical needs, or 30,000 kWh, based on a 1,200kWh/kw for the Oakridge area. The cost of this system is estimated at \$75,000, based on an average cost of \$3 per watt for Oregon solar installations.

In February of 2025, the usage rate increased from \$0.0678/kWh to \$0.0715/kWh, a \$0.0037/kWh increase in cost. Assuming this increase will continue each

year, this project would see a full return on investment after 22 years. A table of yearly and total savings is available in Addendum 2.

During the Biden-Harris administration, the Inflation Reduction Act passed through Congress. This provided numerous infrastructure opportunities, especially for rural and low-income populations. The solar tax credit created through this program can fund up to 30% of a solar energy project. Unlike previous tax credit programs, a direct pay option for non-profit and public institutions was created so that they could take part in the opportunity. The Trump administration has added some confusion over the availability of this funding by issuing an executive order pausing funding through the Inflation Reduction Act. The Office of Management and Budget released a statement that the pause would not affect the solar energy tax credit. If Oakridge was able to make use of this program, it could reduce the full return on investment to 17 years. If future state solar grant funding was released, the full return on investment could be reduced further.

This project is projected to begin as soon as possible. The roof condition should be assessed, and if there are less than 20 years of useful life left for the roof, then the project timeline should be reassessed to see if it can coincide with a future replacement of the roof.

### PROJECT COST AND PROPOSED FINANCING

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Construction	1,2	\$75,000					\$75,000
Upkeep/Maintenance	1		\$50	\$50	\$50	\$50	\$200
TOTALS:							\$75,200
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

TABLE 21

#### NOTES

- The replacement of lights with LEDs throughout the building should continue to be prioritized.
- Controls for lighting and building heat should be considered where appropriate to ensure that utilities are not being used while the building is not occupied.

### COST SAVING ESTIMATES

Year	Usage Rate (\$/kWh)	Annual Savings	Total Savings
2025	0.0715		
2026	0.0752	\$ 2,256.00	\$ 2,256.00
2027	0.0789	\$ 2,367.00	\$ 4,623.00
2028	0.0826	\$ 2,478.00	\$ 7,101.00
2029	0.0863	\$ 2,589.00	\$ 9,690.00
2030	0.09	\$ 2,700.00	\$ 12,390.00
2031	0.0937	\$ 2,811.00	\$ 15,201.00
2032	0.0974	\$ 2,922.00	\$ 18,123.00
2033	0.1011	\$ 3,033.00	\$ 21,156.00
2034	0.1048	\$ 3,144.00	\$ 24,300.00
2035	0.1085	\$ 3,255.00	\$ 27,555.00
2036	0.1122	\$ 3,366.00	\$ 30,921.00
2037	0.1159	\$ 3,477.00	\$ 34,398.00
2038	0.1196	\$ 3,588.00	\$ 37,986.00
2039	0.1233	\$ 3,699.00	\$ 41,685.00
2040	0.127	\$ 3,810.00	\$ 45,495.00
2041	0.1307	\$ 3,921.00	\$ 49,416.00
2042	0.1344	\$ 4,032.00	\$ 53,448.00
2043	0.1381	\$ 4,143.00	\$ 57,591.00
2044	0.1418	\$ 4,254.00	\$ 61,845.00
2045	0.1455	\$ 4,365.00	\$ 66,210.00
2046	0.1492	\$ 4,476.00	\$ 70,686.00
2047	0.1529	\$ 4,587.00	\$ 75,273.00
2048	0.1566	\$ 4,698.00	\$ 79,971.00

TABLE 22

Month	Usage (kWh)
Jan	3400
Feb	3520
Mar	3320
Apr	2840
May	3040
Jun	2680
Jul	3000
Aug	3040
Sep	2720
Oct	2400
Nov	2640
Dec	4200
Total	36800

TABLE 23

## CAPITAL PROJECT REQUEST: STREET MAINTENANCE

**Department:** Public Works

**Request Category:** Upkeep/Maintenance

**Project Location:** Town of Oakridge

FIG. 14



### PROJECT DESCRIPTION

The city of Oakridge has historically used a fuel dealer licensing fee to fund minor street repair and received funding from ODOT for major street improvements. As roads require preservation every 10-15 years (with a total lifespan of 50 years), it is essential that supplemental funding sources are found as the current methods of funding are not likely to be renewed in the 2025-2026 fiscal year. To cover the deficit left by the expiration of funding sources, \$250,000.00 should be cut from other Oakridge budget resources or procured from outside grant funding. Ultimately, the focus surrounding roads should be on future maintenance costs and how they will be covered by alternative sources of funding. Below we have identified potential methods of

supplemental funding that may be used to fill this identified gap left by the end of the ODOT grant funding.

