

## CITY OF BEND COLLECTION SYSTEM MASTER PLAN CITY PROJECT NO. SW12AA

**VOLUME 6 OF 6**  
DECEMBER 2014

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**APPENDIX 7A**  
**Flow Monitoring Program**

## **APPENDIX 7A**

### **FLOW MONITORING PROGRAM**

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The Flow Monitoring Program consists of recommended temporary and permanent flow metering sites that will help the City of Bend (City) to recognize when key Capital Improvement Program (CIP) projects are required and to enable the hydraulic model calibration to be verified and updated periodically.

For the purpose of collecting model calibration data, flow meter sites were selected to ensure all major branch sewers and locations of specific interest would be sampled. These sites are shown in Figure 7A-1 as permanent locations. The selected sites were based on locations shown to be effective in past flow metering projects and new locations (such as CMH000206) that were determined to be important for use in calibrating the hydraulic model, understanding the distribution of infiltration and inflow in the system, and to determine when improvements are needed based on actual flows.

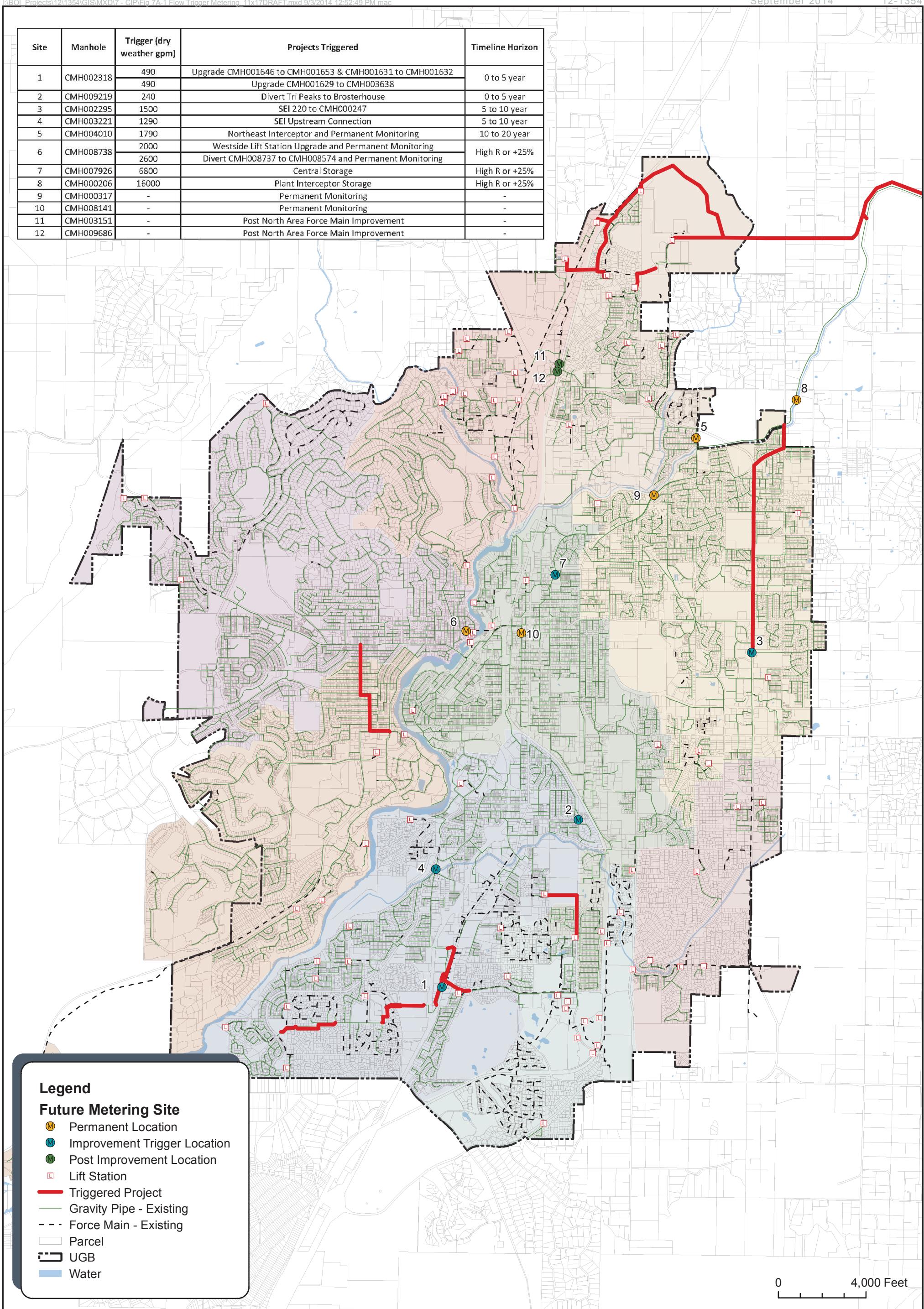
For the purpose of collecting flow data to help the City recognize when key CIP projects are required, the CSMP team:

