Wastewater Treatment Plant Facilities Plan

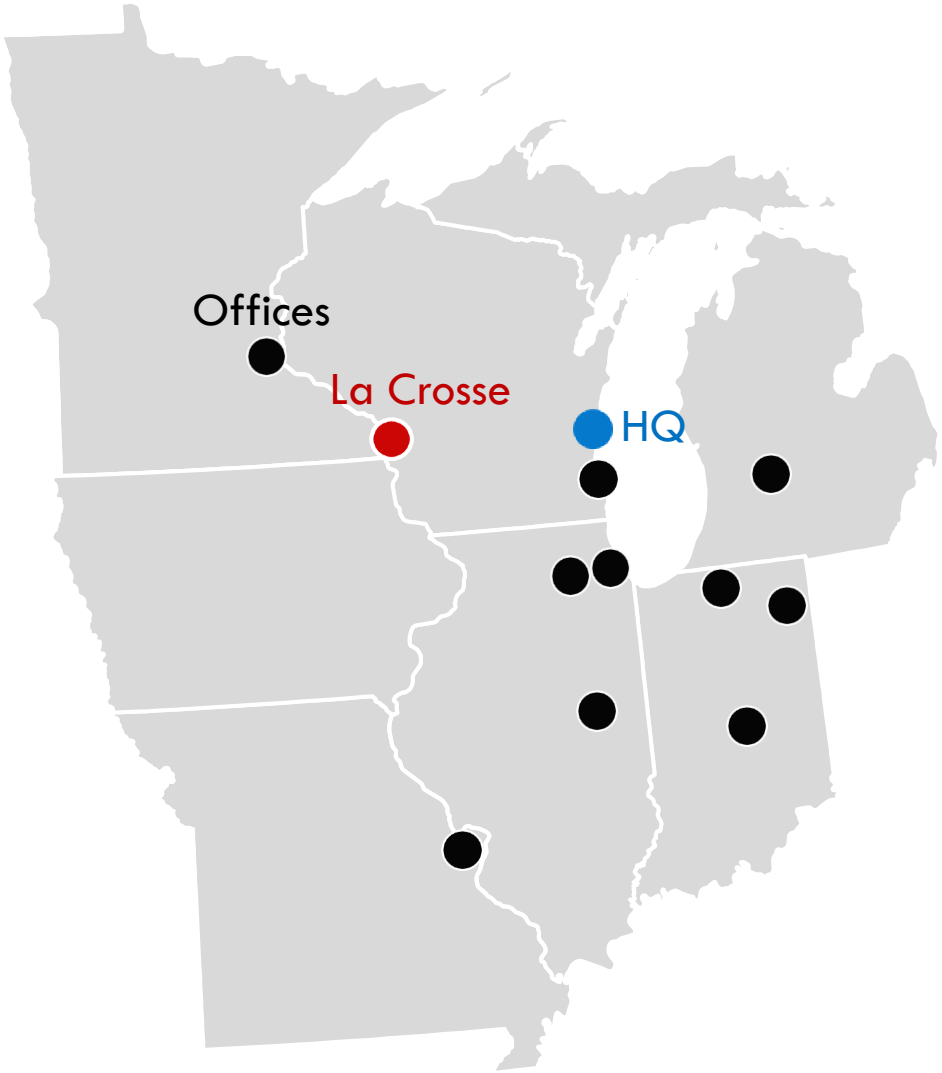
City Council
La Crosse, WI – City Hall

September 18, 2019

DONOHUE

Wastewater Consultant

Donohue is a Wisconsin-Based Water and Wastewater Specialty Firm



Exceptional expertise, specialization, and service to deliver sustainable solutions to wastewater infrastructure projects

Donohue is a Wisconsin-Based Water and Wastewater Specialty Firm

ENR TOP 500 SOURCEBOOK ENVIRONMENT

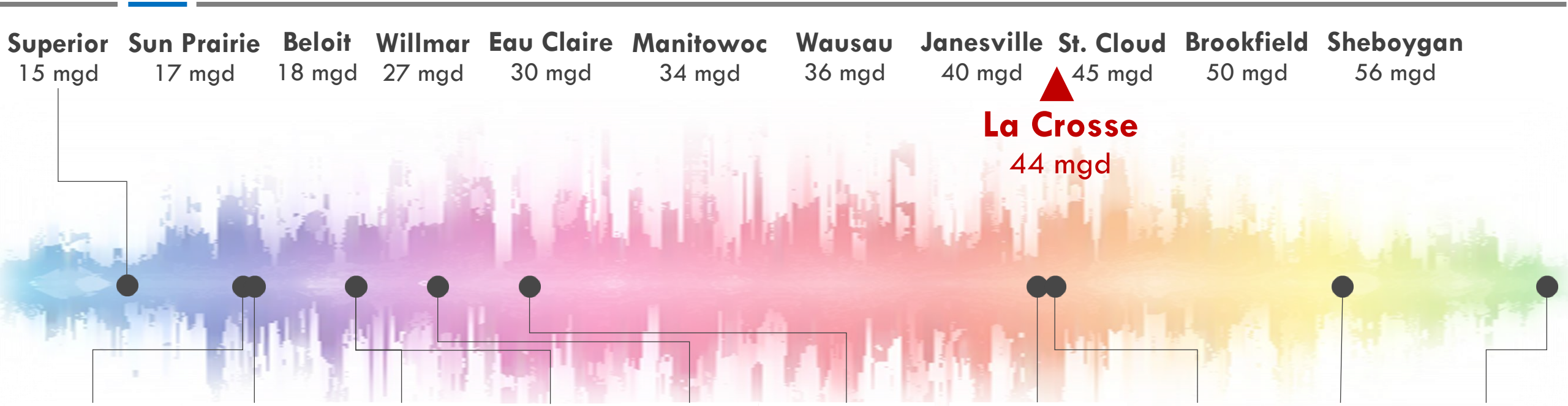
The Top Design Firms in Environment

WASTEWATER TREATMENT PLANTS

RANK	FIRM
17	DONOHUE & ASSOCIATES, INC.

enr.com 2019

Donohue Clients and Treatment Plants Span the Entire Capacity Spectrum



Superior
15 mgd

Sun Prairie
17 mgd

Beloit
18 mgd

Willmar
27 mgd

Eau Claire
30 mgd

Manitowoc
34 mgd

Wausau
36 mgd

Janesville
40 mgd

St. Cloud
45 mgd

Brookfield
50 mgd

Sheboygan
56 mgd

La Crosse
44 mgd

Naperville
65 mgd

Fond du Lac
66 mgd

St. Louis Coldwater
75 mgd

South Bend
77 mgd

Kenosha
100 mgd

Green Bay
100 mgd

Fort Wayne
100 mgd

Highland Park
100 mgd

Appleton
100 mgd

Joliet
100 mgd

Gary
120 mgd

Decatur
125 mgd

Waukegan
126 mgd

Indianapolis Southport
150 mgd

Duluth
160 mgd

St. Louis Bissell
300 mgd

Milwaukee South Shore
300 mgd

Indianapolis Belmont
300 mgd

Milwaukee Jones Island
330 mgd

Detroit
930 mgd

Chicago Stickney
1,400 mgd

Donohue and the City Have Been Developing this Plan for More Than a Decade

- 2008 Master Planning
- 2015 Phosphorus-Compliance Planning
- 2016 Capacity Re-Rating
- 2018 Facility Planning

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The City has been careful and deliberate developing the plan. It is now time to implement the plan.

