

CITY OF BEND

Water Reclamation Facility Plan Update

Client Project No.: 1SFPU
Carollo Project No.: 203654
Date: April 9, 2026
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Reviewed By: Jeff McCormick, PE
Subject: Urgent Needs

The City of Bend (City) is in the process of developing an update to the Water Reclamation Facility (WRF) Facility Plan (Facility Plan Update, or FPU). To date, the consultant team (Carollo Engineers [Carollo]) have completed assessments of facility condition and capacity sufficient to begin the process of identifying capital needs at the WRF through the FPU planning period (2045).

1.0 FPU GOALS AND OBJECTIVES

The ultimate objective of the FPU is to establish a capital program for improvement of WRF facilities aligned with capacity and condition needs through the planning period. Any capital program must also achieve the following goals, as established by the City:

1. Compliance with water pollution control facility (WPCF) permit requirements, which regulate effluent discharge activities at the WRF, including limitations on effluent water quality and management of resources produced (such as recycled water and biosolids).
2. Address identified building and land code related issues, in particular those which may impact health and safety of City staff and other personnel present at the WRF site.
3. Provide uninterrupted receipt of hauled wastes (septage, portable toilet waste, fats, oils and grease [FOG]) from within City limits and the greater Deschutes County. This waste is currently processed and beneficially used to amend soil on lands within Deschutes County by a third-party contractor.
4. Maximize the beneficial use of resources produced at the WRF – reclaimed water, biosolids and biogas.
5. Limit the instances which may be necessary from time to time, of disposal of biosolids and hauled waste in lieu of beneficial use.
6. Reduce and minimize the risk of nuisance odors produced by WRF operations.
7. Put WRF facilities on a path to achieve ongoing City climate and energy goals.

2.0 PRELIMINARY FPU ASSESSMENT FINDINGS – PROBLEM STATEMENT

The FPU team identified limitations in the capacity of liquid and solids treatment process elements and conditions that put the likelihood of achieving a number of the stated FPU goals at risk. In particular, the solids digestion and secondary treatment facilities at the WRF are at, or are nearing capacity. Additionally, critical components associated with these facilities are at risk of failure and require significant, ongoing maintenance and repair efforts. Some of these process areas include equipment which has been in service for over 25 years and in some cases, since the initial construction of the WRF over 40 years ago. Over capacity conditions at the facility include difficult operational environments which contribute to accelerated wear, evidenced by frequent maintenance staff attention and expense.

Further details of the assessment findings will be presented in the FPU document as the planning process advances toward completion. This memorandum has been drafted to convey the urgent nature of needed solids digestion and secondary treatment improvements. The following risks warrant accelerated project approval and implementation to address digestion and secondary process area deficiencies:

- Risks to personnel safety, particularly in the digester complex,
- Risk of non-compliance with WPCF permit requirements as loads from service area growth are accommodated, and
- Potential hauled waste service interruptions.

While compliant with building and electrical code requirements when placed in service, the current operating conditions in the digester complex expose City staff and other personnel to significant safety risks. These should be mitigated on the shortest timeline practicable. These mitigation measures will require complete replacement of several facilities, because rehabilitation or modification of existing facilities is not practical or economical.

The FPU team has concluded that the digester reactors are currently out of capacity, overloaded, and at risk of process upset. These capacity limitations prevent the safe removal of any one of the three existing digesters from service without risk of process upset or regulatory non-compliance. As an example, in the summer of 2025, cleaning of Digester 3 which required that reactor to be removed from service for several weeks, resulted in the overloading of Digesters 1 and 2. This condition produced highly odorous sludge consequently causing odor complaints to be received and the City to incur costs for landfilling partially digested solids. The WRF staff cannot repeat this needed maintenance activity until additional digester capacity is in place.

Digestion and secondary treatment upgrades will also be required to keep pace with anticipated service area growth through 2045 while concurrently addressing existing facility and equipment deficiencies (as mentioned above). Specifically, the secondary treatment process performance has been inconsistent, leading to episodic exceedances of WPCF permit limitations. This is indicative of capacity limitations which will become an increasing risk as the City of Bend service area continues to grow.

