“...make decisions that do the most good, for the most people, for the longest period of time”

Source: 2017-18 City Council Goals
Introductions
Team Introductions

Greg Springman
Public Works Director

Trish Rice
Engineering Technician

Preston Van Meter, PE
Project Manager

Austin Rambin, PE
Project Engineer

Steven Haney
WWTP Project Manager

CITY AND WWTP

Patrick Davis
Staff Engineer

Jessica Cawley
Staff Engineer

MURRAYSMITH
Project History
Original Facilities Plan Review

Future Rates: ~$95/month

Original Recommended Plan:
- $42 Million over 30 years
- Separate Peak Flow Process
- Limited Rehabilitation
Continue Collection System Focus

Peak hour flows do not account for future population growth or expansion of the City’s service area.
Continued Collection System Focus

• Allow for future growth (1.8 MGD in additional peak flow, per 2016 Facility Plan)
• Address aging collection system
• Maintain WWTP Flow < 12 MGD

$3 - 6M of targeted collection system rehabilitation:
• Remove ~2 MGD of RDII over next 20 years
• To be completed in-house by City staff
• City working on manhole sealing now
Existing WWTP Review

Upper Plant – Expansion Area

Lower Plant – Existing Facility Area
Existing WWTP Challenges

• Secondary only, complete mix process
• No Headworks (rags everywhere)
• Early 1990’s upgrade added tertiary sand filters
• Undersized CCB & outfall
• Inadequate Aerated Sludge Storage Basin
• Dewatering Facility with significant code violations
• Limited SCADA/automation

Multiple DEQ fines for permit violations in past few years
“3R” Asset Management Approach

- **Rehabilitate** existing structures
- **Reuse** existing assets
- **Re-purpose** existing processes/areas
Rehabilitation @ Half the Cost of New Construction – if done timely!
Targeted Avg. Monthly Wastewater Rate

~$30/month lower
20% Schematic Design
Base Upgrades
Sweet Home WWTP
Schematic Design – Base Upgrades

Legend

Liquid Stream

Solid Stream

Miscellaneous

- Primary Digester
- Mechanical Building
- Secondary Digester
- Primary Clarifier
- Secondary Clarifier 1
- Secondary Clarifier 2
- Secondary Clarifier 3
- Primary Digester
- Secondary Digester
- Storage Building with Solids Thickenening Room
“3R” Elements:
- Influent Pump Station (IPS)
- Aeration Basin Expansion
- Secondary Clarifiers
- Chlorine Contact Chamber
- Aerobic Digester
Influent Pump Station

Reuse and rehabilitate existing influent pump station wet well saves $$ for other upgrades

Estimated Cost - $2.1 M
Construct new headworks with grit removal to improve overall process and biosolids quality.

Estimated Cost - $2.9 M
Primary Clarifier

• Add one new primary clarifier
  • Provisions for future expansion

• Allows plant solids process to be converted to anaerobic digestion
  • Eliminates energy-intensive aerobic process

• Provides possible incentives from Energy Trust of Oregon (ETO)

Estimated Cost - $1.7 M
Aeration Basin Modifications

- Extend and rehabilitate the existing basin
- Change the flowpath
- Improve aeration
- Improve operational flexibility
Secondary Clarifiers

Rehabilitate 3 existing Secondary Clarifiers
Add one new (larger) Secondary Clarifier #4

Estimated Cost - $2.4 M
UV Disinfection

Convert existing CCB to Ultraviolet (UV) Disinfection

Estimated Cost - $1.3 M
Solids Thickening

Construct new Storage/Thickening Building

Install Sludge Thickening Equipment

Estimated Cost - $0.9 M
Solids Digestion

Construct new Primary Anaerobic Digester

Convert existing Aerobic Digester to Secondary Anaerobic Digester

Estimated Cost - $3.1 M
Solids Dewatering

Demolish Existing Dewatering Facility
Solids Dewatering

• New Dewatering Building on Upper Plant Area
• Cost-effective Premanufactured Metal Building
  • Enclosed screw press
  • Covered “cake” storage area
• Produce high quality Class B Biosolids product
• Class B gives City options to eliminate $130,000/year landfilling fees
• Class A Biosolids provide more disposal options