1. Reviewed each major CIP project (beyond the 3-year horizon, including projects identified for flows beyond the 20-year horizon) to determine the critical point in the model at which performance criteria is first violated without the CIP in place.
2. Ran the hydraulic model for the planning horizon recommended for the project, but without the project included. This enabled observation of the flow rate at which the network deficiency first occurred.
3. Determined the flow rates at which the dry weather flow criteria was breached, and the flow rate at which the wet weather flow criteria was breached.
4. Determined the critical dry weather flow (flow trigger) that corresponds to a breach in criteria. This is calculated as the minimum of either the surcharged capacity of the pipeline divided by the peak wet to peak dry flow factor at the trigger location, or the 0.8 d/D capacity.

Figure 7A-1 shows the proposed permanent and temporary flow meter sites, and presents a summary table of the flow triggers for each key CIP project.

It is important to note that flow trigger is defined as the flow rate at which performance criterion is breached. Ideally, the associated triggered project would be commissioned prior to the flow trigger being reached. When this does not occur, the flow monitor location should be used to gauge how much excess capacity is available to limit pending connections (from new developments and/or realignment of the existing system) prior to the associated CIP project being undertaken.

Site	Manhole	Trigger (dry weather gpm)	Projects Triggered	Timeline Horizon
1	CMH002318	490	Upgrade CMH001646 to CMH001653 & CMH001631 to CMH001632	0 to 5 year
		490	Upgrade CMH001629 to CMH003638	
2	CMH009219	240	Divert Tri Peaks to Brosterhouse	0 to 5 year
3	CMH002295	1500	SEI 220 to CMH000247	5 to 10 year
4	CMH003221	1290	SEI Upstream Connection	5 to 10 year
5	CMH004010	1790	Northeast Interceptor and Permanent Monitoring	10 to 20 year
6	CMH008738	2000	Westside Lift Station Upgrade and Permanent Monitoring	High R or +25%
		2600	Divert CMH008737 to CMH008574 and Permanent Monitoring	
7	CMH007926	6800	Central Storage	High R or +25%
8	CMH000206	16000	Plant Interceptor Storage	High R or +25%
9	CMH000317	-	Permanent Monitoring	-
10	CMH008141	-	Permanent Monitoring	-
11	CMH003151	-	Post North Area Force Main Improvement	-
12	CMH009686	-	Post North Area Force Main Improvement	-





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**APPENDIX 7B**  
**CIP Project Cutsheets**

## **APPENDIX 7B**

### **CIP PROJECT CUTSHEETS**

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This appendix presents the Capital Improvement Program (CIP) project cutsheets. Each cutsheet includes information and figures describing the proposed project. These CIP cutsheets provide additional detail and context for each project as they progress from planning to actual construction.

As applicable, each project cutsheet includes the following information:

- Project ID: Unique identification number designated for the project
- Project Name: Unique name of the project
- From: Upstream location of the project
- To: Downstream location of the project
- Project Category: Classification or reason for project (e.g. Hydraulic Capacity)
- Implementation Timeframe: Period of time the project will be carried out
- Objective: Purpose of the project
- Description: Explanation of the project
- Required Preceding and Concurrent Projects: Other projects that must be complete before or at the same time as the project to ensure that collection system operates properly
- Other Dependent Projects: Other projects that can be completed after the project is implemented
- Special Considerations: Atypical issues that are significant and specific to the project
- Type of Construction: Method used to complete project
- Units: Length (feet) or size (required flow or horsepower) of the project
- Diameter: Pipe size
- Project Estimate: The opinion of project costs based on planning level preliminary estimates for the year 2013

# City of Bend Collection System Master Plan Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

Project ID: 1A

Project Name: SEI Phase I Connection Downstream

From: SEI MH 220

To: CMH002295

Project Category: Hydraulic Capacity

Implementation

Timeframe: 1 to 3 Year

Objective: Interim connection of the downstream end of SEI Phase 1 to the existing connection system. Allows Phase 2 of the SEI to be deferred.

Description: New 12-inch pipe connecting the downstream end of SEI Phase I to the existing 15-inch trunk along 27th Street, at manhole CMH002295.

Required Preceding  
Projects: -

Required Concurrent  
Projects: 1B, 2, 3

Other Dependent Projects: 1B, 15, 3, 2, 19A and 19B, 20, 13A and 13B, 14A and 14B, 16A and 16B, 17A and 17B, 18A and 18B

Special Considerations: In contrast to the SEI, this project has not been designed.  
Intertie between SEI Phase 1 and existing collection system at this location is to be abandoned when SEI Phase 2 is constructed.