### PROJECT JUSTIFICATION

This project is essential for multiple reasons:

- Funding minor and major street repair and improvements is better economically. Preventative maintenance, such as minor repairs to potholes or cracks in the asphalt, is much cheaper than full reconstruction. Further, reasonable, reliable roads improve access to places around Oakridge, especially for local businesses that rely on the roads to boost their economic growth

- Funding minor and major street repair and improvements is safer. Bad roads (those with potholes, cracks, and uneven pavement) increase the risk of accidents for everyone (drivers, cyclists, and pedestrians). Further, smooth, safe roads allow for faster emergency response as the streets are easier to navigate and safer to increase speed
- Funding minor and major street repair and improvements promotes infrastructure longevity. Continual maintenance prolongs the life of the road and hence prolongs the value of the investment. Investing in significant improvements builds a lasting infrastructure legacy.
- Funding minor and major street repair and improvements increases the community's quality of life.

With better, safer, and more reliable roads, there is less vehicle damage and better traffic flow. These two things are very noticeable to citizens when they are going poorly.

Given the need for a 27% reduction within the City of Oakridge's budget, it is important to reevaluate the different street funding and the priorities that are revolving around it. This will help ensure the level of safety and needs for the community are being met while at the same time acknowledging the financial limitations. The scope doesn't prioritize general upkeep for the streets. There needs to be more priority on preserving public safety, through targeted interventions that address the many different hazard conditions, traffic safety, and enhancing pedestrian/ bicycle safety. To bridge this funding gap, budget cuts are necessary unless the city can reserve funds to be allocated.

There needs to be \$249,970 redacted from the budget in order to solve the lack of ODOT apportionments, it is imperative to reassess street funding to help balance financial realities with the infrastructure needs. Numerous grants can help support this project can't be fully reliant on grants alone, so making the necessary cuts while also supplementing other future projects with some external funding would be beneficial

### PROPOSED FINANCING

To solve the lack of ODOT apportionments, we have proposed the following grants and long-term financial stability plan, which will be critical if reserved funds for future expenditure cannot be used to cover the gap. That said, we have also outlined recommended cuts that would allow the Streets to break-even.

### PROPOSED GRANTS

If the suggested cuts aren't possible to the extent of \$250,000 with respect to requirements or planned capital improvement, other possible sources of revenue include the following grants. It should however be noted that these grants will not provide immediate solutions, and so planning should rely on how to make present cuts with the hope of supporting future projects through these funds.

#### ODOT

- STIP
  - » Next funding pool for 2027-2030
  - » Fix-It Programs, Safety Programs, Non-Highway Programs, Local Government programs
- ODOT Immediate Opportunity Fund

#### DOT

- Discretionary Grants

## LONG-TERM FINANCIAL CONSIDERATIONS

While these suggestions may prove useful in the short term, there are other considerations, particularly should access to grants diminish over the next few years. To address these gaps, we have outlined a three step timeline for immediate needs, mid term needs, and long term needs, to encourage more financial stability.

## PHASED FUNDING STRATEGY

### 1. Immediate (FY26–FY27)

- Implement a Transportation Utility Fee (\$5–\$10/month per household).
  - » This could be enacted as a local city tax, particularly retailed to continue support for local businesses.
- Prioritize grant acquisition with a dedicated team or consultant.
  - » See recommended grants
- Push for General Fund transfers to temporarily bridge the ODOT gap.
  - » Assess what emergency funds are available, compared to the short-term needs of the department. As travel is critical for many people, particularly in Oakridge which is reliant on access to other cities, this should be seen as an urgent need.

### 2. Mid-Term (FY28–FY29)

- Explore bond measures for larger capital improvements.
  - » Consider increasing taxes for a short term (say 5 years) to bridge needs, directed at the most urgent projects. These should be capital investments, whose primary costs have fixed timelines, with upkeep folded into the Street operating budget.
- Consider a local fuel tax increase to stabilize the Street Fund.
  - » This will require an assessment of what people are likely to

find permissible, as well as an assessment of fuel options outside of local purview.