City of La Crosse Wastewater Treatment Plant

The La Crosse Wastewater Treatment Plant

- Capacity
  - Average Flow
    - 10 million gallons per day
  - Peak Flow
    - 42.5 million gallons per day
    - 29,500 gallons per minute

The Plant Accepts and Cleans Wastewater from the La Crosse Service Area

- Produces Clean Water and Protects the Mississippi River
  - Disinfects
  - Removes Debris
    - Diapers, Hand Wipes, Sticks, Plastics
  - Removes Oxygen-Consuming Material
  - Removes Nutrients

WPDES Permit No. WI-0029581-09-0

WISCONSIN DEPT. OF NATURAL RESOURCES

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

City of La Crosse

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
905 Joseph Houska Drive
to
the Mississippi River in the Lower La Crosse River Watershed of the Bad Axe – La Crosse Rivers Basin located in La Crosse County

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary
By
Michael Vollrath
Wastewater Field Supervisor
December 7, 2015
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE - January 01, 2016 **EXPIRATION DATE - December 31, 2020**

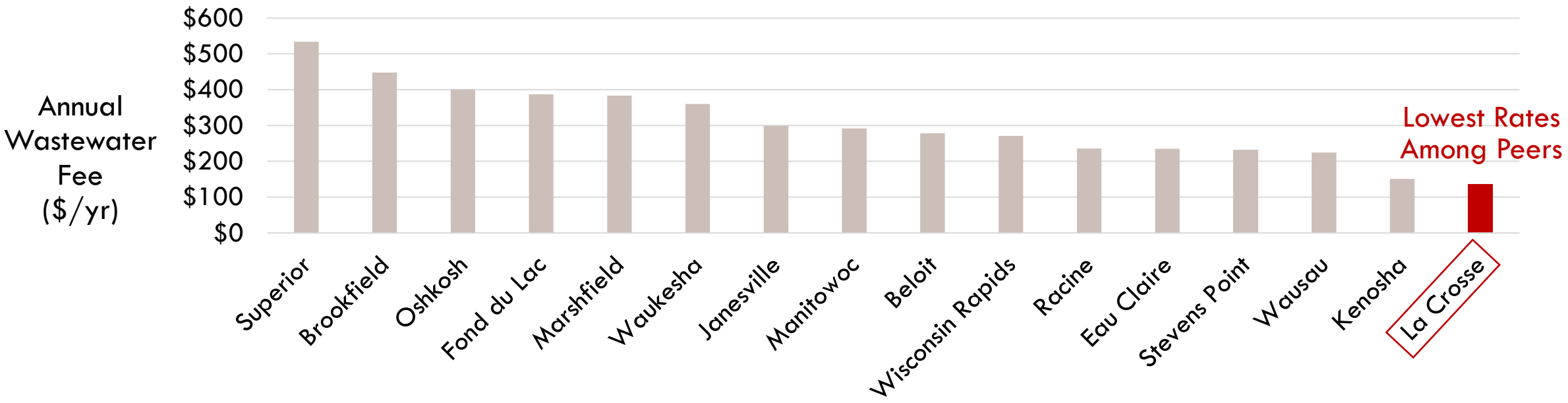
The Plant is One of the Most Valuable City-Owned Assets

- New Plant Would Cost in the Vicinity of $420M*

* Based on recent new 24-mgd nutrient-removing treatment facility for Denver, CO. Grand opening 2017. Cost = $417M.

The Plant Produces Clean Water Energy- and Cost-Effectively

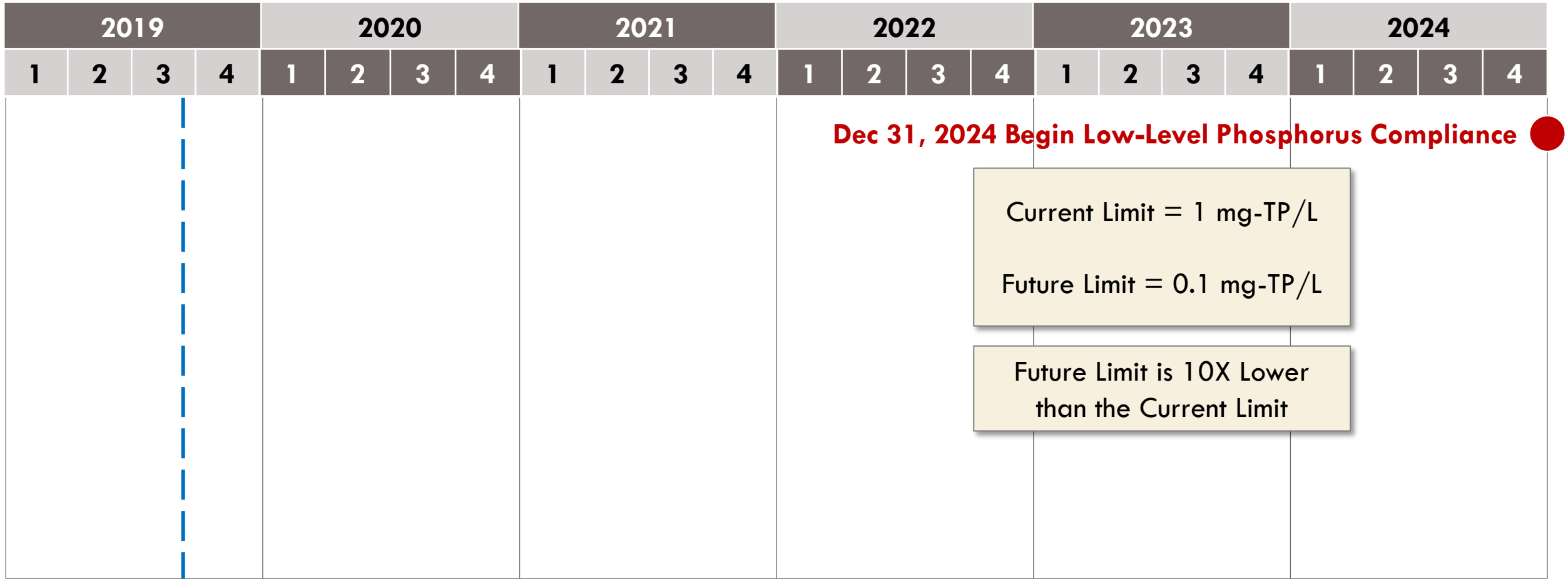
- Plant Performs Well and Efficiently
  - Consume 572 kWh/klb BOD Treated. One of the most energy-efficient in the State, 63% of the best-practices benchmark.