Project ID	Type of Improvement	Unit	Diameter	From	To
1A	Trenched Gravity Sewer	400 LF	12-inch	SEI Phase 1	CMH002295

**Total Project Estimate** \$133,000

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



# City of Bend Collection System Master Plan

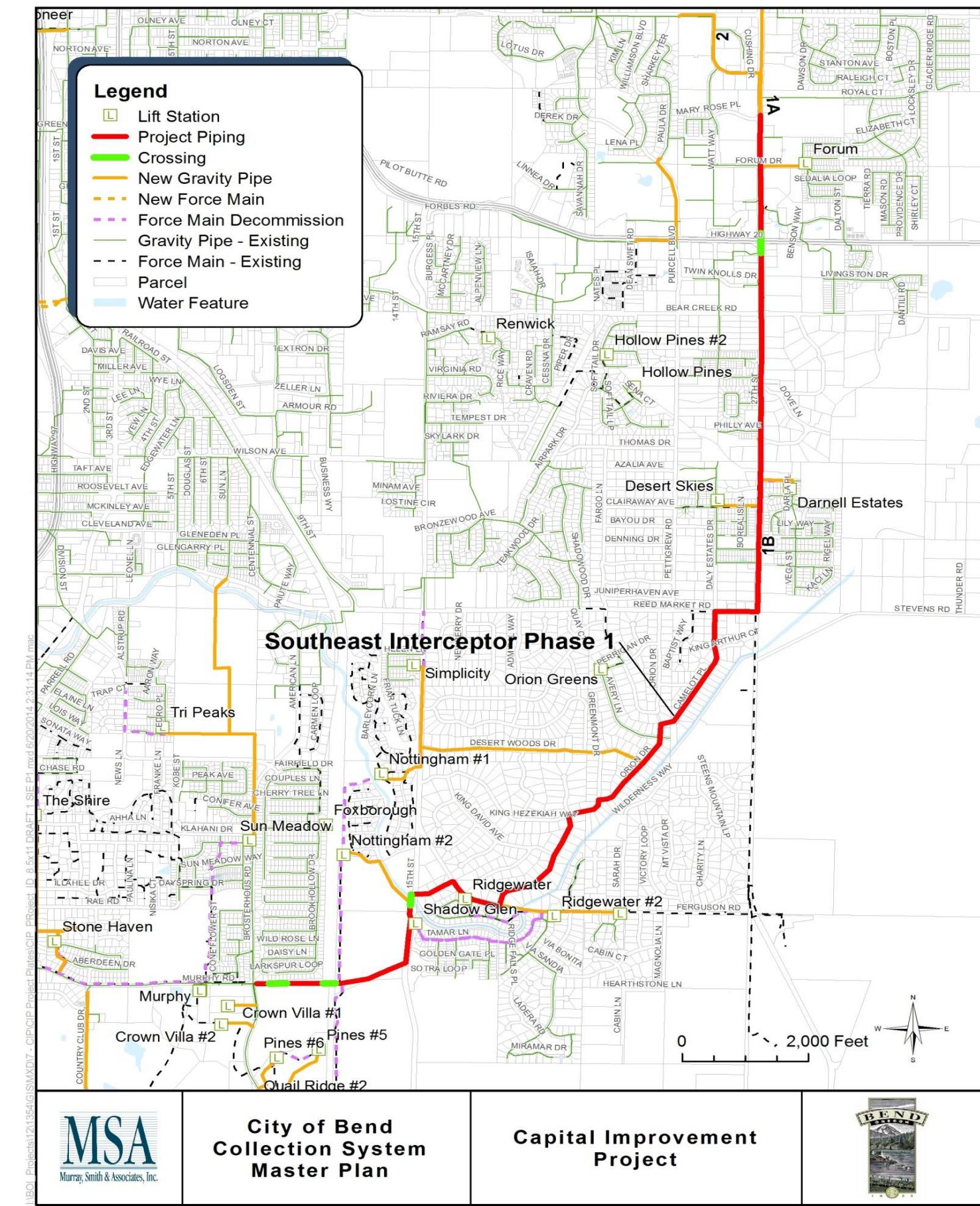
## Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