The future status of the City’s third-party hauled waste contractor increases the urgency of facility needs. The contract with the City’s current provider, Agri-Cycle, will expire by June 30, 2030, or sooner –if they choose not to renew. The City has previously determined that continuation of hauled waste service is best achieved through processing of these wastes via the WRF. However, because these existing processes are already at or nearing capacity, this hauled waste load will accelerate the need for investment in facilities to receive and treat waste at the WRF and eliminate any flexibility the City otherwise previously had to phase these improvements.

Introducing hauled waste into the WRF is not recommended before construction of a fourth solids digester and secondary clarifier, both of which are identified as necessary to address the existing performance issues noted above. Figure 1 illustrates a likely timeline for construction of digester complex improvements (including Digester No. 4) and Secondary Clarifier No. 4 based on the third-party hauled waste management operation ceasing by June 30, 2030. It can be observed planning, design and construction of these facilities is predicted to be complete no sooner than December 2031.

The City is currently considering options to bridge the gap between new facilities being placed into service (December 2031) and expiration of the third-party contract (June, 2030). Regardless, the current situation calls for urgent attention and action in order to reduce safety, compliance and service interruption risks.

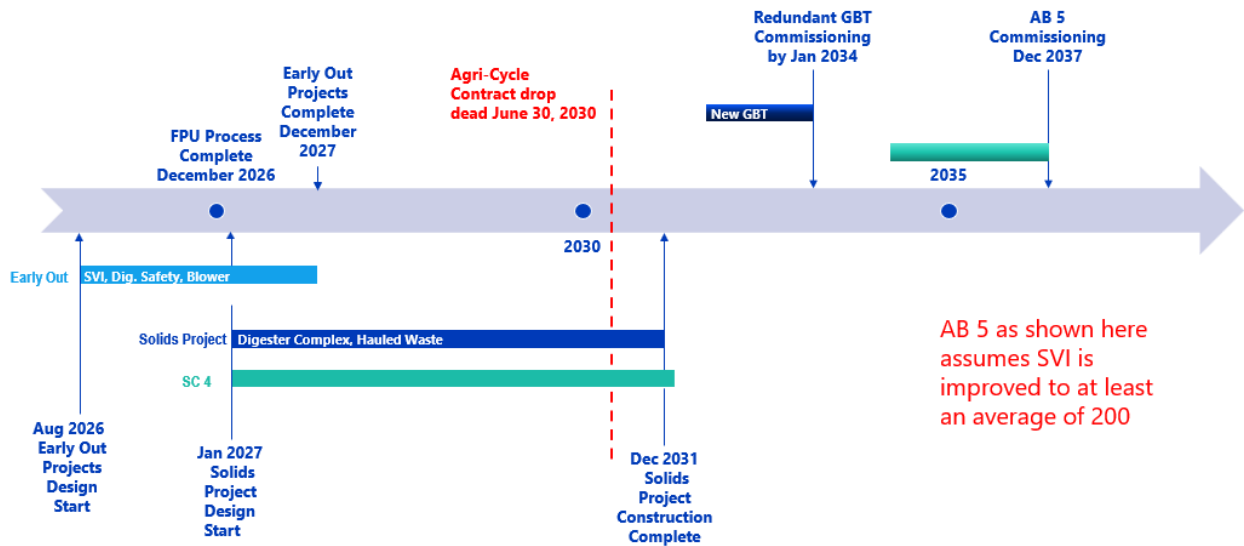


Figure 1 Initial FPU Projects Timeline

3.0 COMPONENTS OF IMPROVEMENTS TO ADDRESS CAPACITY AND CONDITION RELATED NEEDS

Table 1 summarizes the facilities required to:

- Address urgent safety and facility condition related concerns,
- Provide capacity for service area growth,
- Address process performance concerns, and
- Receive and treat hauled waste.

This list should not be considered comprehensive as the FPU alternative analysis has only recently been completed and the FPU team has yet to develop full project component inventories and cost estimates. Project components common to all alternatives were not detailed during alternatives analysis as they did not contribute to differentiation between options for decision making purposes. The number of process area components involved and the complexity of the mechanical, electrical and control improvements will require further definition in order to properly solicit construction services. As such, the following project phases, or steps are included in the timelines presented in Figure 1:

- Preliminary design/basis of design.
- Detailed design.
- Construction.
- Start-up and commissioning.

A more detailed depiction of the project schedule is provided in Attachment A.