The Schedule Driver and Constraint

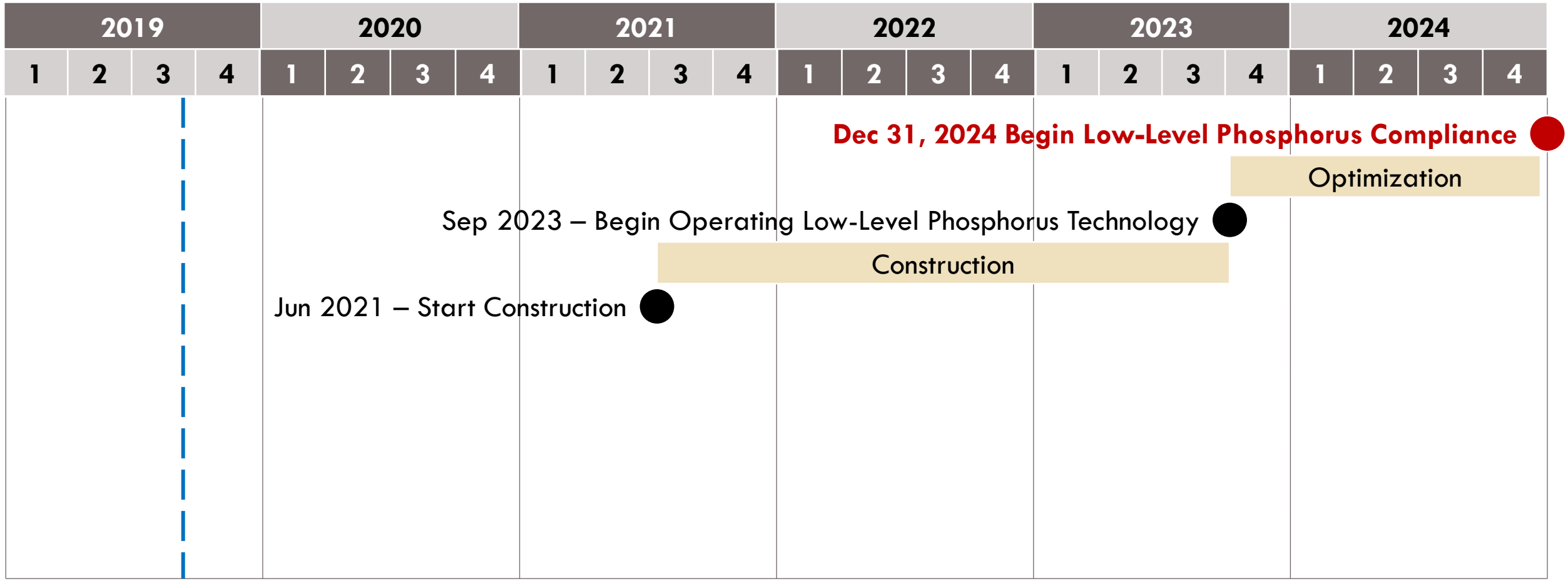
Schedule

The Phosphorus Deadline

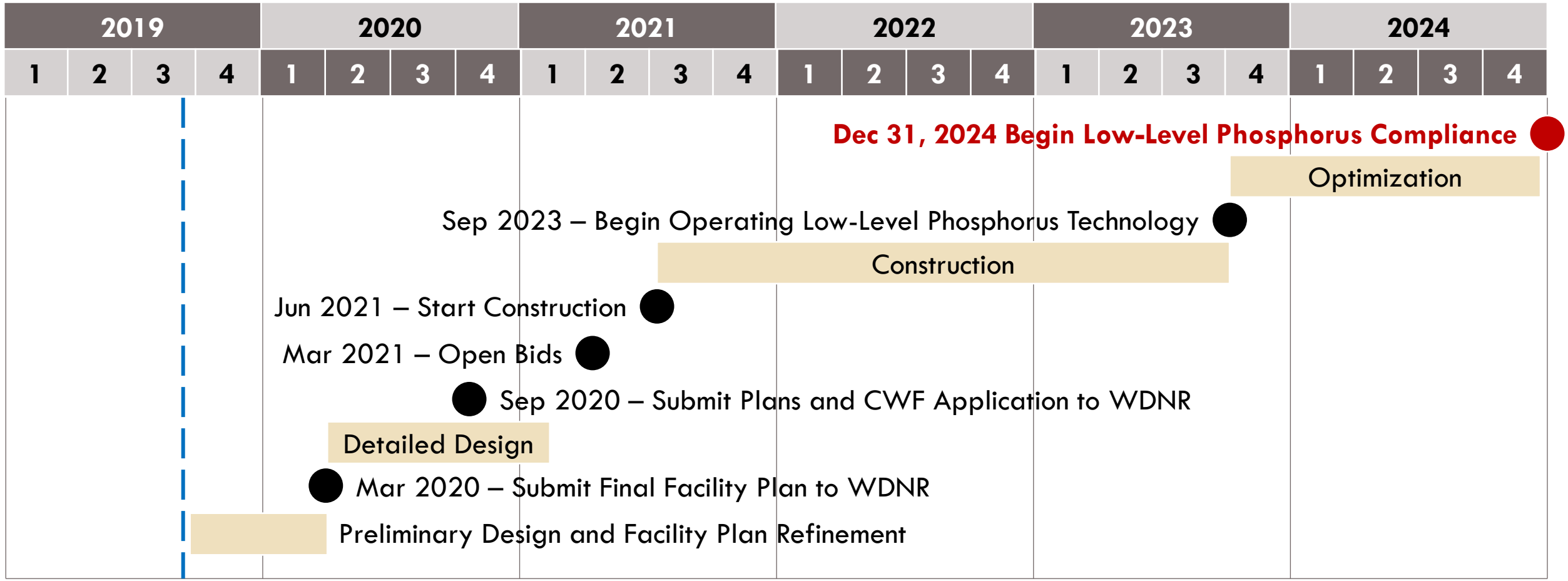


Schedule
System Optimization Phase

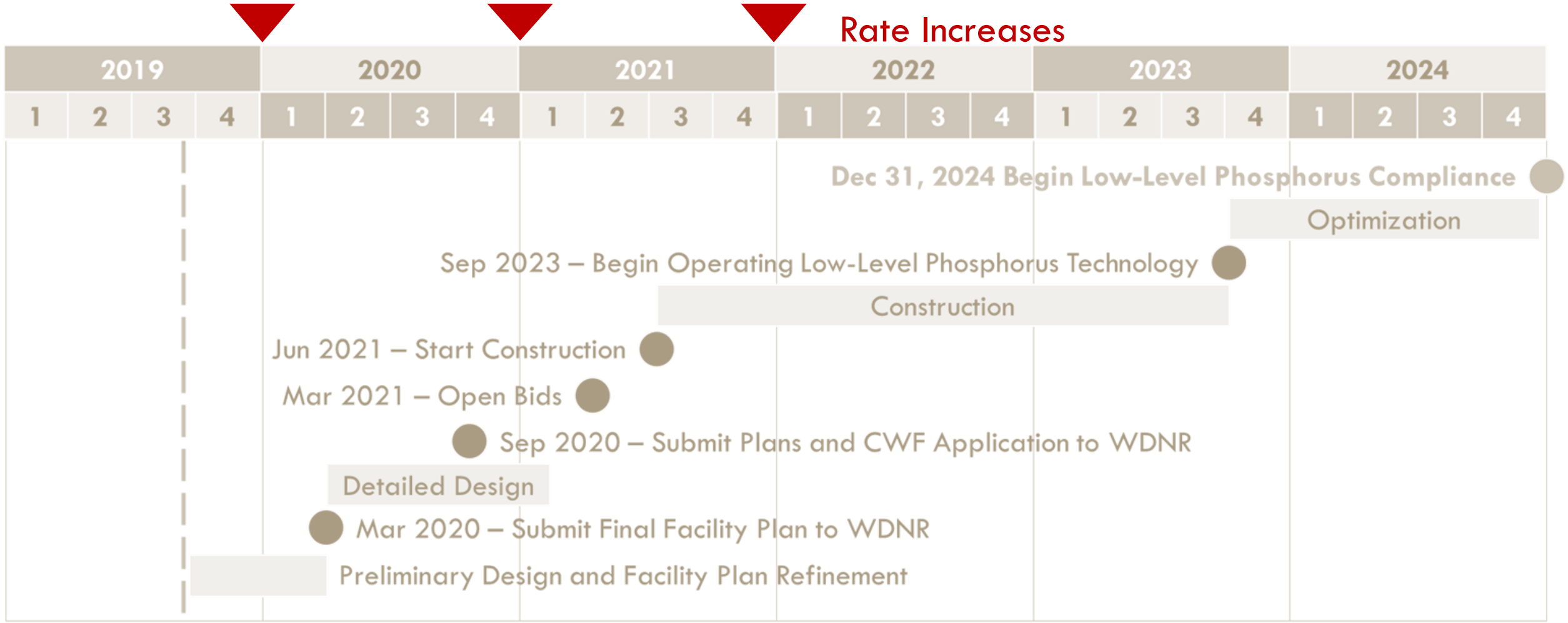
Schedule
Construction Phase



Schedule
Plan Refinement and Design Phase



Schedule
Funding the Plan



WPDES Permit Requirement and Facility Planning

The EPA and WDNR Require Comprehensive Planning for a Generation: 20 Years

- Facility Planning Must Address
  - Regulatory Compliance
  - Capacity
  - Safety
  - Cost Effectiveness

The Plant has been Accepting and Cleaning Wastewater for Generations

- Phase 1 1936 83 Years Old
- Phase 2 1972 47 Years Old
- Most-Recent Minor Improvements
  - Biological Phosphorus – 1996