Project ID: 1B

<b>Project Name:</b>	<b>SEI Phase I</b>
From:	CMH009513
To:	Project ID 1A
Project Category:	Hydraulic Capacity
Implementation	
Timeframe:	1 to 3 Year
Objective:	<p>This improvement provides additional conveyance capacity, allowing flow to be diverted away from hydraulically deficient infrastructure in the existing southeast and central portions of the collection system. It enables city-owned lift stations to be decommissioned and also allows for service to currently unsewered properties within the UGB.</p>
Description:	<p>The Phase 1 portion of the SEI consists of three segments of new gravity sewer. The first segment is an 18-inch diameter line extending cross-country from the intersection of Murphy Road and Brosterhous Road to 15th St. The second segment is a 24-inch diameter pipe along 15th Street to Chloe Lane, then east along Chloe Lane to Ferguson Road, then east along Ferguson Road to King Solomon Lane, then north along King Solomon Lane to King David Avenue. The last segment is a 30-inch pipe along King Solomon Lane to Orion Drive, then north along Orion Drive to Camelot Place, then along Camelot Place to Reed Market Road, then east along Reed Market Road to 27th Street, then north along 27th Street to Mary Rose Place where it will connect to Project 1A.</p>
Required Preceding Projects:	-
Required Concurrent Projects:	1A, 2, 3
Other Dependent Projects:	15, 1A, 3, 2, 19A and 19B, 61A and 61B, 20, 13A and 13B, 14A and 14B, 16A and 16B, 17A and 17B, 18A and 18B, 65A and 65B, 66A and 66B, 62A and 62B, 67A and 67B, 63A and 63B, 64A and 64B, 60B, 97A and 97B, 92A and 92B, 88A and 88B, 96A and 96B, 90A and 90B, 95A and 95B, 94A and 94B, 91A and 91B, 89A and 89B, 93A and 93B, 87