- Leverage public-private partnerships for road maintenance efficiency.
  - » Are there any funds Lane County can offer to bridge needs?

### 3. Long-Term (FY30 and Beyond)

- Fully phase in the utility fee for self-sustaining infrastructure funding.
- Use surplus funds to build a road repair reserve for future needs.
  - » Current surplus exists. Identify current needs and allowed uses, with what may need to be allowed in the future.
- Conduct regular cost-benefit analyses to optimize repair cycles

## PROPOSED CUTS

We have outlined our proposed below. Current proposed cuts target the largest costs in the budget, with a particular focus on fixed-term uses. There are:

- Materials & Supplies (cut 20%)
- Capital Outlay
- Unappropriated funds

That said, should the budget allow, we would also recommend assessing:

### Professional Services

- Can these services be conducted by existing personnel or partially folded into other budgets?
- Contingency Funds
  - » Could these be used for the circumstances experienced (i.e. loss in expected grant income)?
  - » This would only be for the current fiscal year, as you address the new financial planning steps recommended.

	Historical Data	Description Resources and Requirements	Budget FY 2026-2027	
	Adopted Budget 2023-2024	Resources	Proposed by UO	Notes
1	\$ 299,145.00	Net Working Capital	\$ 299,145.00	
2	\$ -	Transfers from Gen Fund	\$ -	
3		<b>Other Resources</b>		
4	\$ 261,331.00	ODOT Apportionments	\$ 11,331.00	Not guaranteed, removed
5	\$ 70,905.00	Fuel Dealer's License Fee	\$ 70,905.00	
6	\$ 10,000.00	State Highway Rest Area	\$ 10,000.00	
7	\$ 250,000.00	ODOT Small City Allotment	\$ 250,000.00	
8	\$ 3,162.00	LID #20	\$ 3,162.00	
9	\$ -	LID #21	\$ -	
10	\$ -	LID #19	\$ -	
11	\$ 8,967.00	MISC Income	\$ 8,967.00	
12	\$ -	PW Overhead	\$ -	
13	\$ 903,510.00	<b>Total resources</b>	\$ 653,510.00	
14		<b>Requirements</b>	\$ -	
15		<b>Personnel Services</b>	\$ -	
16	\$ 21,600.00	Health Insurance	\$ 21,600.00	
17	\$ 18,152.00	PERS	\$ 18,152.00	
18	\$ 64,179.00	Wages	\$ 64,179.00	
19	\$ 103,931.00	<b>Total Personnel Services</b>	\$ 103,931.00	Cannot limit current hires or benefits
20	0.8	Total Full-Time Equivalent (FTE)	0.8	Already reduced from 1.0
21		<b>Materials &amp; Services</b>		
22	\$ 179,000.00	Materials & Supplies	\$ 143,200.00	Reduced 20%
23	\$ 8,200.00	Utilities	\$ 8,200.00	
24	\$ 43,000.00	Professional Services	\$ 43,000.00	What professional services are these? Reduce if needed to appropriate funds for street improvement or Materials & Supplies.
25	\$ 48,280.00	Administrative Overhead	\$ 48,280.00	
26	\$ 1,000.00	Uniform Allowance	\$ 1,000.00	
27	\$ 10,000.00	Rest Area	\$ 10,000.00	
28	\$ 289,480.00	<b>Total Materials &amp; Services</b>	\$ 253,680.00	
29		<b>Capital Outlay</b>	\$ -	
30	\$ 250,000.00	Street Improvement	\$ 50,000.00	Reduced - Capital improvement not feasible
31	\$ 250,000.00	<b>Total Capital Outlay</b>	\$ 50,000.00	
32		<b>Interfund Transfers</b>	\$ -	
33		Transfer to Agency Fund	\$ -	
34		New Quipment	\$ -	
35		New Vehicle	\$ -	
36		<b>Total Interfund Transfers</b>	\$ -	
37	\$ 28,948.00	<b>Contingency</b>	\$ 28,948.00	
38	\$ 195,233.00	Reserved for Future Expenditure	\$ 195,233.00	
39		<b>Total Ending Fund Balance (prior Years)</b>	\$ 631,792.00	
40	\$ 35,918.00	Unappropriated Ending Fund Balance	\$ 21,718.00	Can this be reduced as this is the contingent situation?
41	\$ 903,510.00	<b>Total Requirements</b>	\$ 653,510.00	

TABLE 24

## CAPITAL PROJECT REQUEST: POTABLE WATER UPGRADES

**Department:** Public Works

**Request Category:** Renovation/Equipment Purchase

**Useful Life:** 50 to 70 years

**Project Location:** PW Well Field

FIG. 15



## PROJECT DESCRIPTION

The potable water distribution system for the city of Oakridge includes 6 active wells and piping that supplies potable water to the majority of the city residents. Only 2 of the wells are supplied with backup power through an onsite diesel generator, and all of the pump houses require roof replacements due to the removal of roofs for major well maintenance. Additionally, there may be a future state requirement to inspect potable water piping between the water meter and the residents house for any lead pipe that exists.