  - Biosolids Storage – 1997-2001
  - Screening and Grit – 2001
  - UV Disinfection – 1991/2004/2008
  - Blowers and Diffusers – 2011
  - Digester Covers – 2015-2018

The Plant Needs Improvements for the Next Generation

- The City has received a lifetime of reliable service from the major wastewater infrastructure, surpassing two generations since the last major upgrade
- It's time for another upgrade

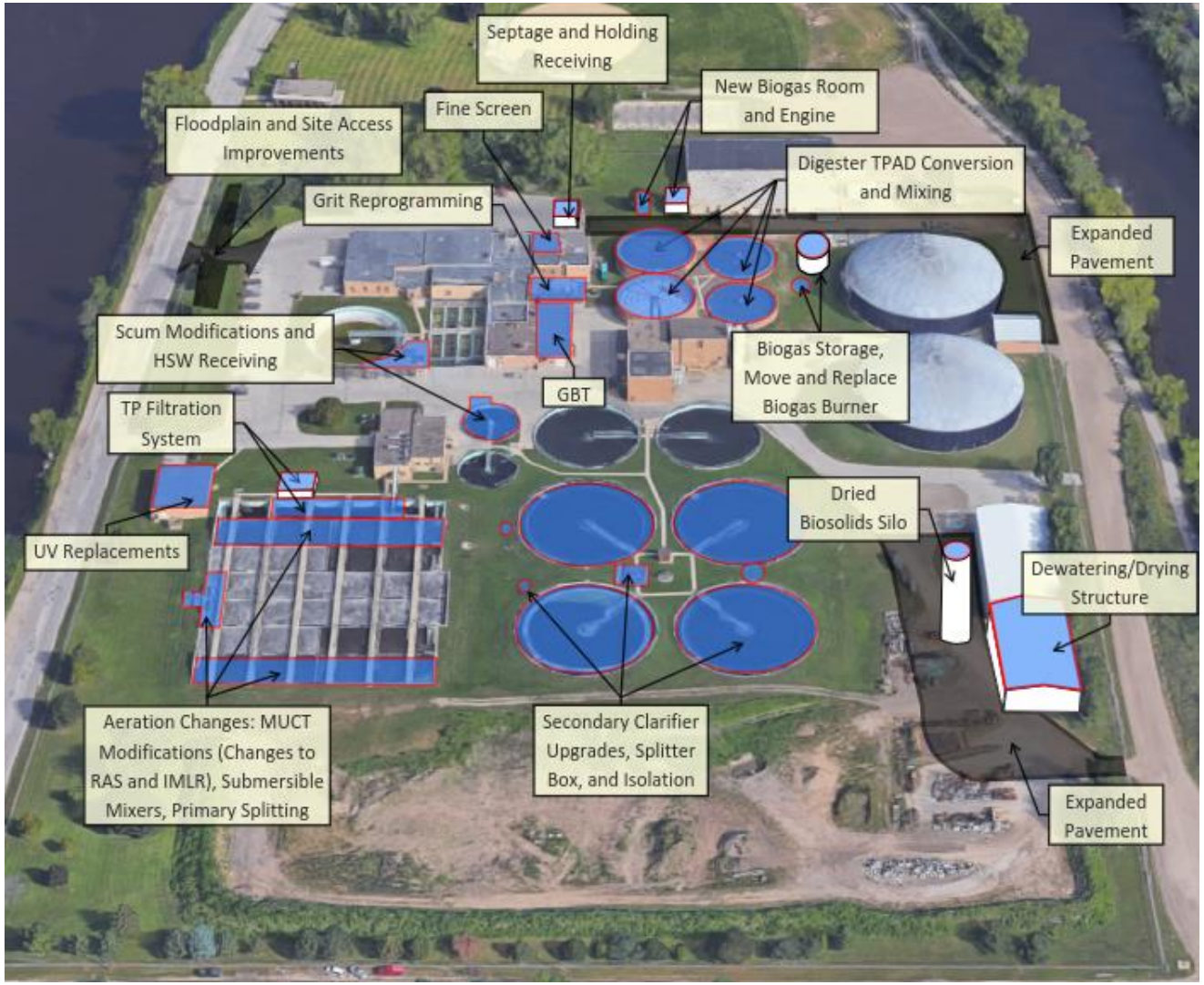
The Plant is One of the Most Valuable City-Owned Assets

- Potential Value = $420M
- Foremost Facility Planning Objectives
  - Maximize Benefit of Existing Infrastructure
  - Maximize Return on Tremendous Previous Investment

The Plan

The Issues are Pervasive, but Not Dire. Plant Offers Tremendous Value.