Special Considerations:	<p>Trenchless construction (east of Brosterhous Road), railroad crossing (east of Brosterhous Road), canal crossing (COID Canal) and Highway crossing (Highway 20).</p> <p>This project has been designed by a City consultant.</p>
Continued on next page...	



Project ID	Type of Improvement	Unit	Diameter	From	To
1B	Trenched Gravity Sewer	2,500 LF	18-inch	CMH009513	SEI MH 512
1B	Trenchless Construction	200 LF	18-inch		
1B	Trenchless Railroad Crossing	300 LF	18-inch		
1B	Trenched Gravity Sewer	3,500 LF	24-inch	SEI MH 512	SEI MH 426
1B	Trenchless Canal Crossing	200 LF	24-inch		
1B	Trenched Gravity Sewer	14,800 LF	30-inch	SEI MH 426	Project ID 1A
1B	Trenchless Railroad Crossing	200 LF	30-inch		
<b>Total Project Estimate</b>		<b>\$19,548,000</b>			

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.

# City of Bend Collection System Master Plan Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

Project ID: 2

Project Name: Parallel Line on Medical Center Drive

From: CMH002295

To: CMH002503

Project Category: Hydraulic Capacity

Implementation

Timeframe: 1 to 3 Year

Objective: Provides additional capacity for the interim connection of SEI Phase 1 to the existing collection system and defers investment in SEI Phase 2.

Description: Parallel 12-inch line to an existing 15-inch line along 27th Street from approximately 300 feet north of Mary Rose Place to Medical Center Drive, then along Medical Center Drive to Neff Road, then west along Neff Road approximately 600 feet.

Required Preceding  
Projects: -

Required Concurrent  
Projects: 1B, 1A, 3

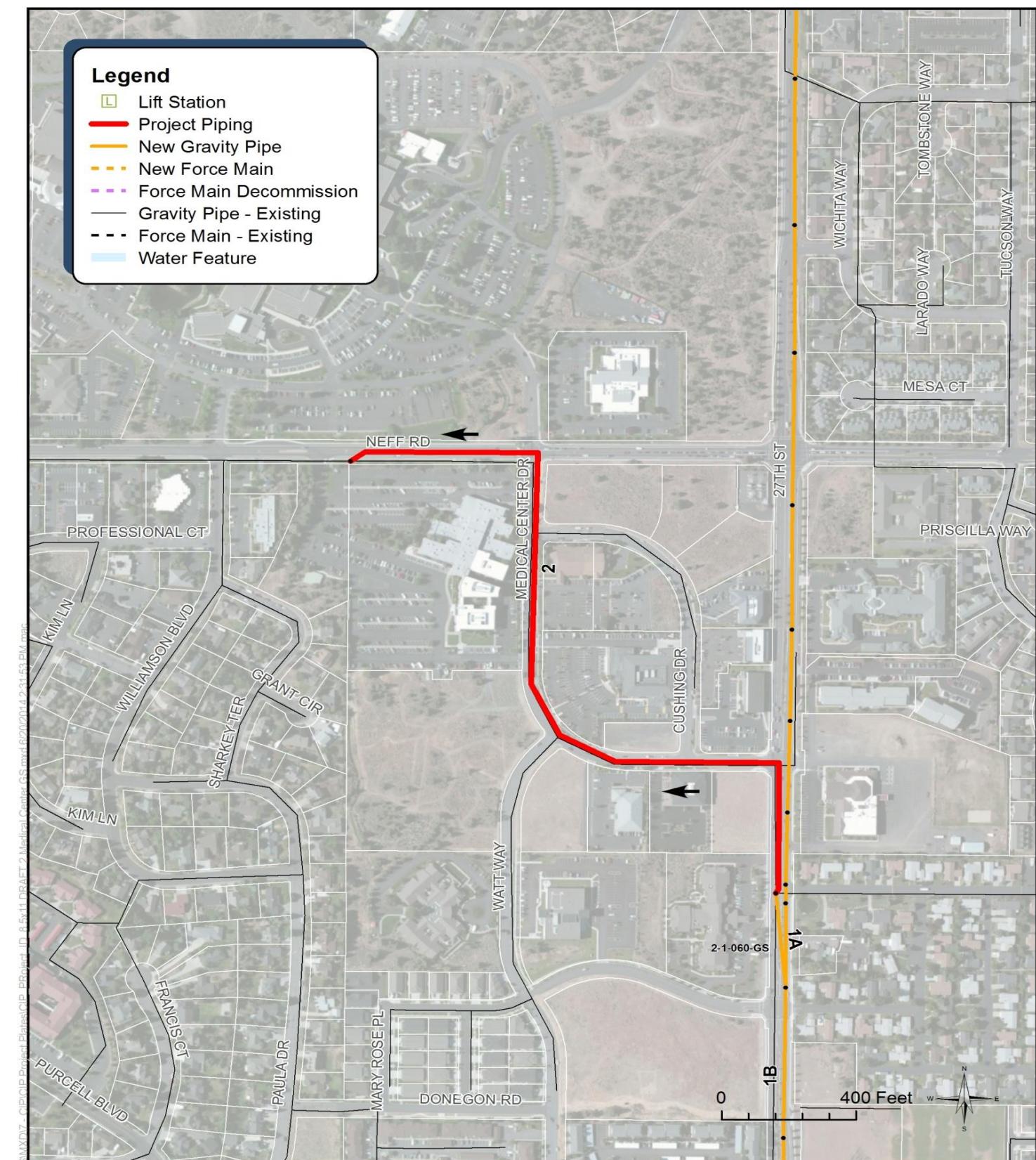
Other Dependent Projects: 1B, 15, 3, 19A and 19B, 20, 13A and 13B, 14A and 14B, 16A and 16B, 17A and 17B, 18A and 18B