## PROJECT JUSTIFICATION

Cost Benefit/Analysis: Roof Replacement for all 6 pump houses

### Costs

Estimates costs are around \$25,000 per roof for a total of \$150,000

Could be reduced through contract changes based on square footage but have a general assumed cost per roof

### Benefits

1. Allows for more ease of access for pump maintenance or pumping via truck
2. Reduces risk of roof collapse or damage to wells due to roof damage
  - » Construction of new pump house and further maintenance from damage will run over \$500,000 plus
3. Keeps out further rainwater that could cause issues to the wells

**PROJECT COST AND PROPOSED FINANCING**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Land Acquisition							
Construction							
Equipment Purchase	Water Fund	\$150,000					\$150,000
Upkeep/Maintenance				\$1,000			\$1,000
Other		\$150,000		\$1,000			
<b>TOTALS:</b>		\$150,000		\$1,000			\$151,000
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

**TABLE 25**

# Appendix A

Cost Estimates for Non-Recommended Alternatives

### ALTERNATIVE PROPOSAL: BIOCHAR INSTALLATION

The table below is a detailed estimation of costs relating to the installation, operation, and maintenance of the biochar facility for five fiscal years. Each cost is broken into yearly expenses and the cost of the project for operations, and the Capital cost of installation is broken into 5-year installation costs. There may be an upfront cost on Capital cost depending on contracts meaning a 3,348,000 upfront charge for installation on Capital Cost. This does not include revenue generated by producing biochar or electricity for heating.

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Biochar facility maintenance	Waste fund	\$106,500	\$106,500	\$106,500	\$106,500	\$106,500	\$532,500
PYREG Service Contract	Waste fund	\$26,180	\$26,180	\$26,180	\$26,180	\$26,180	\$312,500
Personnel Cost	Waste fund	\$62,500	\$62,500	\$62,500	\$62,500	\$62,500	\$312,500
System Insurance	Waste fund	\$10,650	\$10,650	\$10,650	\$10,650	\$10,650	\$53,250
Utilities	Waste	\$54,225	\$54,225	\$54,225	\$54,225	\$54,225	\$271,125
Capital Cost	General Fund	\$669,600	\$669,600	\$669,600	\$669,600	\$669,600	\$3,348,000
<b>TOTALS:</b>		<b>\$929,655</b>	<b>\$929,655</b>	<b>\$929,655</b>	<b>\$929,655</b>	<b>\$929,655</b>	<b>\$4,648,275</b>
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

TABLE 1

**ALTERNATIVE PROPOSAL BACKUP POWER (BATTERY SUPPLY)**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Battery Purchase	Grants	\$0.00	\$425,000.00	\$0.00	\$0.00	\$0.00	\$425,000.00
Battery Purchase	Grants	\$0.00	\$425,000.00	\$0.00	\$0.00	\$0.00	\$425,000.00
Energy Costs	General	\$400.00	\$400.00	\$400.00	\$400.00	\$400.00	\$2,000.00
Upkeep/Maintenance	General	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$25,000.00
Other							
<b>TOTALS:</b>		\$5,400.00	\$430,400.00	\$5,400.00	\$5,400.00	\$5,400.00	\$452,000.00
Funding Sources:							
1) General Fund		5) Street Fund					
2) Grants		6) Oakridge Industrial Park Fund					
3) Water Fund		7) Debt					
4) Wastewater Fund		8) Other					

**TABLE 2****ALTERNATIVE PROPOSAL BACKUP POWER (BUSINESS AS USUAL)**

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Keeping Current Generator	General	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Energy Costs	General	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$200,000.00
Upkeep/Maintenance	General	\$300.00	\$300.00	\$300.00	\$300.00	\$300.00	\$1,500.00
Other							
<b>TOTALS:</b>		\$40,300.00	\$40,300.00	\$40,300.00	\$40,300.00	\$40,300.00	\$201,500.00
Funding Sources:							
1) General Fund		5) Street Fund					
2) Grants		6) Oakridge Industrial Park Fund					
3) Water Fund		7) Debt					
4) Wastewater Fund		8) Other					