The facility components summarized in Table 1 are being further detailed as FPU alternatives analysis is completed. At this time, the FPU team estimates that the solids project (digester complex and hauled waste improvements) design, construction and commissioning is expected to exceed \$100 million. It is possible this opinion of cost will grow depending on a number of factors, including, but not limited to the scope of the final alternatives selected for inclusion in the FPU CIP, construction market conditions, supply chain constraints, equipment and materials availability, etc.

In addition to the solids improvements needed, the City must invest in improvements to the secondary treatment process, including a fourth secondary clarifier. The components of these secondary treatment process improvements are also summarized in Table 1. The City can expect these improvements to cost in excess of \$70 million (total project cost).

Table 1 Early Out Project Definition

Alternative	Driver	Estimated Project Cost	Project Definition
Solids Project	Capacity	>\$100M	<ul style="list-style-type: none"> ▪ Demolition and replacement of maintenance building. ▪ New 0.8 MG Digester 4. ▪ Digester 4 control building. ▪ Boiler building with three 3.35 MBTU/hr boilers. ▪ Gas conditioning building for pretreatment of H2S and Siloxane. ▪ Demolition of existing flare and replacement/relocation with new larger self-contained flare. ▪ Yard piping: <ul style="list-style-type: none"> » Replace and upsize existing digester gas piping and route to new common gas treatment. ▪ Electrical: <ul style="list-style-type: none"> » Site electrical for running new 2000 kVA utility service. » New electrical building with all new digester complex electrical serving new and existing Digesters 1-4. » Demolition and replacement (at new electrical building) of digester complex MCC and PLC including replacing existing SWBD-A (thickening building), MCC-W (thickening building), MCC-D, MCC-D1. <ul style="list-style-type: none"> ▪ New 2500A SWBD-D and new 2000A MCC-D » New 1500 kW backup generator
Hauled Waste	Other	\$15M	<ul style="list-style-type: none"> ▪ Septage receiving facility. ▪ FOG receiving facility.
SC4 + RAS/WAS Pump Station	Capacity	> \$70M	<ul style="list-style-type: none"> ▪ New 80 foot diameter SC 4. ▪ New MLSS distribution structure for SC4 and potential future SC 5 and SC 6. ▪ Demolition of abandoned chlorine contact basins. ▪ Yard piping: <ul style="list-style-type: none"> » Routing new 42 inch MLSS line to new MLSS distribution structure. » Relocating existing RAS lines to new RAS/WAS PS. Upsizing existing RAS line to ABs ▪ New 12 mgd firm capacity RAS/WAS PS for pumping RAS/WAS from all SC 1-4 and future potential SCs. ▪ Replacing existing clarifier mechanisms for SC 1-3 to suction header sludge collector style. ▪ Electrical: <ul style="list-style-type: none"> » Demolition of transformer TX-B2 and TX-B; replacement of TX-B2 with new 2500 kVA transformer. » Replace existing Switchboard-B with a new 3000A SBD to power new RAS PS and existing Blower Building B. » Replacement of MCC-PW and MCC-RAS/PLC. » New 2kW backup generator for blower building.

Notes:

AB - aeration basin; FOG - fat, oil, or grease; H2S - hydrogen sulfide; kVA - kilovolt-ampere; MBTU/hr - 1,000 British thermal units per hour; MCC - motor control center; MG - million gallon; mgd - million gallons per day; MLSS - mixed liquor suspended solids; PLC - programmable logic controller; PS - pump station; RAS - return activated sludge; SC - secondary clarifier; SWBD - switch board; WAS - waste activated sludge.

4.0 POTENTIAL RISKS ASSOCIATED WITH PROJECT IMPLEMENTATION

Delay in implementation of urgent WRF projects poses the following risks:

- Risks to personnel safety, particularly in the digester complex,
- Risk of non-compliance with WCPF permit requirements as loads from service area growth are accommodated,
- Risk of increased costs due to landfilling of solids resulting from digester upset, and
- Potential hauled waste service interruptions.