Estimated Cost - $1.3 M
Civil Site Improvements

- Site entrance and accessibility
- Site security
- Stormwater management
Electrical and SCADA Improvements

- 3 Electrical Rooms on site
- Central CP in Administration Building
  - Redundant PLC’s
  - Remote I/O in other Electrical Rooms
- Provide remote login capability for Plant Staff
- Plant Wifi Network with operator tablets

Estimated Electrical Cost - $2.3 M
Estimated Automation Cost - $0.5 M
## Base Project Cost Summary

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Influent Pump Station</td>
<td>$2,100,000</td>
</tr>
<tr>
<td>Headworks Screening and Grit Removal</td>
<td>$2,900,000</td>
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<tr>
<td>Primary Clarifier</td>
<td>$1,700,000</td>
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<tr>
<td>Aeration Basin Modifications</td>
<td>$3,500,000</td>
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<tr>
<td>Secondary Clarifiers</td>
<td>$2,400,000</td>
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<tr>
<td>UV Disinfection</td>
<td>$1,300,000</td>
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<tr>
<td>Solids Thickening</td>
<td>$900,000</td>
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<tr>
<td>Solids Digestion</td>
<td>$3,100,000</td>
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<td>Dewatering and Biosolids Storage</td>
<td>$1,300,000</td>
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<tr>
<td>Civil Site Improvements</td>
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<tr>
<td>Electrical and Instrumentation</td>
<td>$2,800,000</td>
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<tr>
<td><strong>Subtotal of Base Project Costs</strong></td>
<td><strong>$23,500,000</strong></td>
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</table>

(1) Costs include markups for General Conditions (8%), Mobilization (8%), Contractor O&P (12%), Design Contingency (20%), Construction Contingency (10%), and Engineering, Legal, and Contract Administration (25%)
Additional Project Elements to Address Unanticipated Challenges
Unanticipated Project Elements

1. Tertiary Filters & Mass Load Limits
2. New Administration Building
3. Class A Biosolids Composting
Existing Tertiary Sand Filters

• Sand filtration not generally good in WW treatment
• Requires pumping
• Limited capacity
  • 2 to 4 MGD
• Uses Chlorine
  • Converting to UV disinfection
• Difficult to operate
NPDES Permit Limits

- NPDES Permit Expired in 2010
- Mass Load Limits may limit discharge in future as ADWF increases
- Pursue Mass Load Increase through DEQ
  - Anti-Degradation Evaluation Required
- Recommend keeping tertiary filtration to maximize potential for mass load increase

Treated Effluent Outfall 001

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average Effluent Concentrations</th>
<th>Monthly Average</th>
<th>Weekly Average</th>
<th>Daily Maximum</th>
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<tr>
<td></td>
<td>Concentrations</td>
<td>Monthly</td>
<td>Weekly</td>
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<tr>
<td>CBOD₃ (See Note 1)</td>
<td>10 mg/L 15 mg/L</td>
<td>120</td>
<td>180</td>
<td>240</td>
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<tr>
<td>TSS</td>
<td>10 mg/L 15 mg/L</td>
<td>120</td>
<td>180</td>
<td>240</td>
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<tr>
<td></td>
<td>Concentrations</td>
<td>Monthly</td>
<td>Weekly</td>
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<tr>
<td>CBOD₃ (See Note 1)</td>
<td>15 mg/L 23 mg/L</td>
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<td>460</td>
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<tr>
<td>TSS</td>
<td>20 mg/L 30 mg/L</td>
<td>350</td>
<td>520</td>
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* Average dry weather design flow to the facility equals 1.38 MGD. Mass load limits have been individually assigned and are based upon prior permit.

2043 ADWF = 1.85 MGD (34% increase)
New Tertiary Filter Option

Total Cost - $1.85 M
Admin Building Rehabilitation

- Significant exterior upgrades required
- Men’s locker room is marginal and there is no women’s locker room
- ADA access issues throughout building
- Undersized and poorly laid out WQ Laboratory
- Few operator/staff works stations

Total Cost - $1.25 M
Offsite Class A Biosolids Composting

Covered Compost Pile at Florence OR WWTP

Estimated Total Cost - $1.6 M
Why Class A Biosolids Composting?