**TABLE 3**

### ALTERNATIVE ONSITE POWER PRODUCTION (MULTI-SITE OPTION)

A distributed system will incorporate many 25kW arrays at multiple sites to meet the full electrical loading of the wastewater treatment facility. This was sized using the US Department of Energy’s PV watts model, which showed that a solar panel in Oakridge, Oregon would produce 1,200kWh/kW each year. Over the last year, the Wastewater treatment facility used just under 400MWhs of electricity. A 331kWs of PV panels would completely offset that amount. For our distributed system, we are recommending 13 separate 25kw systems, totaling 325kW of panels. We suggest completing this in 5 separate projects over the next 5 years.

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Land Acquisition							
Construction		\$225,000	\$225,000	\$225,000	\$225,000	\$75,000	\$975,000
Upkeep/Maintenance			\$100	\$200	\$300	\$300	\$900
Other							
<b>TOTALS:</b>		\$225,000	\$225,100	\$225,200	\$225,300	\$225,300	\$975,900
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

TABLE 4

### ALTERNATIVE PLAN COSTS (INFILTRATION/INFLOW)

#### Business as Usual

Below are the estimated maintenance costs over the next 5 years, assuming only normal city budget constraints.

Project/Activity:	Funding Source	Estimated Project Costs by Fiscal Year					Five-Year Total
		FY26	FY27	FY28	FY29	FY30	
Construction		\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$125,000
Other							
TOTALS:		\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$125,000
Funding Sources: 1) General Fund                      5) Street Fund 2) Grants                                6) Oakridge Industrial Park Fund 3) Water Fund                         7) Debt 4) Wastewater Fund                 8) Other							

TABLE 5

# Appendix B

Tables and Figures

Month	Usage (kWh)
Nov-23	32520
Dec-23	30720
Jan-24	36840
Feb-24	44040
Mar-24	40680
Apr-24	28320
May-24	27600
Jun-24	31920
Jul-24	33360
Aug-24	30360
Sep-24	28920
Oct-24	33000
Total	398280