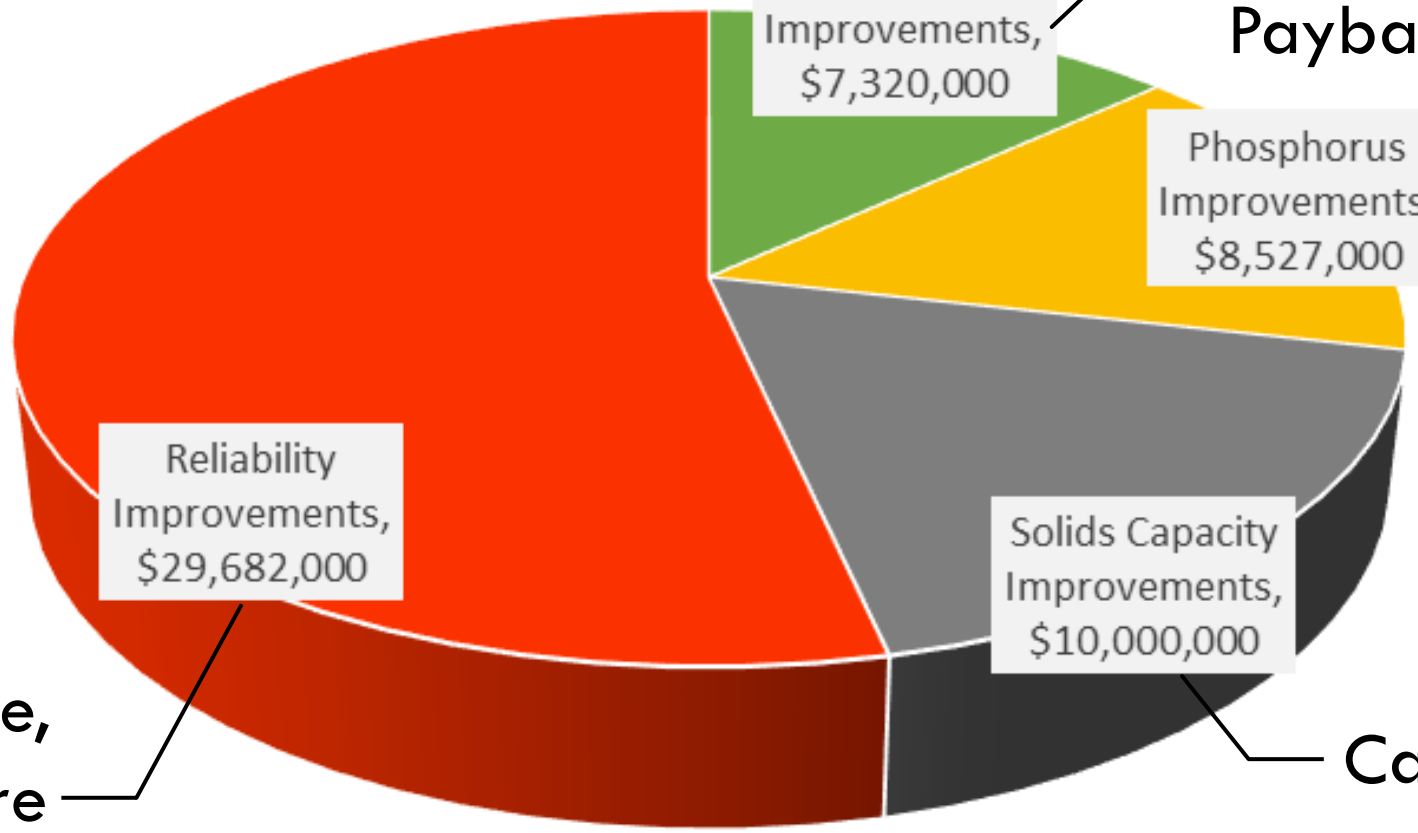
- Capacity
  - Biosolids Processes
- Safety, Reliability, Performance
  - Present-Day Safety Standards
  - Aging Equipment/Infrastructure
- Regulations
  - Phosphorus
  - Biosolids
- Resource Recovery
  - Biogas Conditioning and Utilization
  - Renewable Energy Production



Plan Overview

- Rehabilitate
- Repurpose
- New
- Do Nothing

Comprehensive Upgrade for the Next Generation $55.5M



Resource Recovery
Payback <20 years

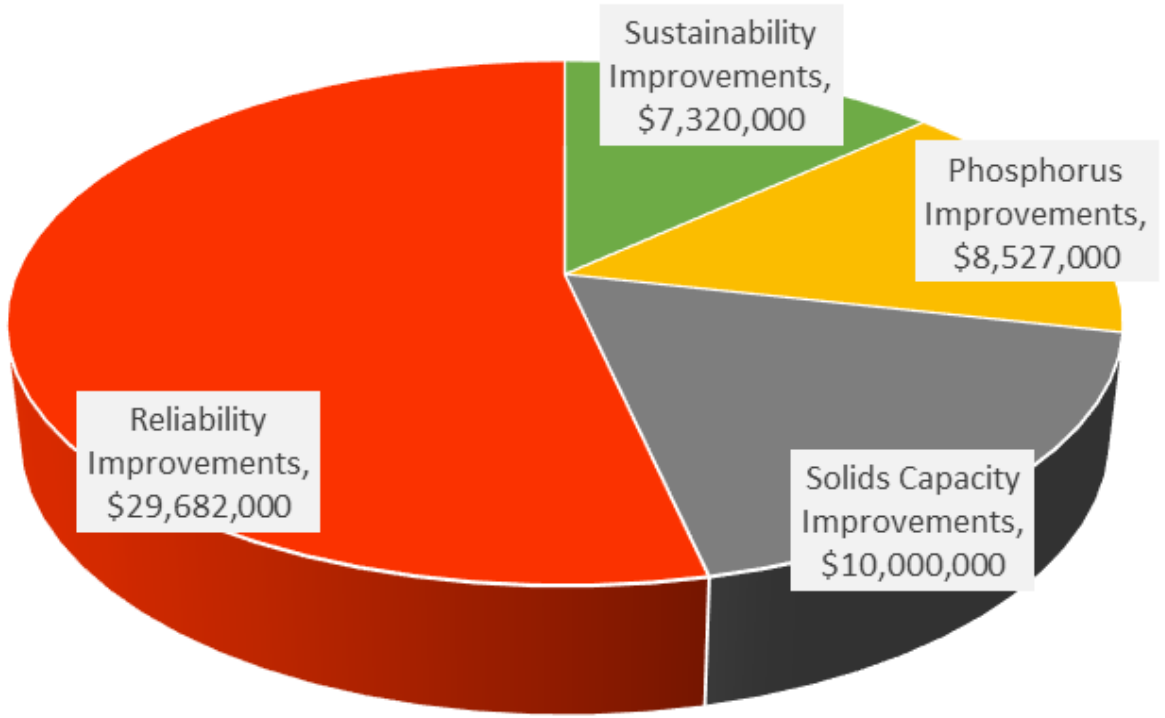
Regulatory Compliance

Capacity

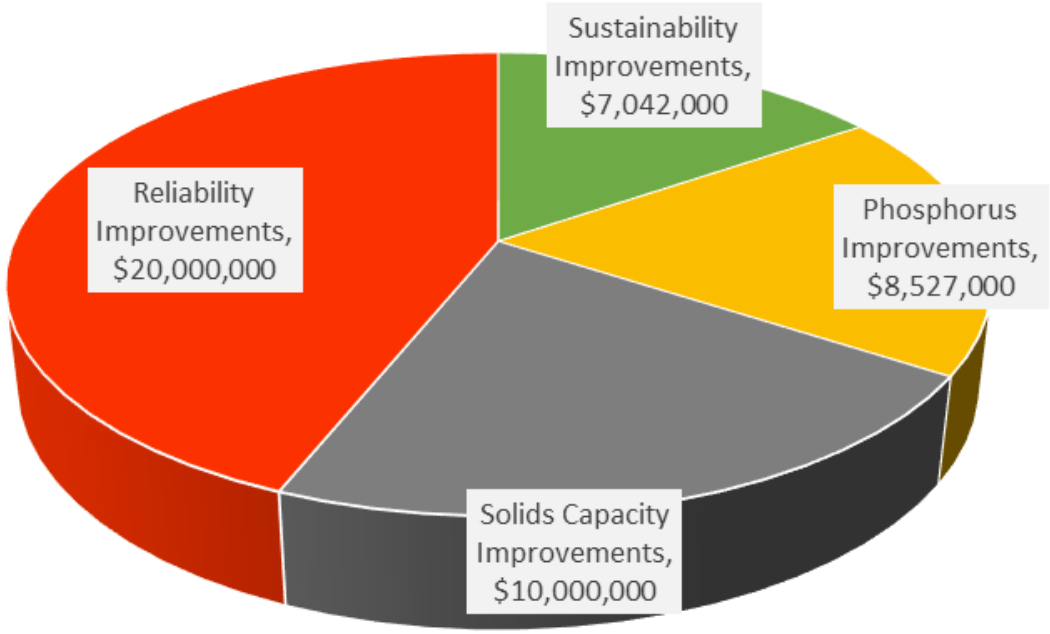
Public Safety, Environmental Stewardship, Code Conformance, Aging Infrastructure