Special Considerations: In contrast to the SEI, this project has not been designed. The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
2	Trenched Gravity Sewer	2,700 LF	12-inch	CMH002295	CMH002503

**Total Project Estimate** \$1,112,000

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



**City of Bend  
Collection System  
Master Plan**

**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 3

Project Name: SEI Phase 1 Connection Upstream

From: CMH007048

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 1 to 3 Year

Objective: Connection of the existing system to the SEI Phase 1.

Description: New 8-inch line along 27th Street at the intersection of Chilliwack Way from existing 8-inch gravity sewer to new 30-inch gravity sewer (SEI Phase 1).

Required Preceding

Projects: 1B, 1A, 2

Required Concurrent

Projects: -

Other Dependent Projects: -

Special Considerations: This project has been designed as part of the SEI. Cannot be constructed prior to SEI Phase 1.

Project ID	Type of Improvement	Unit	Diameter	From	To
3	Trenched Gravity Sewer	100 LF	8-inch	CMH007048	SEI MH

**Total Project Estimate** \$38,000

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*



June 2014

12-1354

**City of Bend  
Collection System  
Master Plan**

**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 4A, 4B, 4C, and 4D

Project Name: Colorado Lift Station

From: Various, See Figure

To: Various, See Figure

Project Category: Hydraulic Capacity

Implementation

Timeframe: 1 to 3 Year

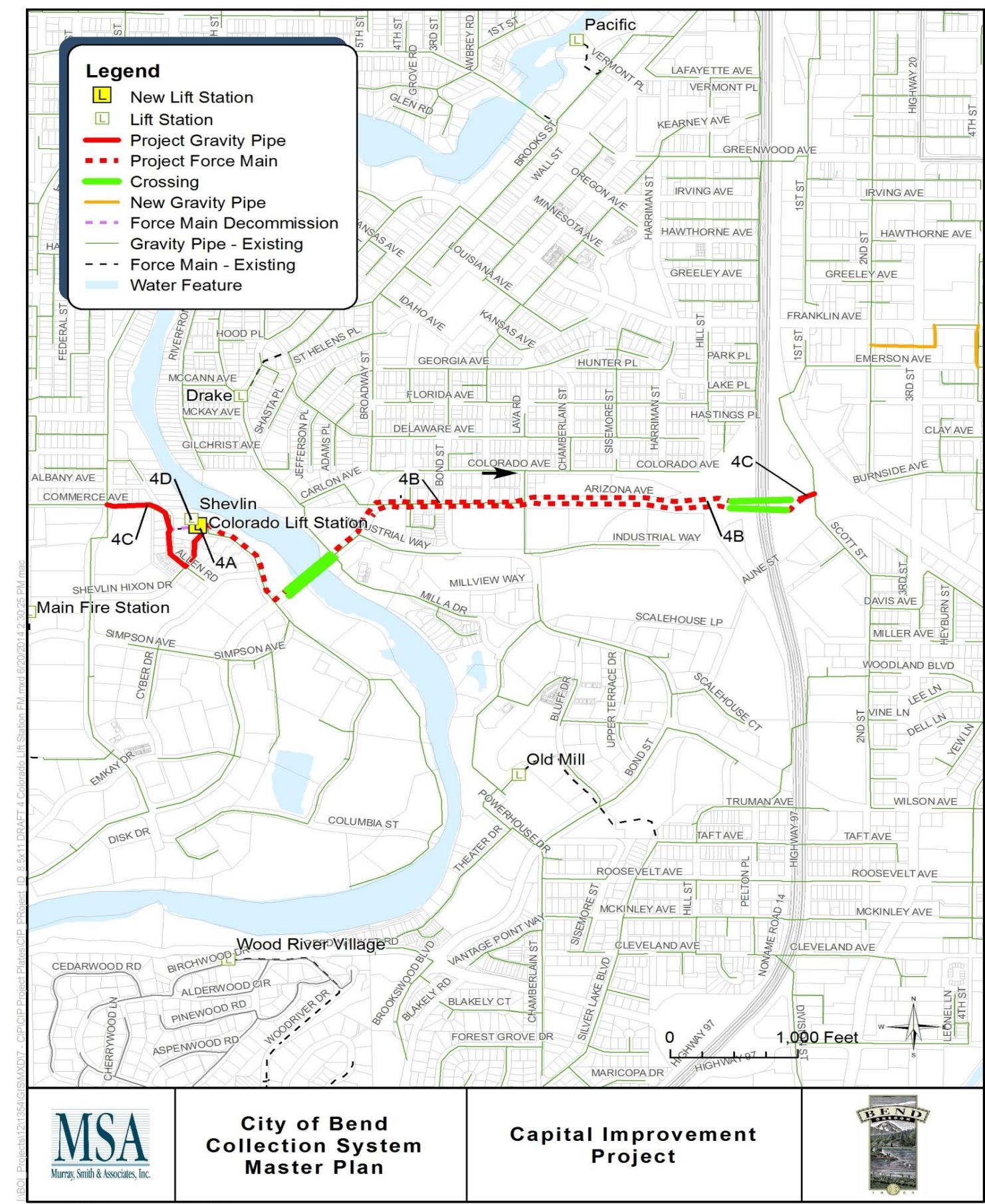
Objective: This new lift station will provide service to future developments on the west side of the City, address existing capacity, access and odor issues at Shevlin Lift Station, and defer capacity-related improvements at Westside Lift Station.

Description: Lift Station: New lift station facility (Project 4A) with a total capacity of 2,800 gpm.

Force Main: New parallel 12-inch force mains (Project 4B) going cross-country 140 feet southeast from new Colorado Lift Station (located 300 feet southeast of Commerce Avenue and Allen Road intersection) to Shevlin Hixon Drive, then along Shevlin Hixon Drive to Colorado Avenue, then along Colorado Avenue to Arizona Avenue, then along Arizona Avenue to Colorado Avenue, then along Colorado Avenue to Scott Street, then along Scott Street to Highway 97 on-off ramp to new 18-inch gravity sewer at Scott Street and Highway 97 on-off ramp intersection. Force main includes river crossing along Colorado Avenue. Discharge to new gravity sewer east of Highway 97.

Gravity Sewer: First segment of Project 4C is a new 18-inch line paralleling the existing 8-inch gravity sewer along Commerce Avenue from Columbia Street to Allen Road, then along Allen Road to Shevlin Hixon Drive, then along Shevlin Hixon Drive and cross-country to new Colorado Lift Station (located 300-feet southeast of Commerce Avenue and Allen Road intersection). The second segment of Project 4C is a new 18-inch gravity line that connects the new dual 12-inch force mains (Project 4B) to the existing gravity 24-inch gravity sewer 100-feet northeast of the Scott Street and Highway 97 on-off ramp intersection. This section of gravity main connects to gravity sewer CGM008617 at new manhole. The ultimate size of the Colorado Lift Station's catchment is dependent on how far the upstream gravity sewer is extended. The current design provides flexibility to divert flows (if additional piping were constructed) from existing piping on Newport Avenue, providing operational flexibility and redundancy for the Westside Lift Station if desired.

Decommission: The decommissioning of Shevlin Lift Station (Project 4D) process includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.