TABLE 1

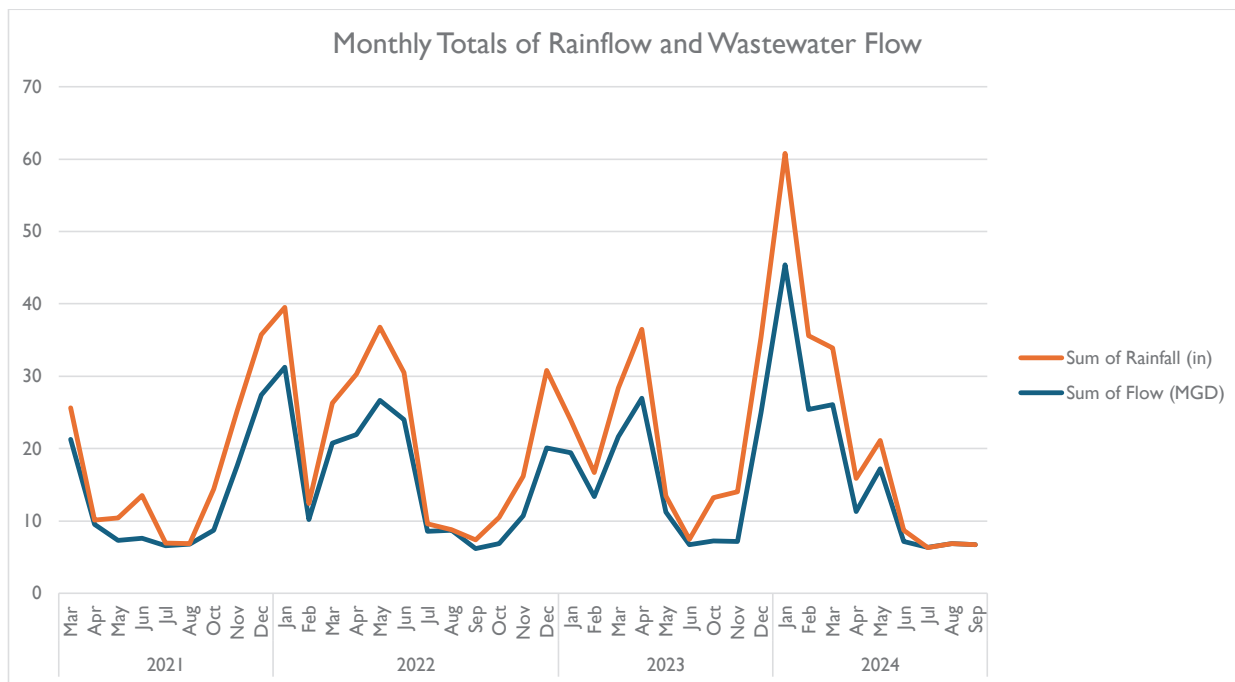


FIG. 1

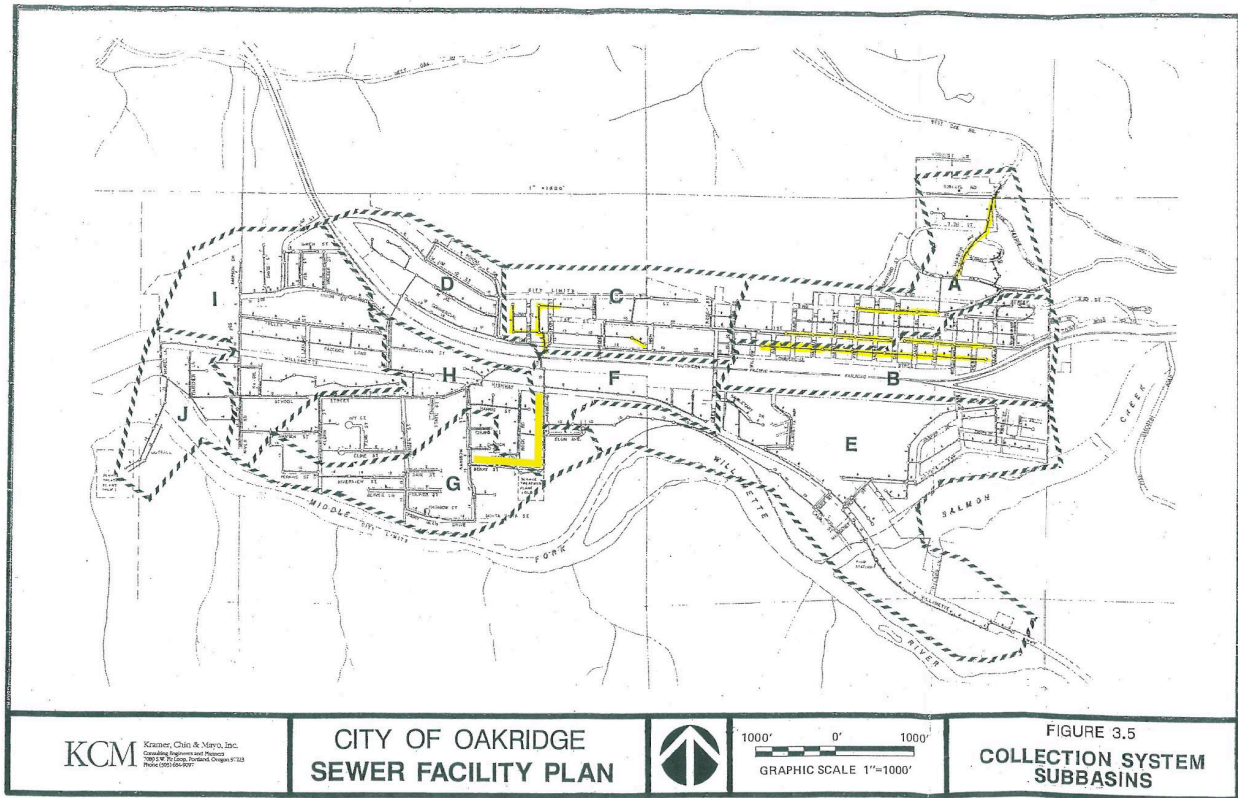


FIG. 2

## **SCI Directors and Staff**

Marc Schlossberg	SCI Co-Director, and Professor of Planning, Public Policy and Management, University of Oregon
Nico Larco	SCI Co-Director, and Professor of Architecture, University of Oregon
Megan Banks	SCYP Director, University of Oregon
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