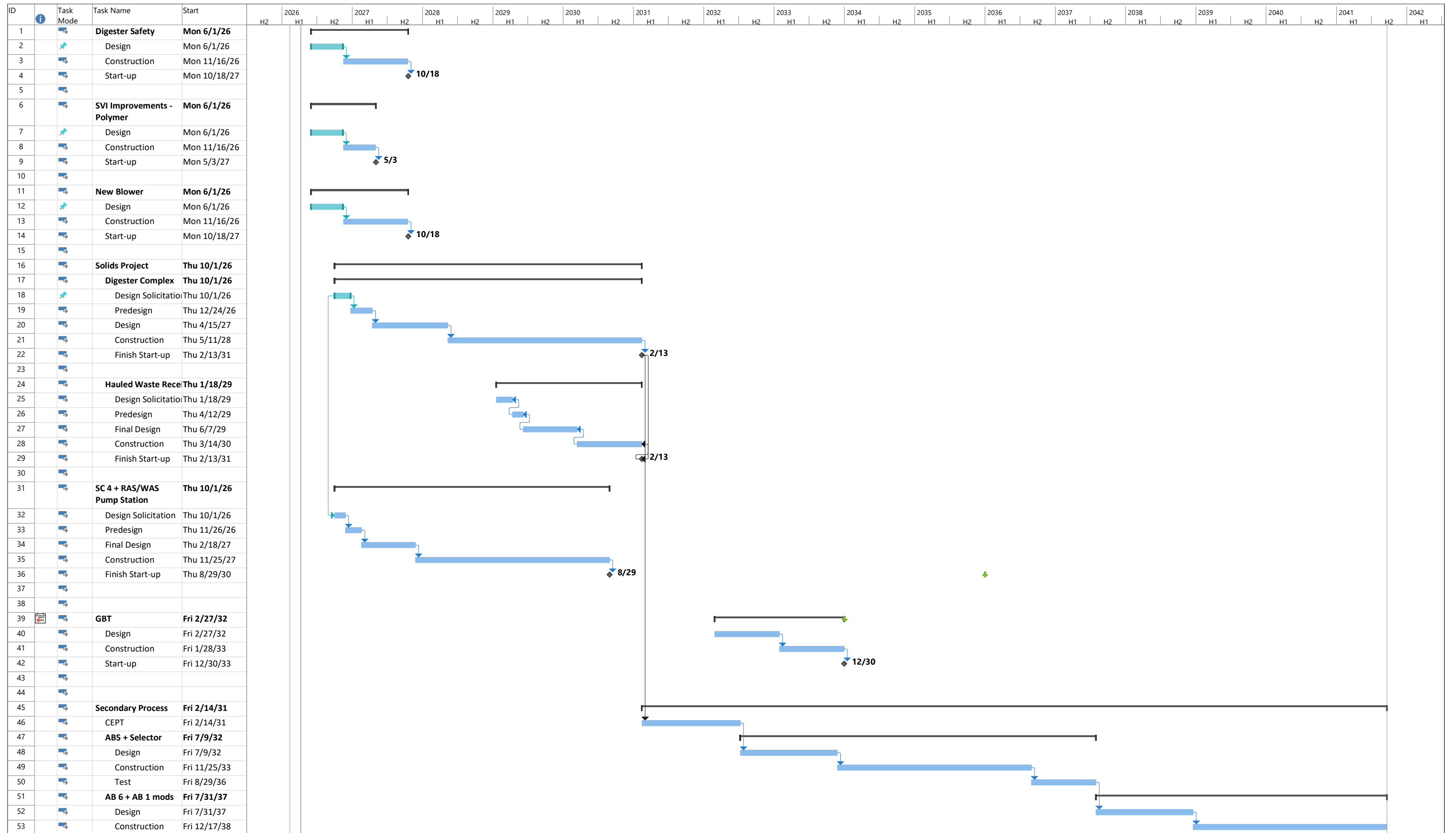
While delaying these needed projects presents risks, implementation also presents unique challenges which must be considered, including, but not limited to:

- Complex construction, requiring careful attention to sequencing of work and process/operational interdependencies to avoid process upsets, permit violations delays and cost escalation.
- Costly investment over a relatively short period of time which will impact rates and charges paid by both existing and future users.

The solids and secondary process improvements identified in the FPU are necessary for the City to maintain compliance with regulatory requirements and protect personnel and public safety. While implementation of these projects will take a number of years, City staff have identified temporary measures and minor projects which may reduce some of the risks identified above. These include:

- Pilot testing chemical addition to determine effectiveness and reliability in reducing WRF secondary process challenges.
- Identifying and advancing improvements in the digester complex that address potential safety and process upset risks which may be advanced as the larger capital project is designed.

ATTACHMENT A **PROJECT DELIVERY SCHEDULE**



Project: Project Delivery Schedu
Date: Thu 4/9/26