Required Preceding Projects:	-																																																																																																						
Required Concurrent Projects:	-																																																																																																						
Other Dependent Projects:	-																																																																																																						
Special Considerations:	Force main includes river crossing and railroad/highway crossing. Project has been designed by a City consultant.																																																																																																						
<table border="1"> <thead> <tr> <th>Project ID</th><th>Type of Improvement</th><th>Unit</th><th>Diameter</th><th>From</th><th>To</th></tr> </thead> <tbody> <tr> <td>4A</td><td>New Lift Station</td><td>131 HP</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td colspan="6"><b>Total New Lift Station Estimate</b></td></tr> <tr> <td>4B</td><td>Trenched Force Main</td><td>4,800 LF</td><td>12-inch</td><td>Lift Station</td><td>4C GS</td></tr> <tr> <td>4B</td><td>Trenched Force Main</td><td>4,800 LF</td><td>12-inch</td><td>Lift Station</td><td>4C GS</td></tr> <tr> <td>4B</td><td>River Crossing</td><td>300 LF</td><td>12-inch</td><td>-</td><td>-</td></tr> <tr> <td>4B</td><td>River Crossing</td><td>300 LF</td><td>12-inch</td><td>-</td><td>-</td></tr> <tr> <td>4B</td><td>RR/HWY Crossing</td><td>500 LF</td><td>12-inch</td><td>-</td><td>-</td></tr> <tr> <td>4B</td><td>RR/HWY Crossing</td><td>500 LF</td><td>12-inch</td><td>-</td><td>-</td></tr> <tr> <td colspan="6"><b>Total Force Main Estimate</b></td></tr> <tr> <td>4C</td><td>Trenched Gravity Sewer</td><td>600 LF</td><td>18-inch</td><td>CMH008574</td><td>New MH</td></tr> <tr> <td>4C</td><td>Trenched Gravity Sewer</td><td>900 LF</td><td>18-inch</td><td>New MH</td><td>Lift Station</td></tr> <tr> <td>4C</td><td>Trenched Gravity Sewer</td><td>100 LF</td><td>18-inch</td><td>FM Discharge</td><td>CGM008617</td></tr> <tr> <td colspan="6"><b>Total Gravity Piping Estimate</b></td></tr> <tr> <td>4D</td><td>Lift Station Decommission</td><td>1 EA</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td colspan="6"><b>Total Lift Station Decommission Estimate</b></td></tr> <tr> <td colspan="6"><b>Total Project Estimate</b></td></tr> </tbody> </table>		Project ID	Type of Improvement	Unit	Diameter	From	To	4A	New Lift Station	131 HP	-	-	-	<b>Total New Lift Station Estimate</b>						4B	Trenched Force Main	4,800 LF	12-inch	Lift Station	4C GS	4B	Trenched Force Main	4,800 LF	12-inch	Lift Station	4C GS	4B	River Crossing	300 LF	12-inch	-	-	4B	River Crossing	300 LF	12-inch	-	-	4B	RR/HWY Crossing	500 LF	12-inch	-	-	4B	RR/HWY Crossing	500 LF	12-inch	-	-	<b>Total Force Main Estimate</b>						4C	Trenched Gravity Sewer	600 LF	18-inch	CMH008574	New MH	4C	Trenched Gravity Sewer	900 LF	18-inch	New MH	Lift Station	4C	Trenched Gravity Sewer	100 LF	18-inch	FM Discharge	CGM008617	<b>Total Gravity Piping Estimate</b>						4D	Lift Station Decommission	1 EA	-	-	-	<b>Total Lift Station Decommission Estimate</b>						<b>Total Project Estimate</b>					
Project ID	Type of Improvement	Unit	Diameter	From	To																																																																																																		
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The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.