Cost Sensitivity Related to Wholesale Customers

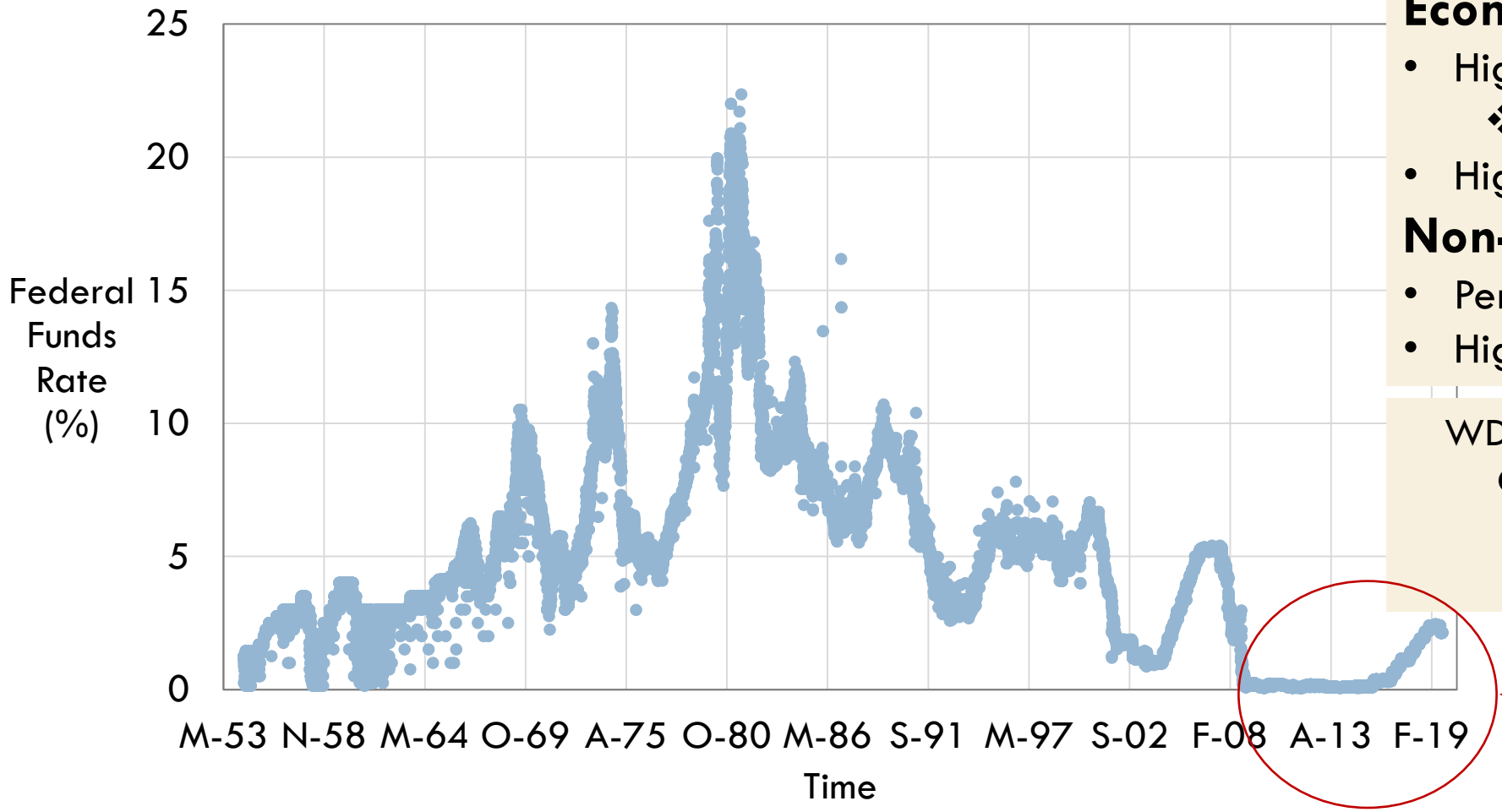
Recommended Plan
$55.5M



Modified Plan
$45.6M



Piecemeal Upgrades More Expensive, Disruptive, Risky



Economic

- Higher Construction Cost
  - ❖ Poor Economy of Scale
- Higher Borrowing Cost

Non-Economic

- Perpetual Disruption
- Higher Risk

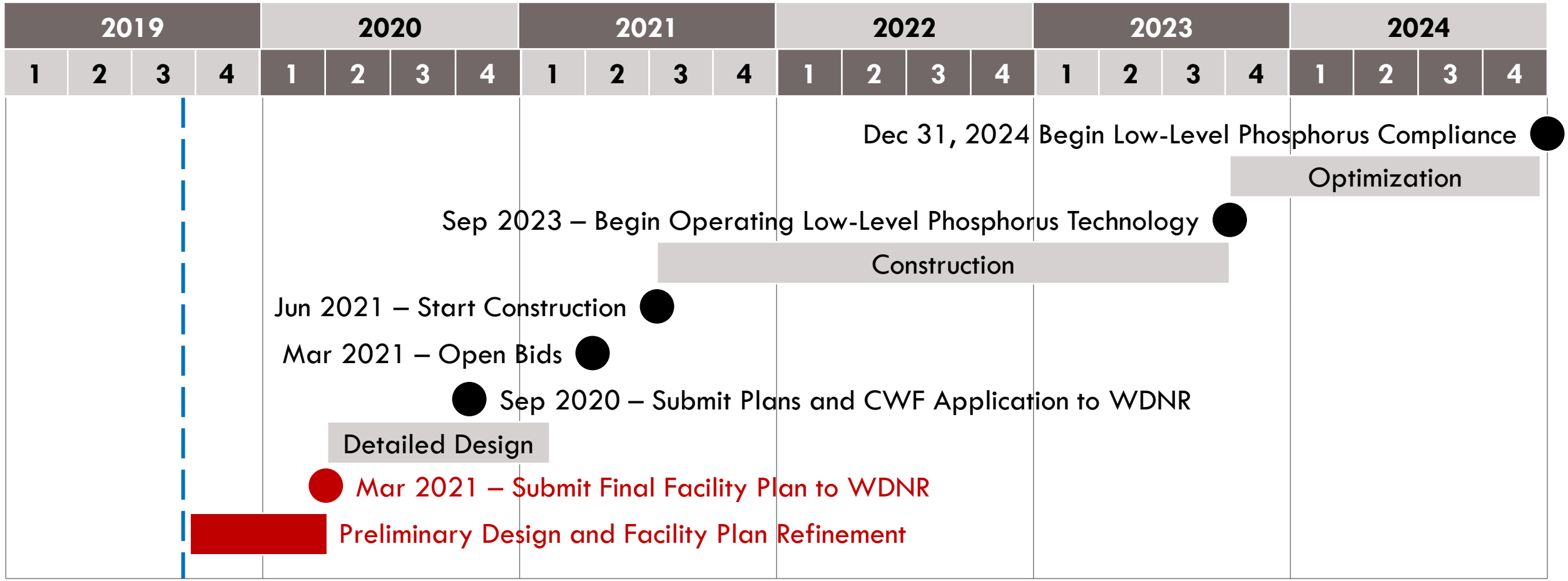
WDNR Lowered Interest Rates for the Clean Water Fund in Jun 2019