- EPA-approved, sustainable solution to resolve biosolids disposal problem
- Exceptional Quality Class A Biosolids can be beneficially reused on City parks, open spaces and provided to ratepayers with no restrictions
  - No restrictions on Class A Biosolids once it leaves the site
- Not subject to the whims of third-party material receivers as required for Class B Biosolids land application
- Create a high quality, valuable product that would save $130,000 in annual landfill tipping fees
How to Compost Biosolids?

• Treated biosolids are mixed with green waste (wood chips, leaves, grass clippings) collected from City streets and parks
• Compost piles are aerated to provide oxygen for aerobic microbes
• Compost piles are continuously monitored to meet EPA minimum temperatures to kill pathogens
• 4-6 weeks later the compost is ready for public use
• Composting requires adequate room for material storage and equipment movement (1+ acres present day / 2.5+ acres full buildout)
Additional Project Elements Cost Summary

<table>
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<tr>
<th>Additional Element Costs (^{(1)})</th>
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<tr>
<td>Tertiary Filter</td>
<td>$1,850,000</td>
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<td>New Administration/Lab Building</td>
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<tr>
<td>Offsite Class A Biosolids Composting Facility (Phase 1)</td>
<td>$1,600,000</td>
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<td>Subtotal</td>
<td>$4,700,000</td>
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\(^{(1)}\) Costs include markups for General Conditions (8%), Mobilization (8%), Contractor O&P (12%), Design Contingency (20%), Construction Contingency (10%), and Engineering, Legal, and Contract Administration (25%)
# Total Cost Summary

<table>
<thead>
<tr>
<th>Compiled WWTP Costs for Base and Additional Elements (1)</th>
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<tbody>
<tr>
<td>Estimated Base Cost</td>
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<tr>
<td>Additional Elements Cost Summary</td>
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<tr>
<td>Additional Elements Subtotal</td>
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</tbody>
</table>

(1) Costs include markups for General Conditions (8%), Mobilization (8%), Contractor O&P (12%), Design Contingency (20%), Construction Contingency (10%), and Engineering, Legal, and Contract Administration (25%)
Providing for future WWTP expansion beyond 20 year planning horizon

- Additional channel for additional influent screen in Headworks
- Provide piping for adding second Primary Clarifier in future (if needed)
- Providing for future Aeration Basin Capacity expansion (if needed)
- Provide for future filter capacity expansion (if needed)
Long Term O&M Considerations

“...make decisions that do the most good, for the most people, for the longest period of time” (2017-18 City Council Goals)

Proceeding with the $28.2M project offers:

- “3R” Approach brings aging facility back to life for 40-50 years
- Full plant automation reduces staffing requirements and cost
- Upgrades provide for cost-effective expansion in future to address unforeseen challenges (e.g. NPDES Permit, Industrial Growth, etc.)
- High quality compost eliminates $130k/year in landfill costs and provides a valuable end product for use by the City and residents
Project Funding Update

• **City funds.** With recent WW rate increase, the City is now building considerable reserves to support the project.
  • Currently projecting ~$7M in local funds at start of construction

• **Earmark Funding.** City is currently utilizing a $2M earmark from the Oregon State Legislature, with potential for another $3M earmark this legislative session.

• **USDA Grant Discussions.** Initial discussions with USDA indicate a grant of up to 25% of the unfunded balance may be available.

• **ETO Incentives.** Currently working with the Energy Trust of Oregon to identify energy efficiency incentives for the project.

• **Loans.** Currently discussing loan funding with multiple agencies.
Schedule and Next Steps
Sweet Home WWTP
## Overall Project Schedule

### Sweet Home WWTP Overall Project Schedule

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Current Date: [Project Completion June 2023]
Next Steps

• Proposed Public Process:
  • Public Hearings on March 26th and April 9th
  • City Council Decision to proceed with project on April 23rd

• Finalize Schematic Design (USDA PER & ER)

• Contigff*fc=nue coordination with Oregon DEQ on NPDES Permit
  • Anti-degradation Evaluation for Mass Load Increase
  • Work to get NPDES Permit Renewal on DEQ Schedule

• Continue work to determine project funding (USDA, DEQ, etc.)

• Update rates and SDCs

• Proceed with final design in June
  • Murraysmith final design & CM proposal to be provided in May
Questions?