Base Rate = 1.76%

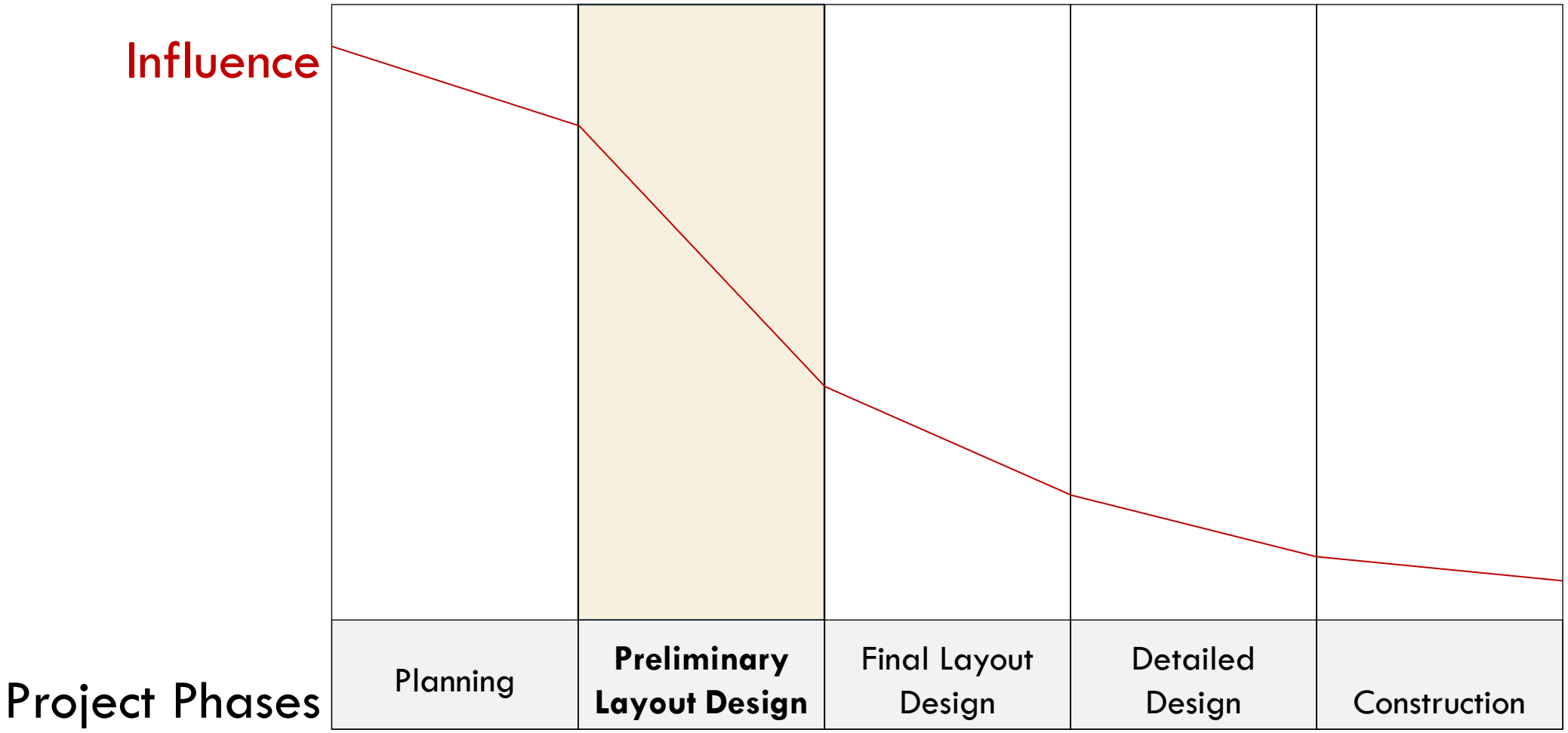
Period of Historically Low Lending Rates

The Next Step

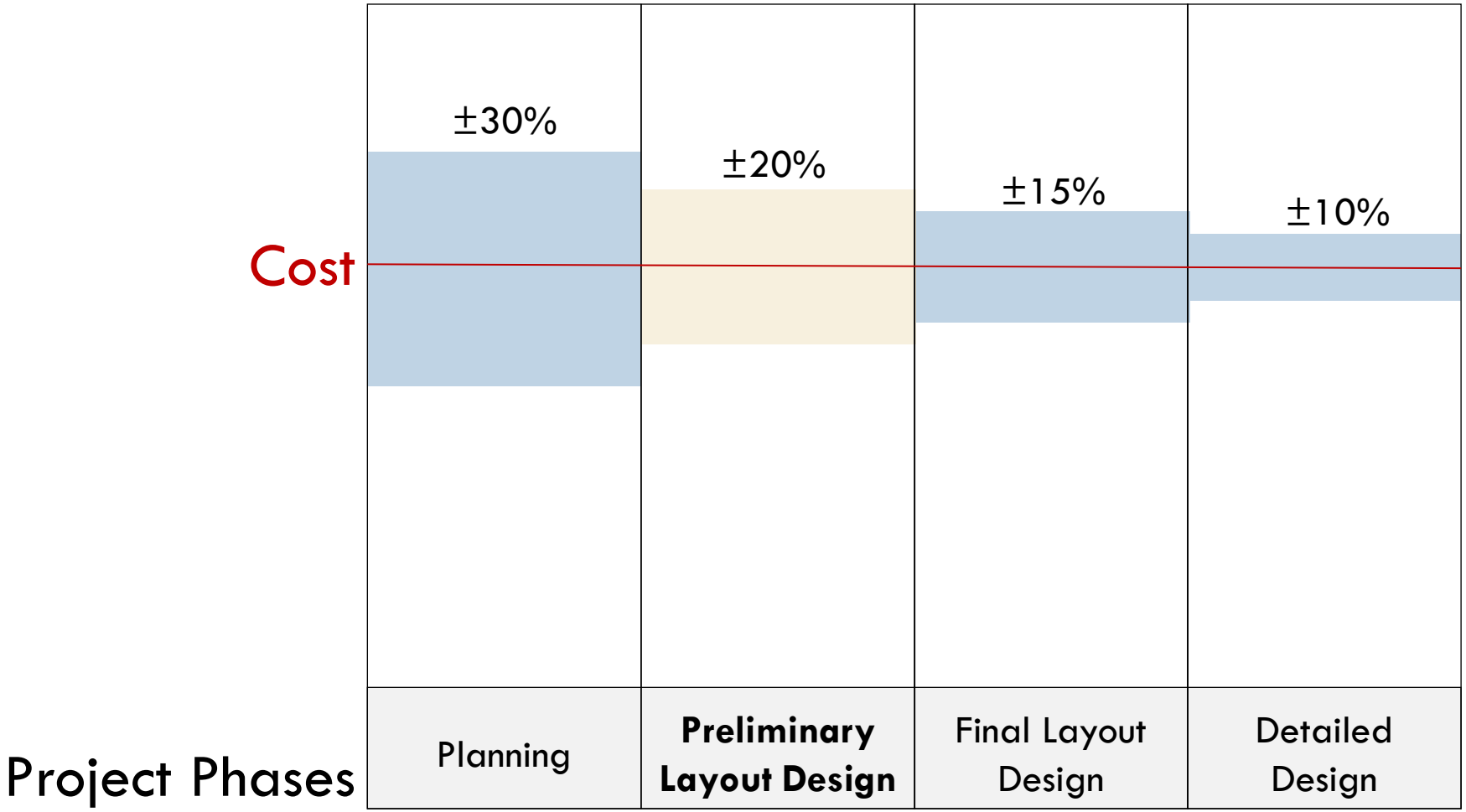
Schedule
Plan Refinement and Design Phase



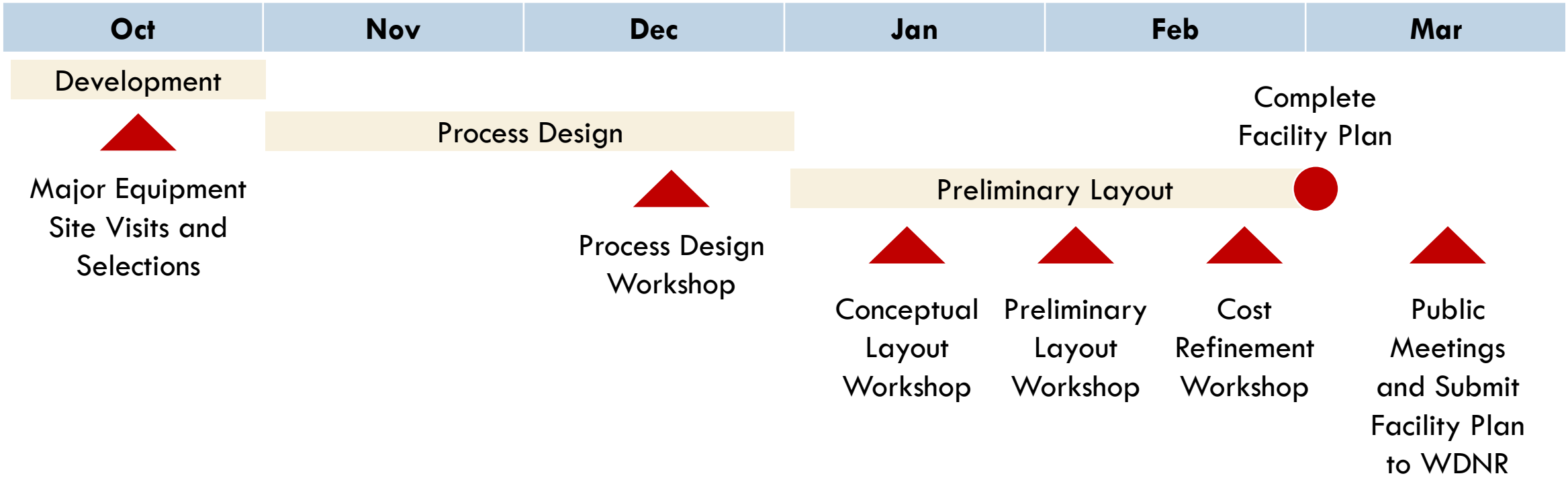
Opportunity to Influence Cost



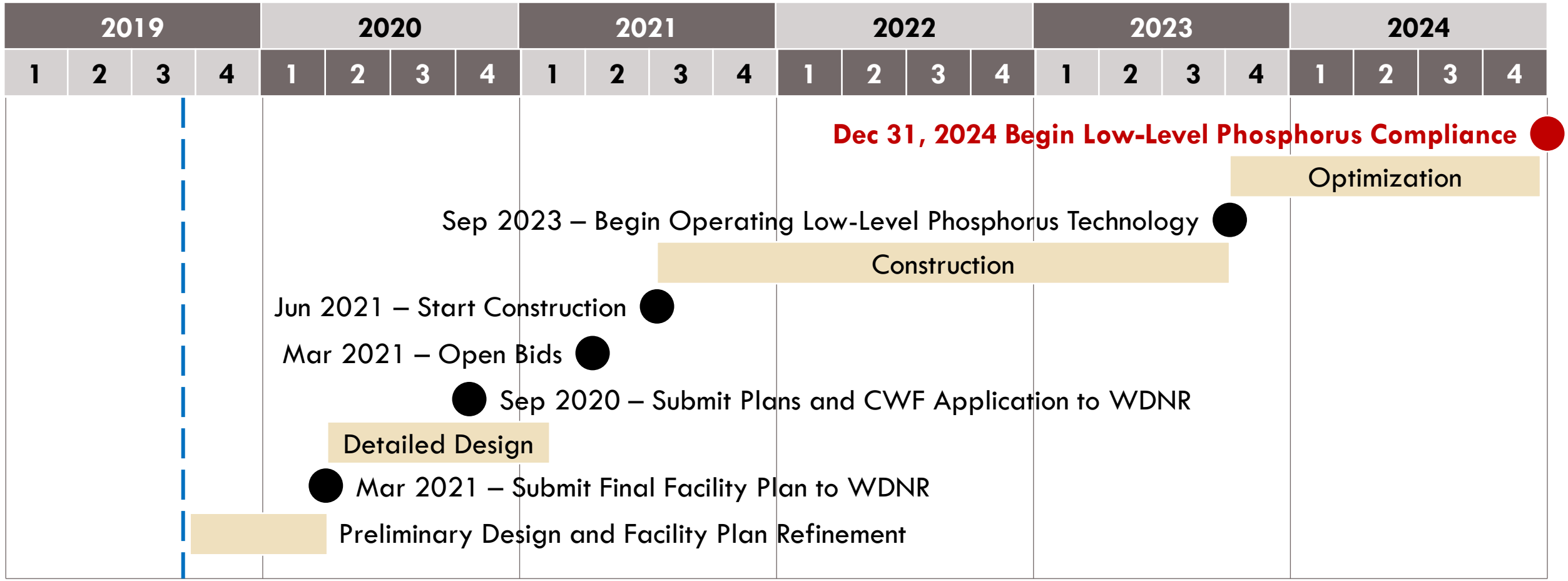
Cost Opinion Resolution and Accuracy Improves During Preliminary Design



Preliminary Layout Design Schedule with Partner Entities' Involvement



Schedule


2019
2020
2021
2022
2023
2024
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
Dec 31, 2024 Begin Low-Level Phosphorus Compliance
Optimization
Sep 2023 – Begin Operating Low-Level Phosphorus Technology
Construction
Jun 2021 – Start Construction
Mar 2021 – Open Bids
Sep 2020 – Submit Plans and CWF Application to WDNR
Detailed Design
Mar 2021 – Submit Final Facility Plan to WDNR
Preliminary Design and Facility Plan Refinement

Questions

Thank You

Schedule

Reminder that Donohue has been at this for 10 yrs, not a rushed schedule, just now we cannot push the schedule any further.

The Schedule

2019				2020				2021				2022				2023				2024			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4