# City of Bend Collection System Master Plan

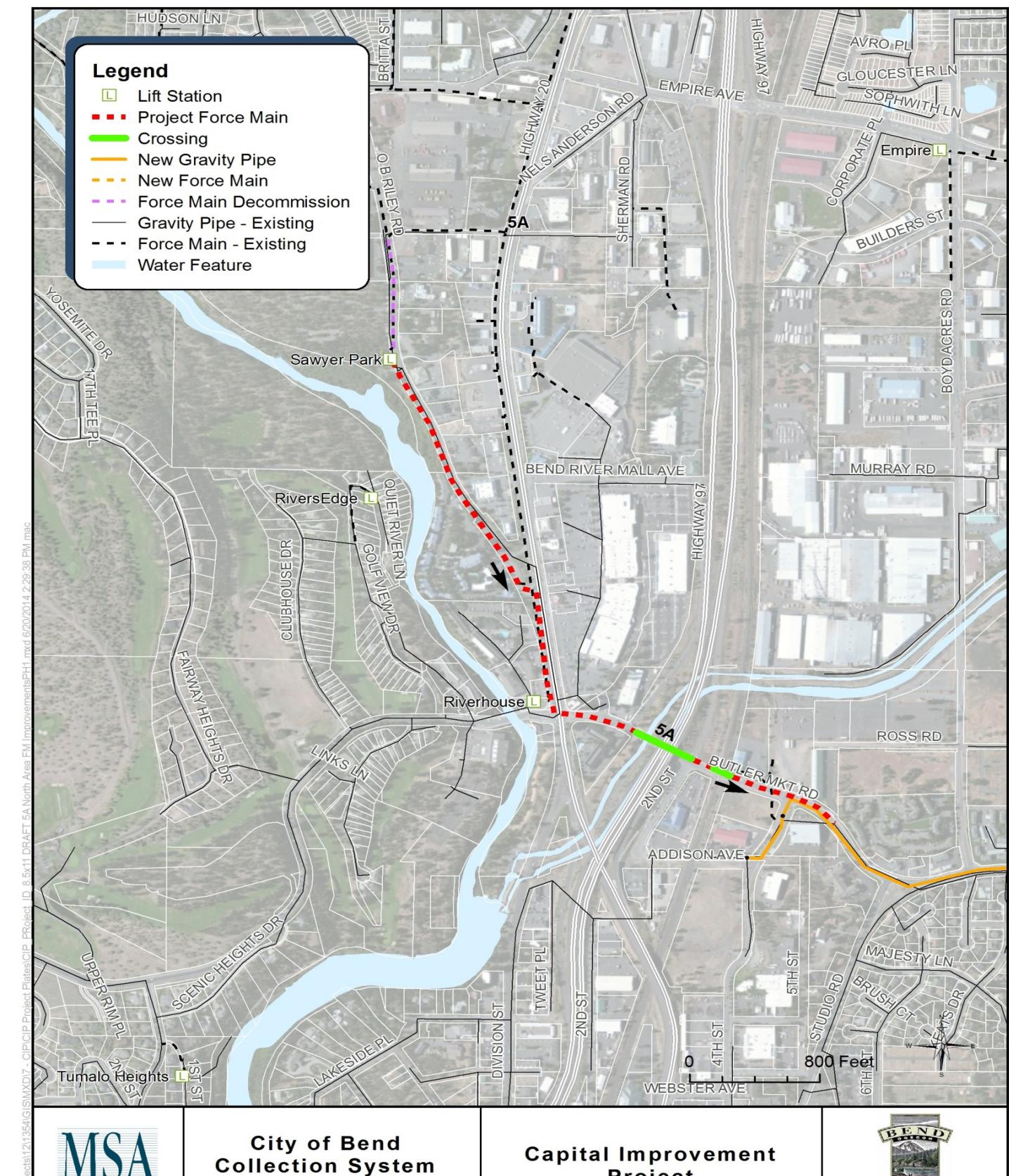
## Capital Improvement Project



Project ID:	5A				
Project Name:	New Sawyer Park Force Main				
From:	Sawyer Park Lift Station				
To:	CMH002251				
Project Category:	Hydraulic Capacity				
Implementation					
Timeframe:	1 to 3 Year				
Objective:	Improve the lift station operation and reduce flows in the North Area force main (common force main)				
Description:	<p>New 10-inch force main from Sawyer Park Lift Station along O B Riley Road to Highway 20, then along Highway 20 to Butler Market Road, then along Butler Market Road connecting to the existing gravity sewer at manhole CMH002251. Riverhouse Lift Station Force Main will be diverted to gravity sewer upstream of Sawyer Park in Highway 20.</p> <p>Wyndemere Lift Station force main will discharge to the gravity sewer at Mervin Sampels Road and Highway 97 (It will no longer flow through the combined force main going north from this location) and flow to the east. The remaining lift stations north of Wyndemere will continue to utilize the common force main in 3rd Street. The segment of the 3rd Street common force main south of Mervin Sampels Road will be isolated to serve as local sewer low pressure main for businesses on Highway 97 south of Mervin Samples discharging to the Sawyer Park Lift Station contributory gravity sewer.</p>				
Required Preceding Projects:	-				
Required Concurrent Projects:	5B				
Other Dependent Projects:	-				
Special Considerations:	<p>Force main includes canal, highway, and railroad crossing.</p> <p>Project 5A and 5B are currently in design to be completed in conjunction as discrete portions of one project to improve the collection system, increase conveyance capacity and relieve pressures in the overtaxed common pressure system along 3rd Street.</p>				
Project ID	Type of Improvement	Unit	Diameter	From	To
5A	Trenched Force Main	3,900 LF	10-inch	Sawyer Lift Station	CMH002251
5A	Trenchless Canal, Highway and Railroad Crossing	500 LF	10-inch	-	-
5A	Wyndemere Lift Station Force Main Discharge	1 EA	-		CMH00002

**Total Project Estimate** **\$1,481,000**

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



**City of Bend**  
Collection System  
Master Plan

**Capital Improvement  
Project**



MSA Project ID: 2013-0101-00002

June 2014

12-1354

# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 5B

Project Name: Gravity Sewer Replacement along Nels Anderson Road

From: CMH003157

To: CMH003150

Project Category: Hydraulic Capacity

Implementation

Timeframe: 1 to 3 Year

Objective: Increase the hydraulic conveyance capacity of the local sewer system to accommodate existing and future flows.

Description: New 12-inch gravity line to replace existing 8-inch line along Highway 97, then east cross-country to Nels Anderson Road, then along Nels Anderson Road to Fred Meyers Road intersection connecting to existing 15-inch gravity sewer. Project will remove siphon under communication utility.

Required Preceding Projects: -

Required Concurrent Projects:

5A

Other Dependent Projects: -

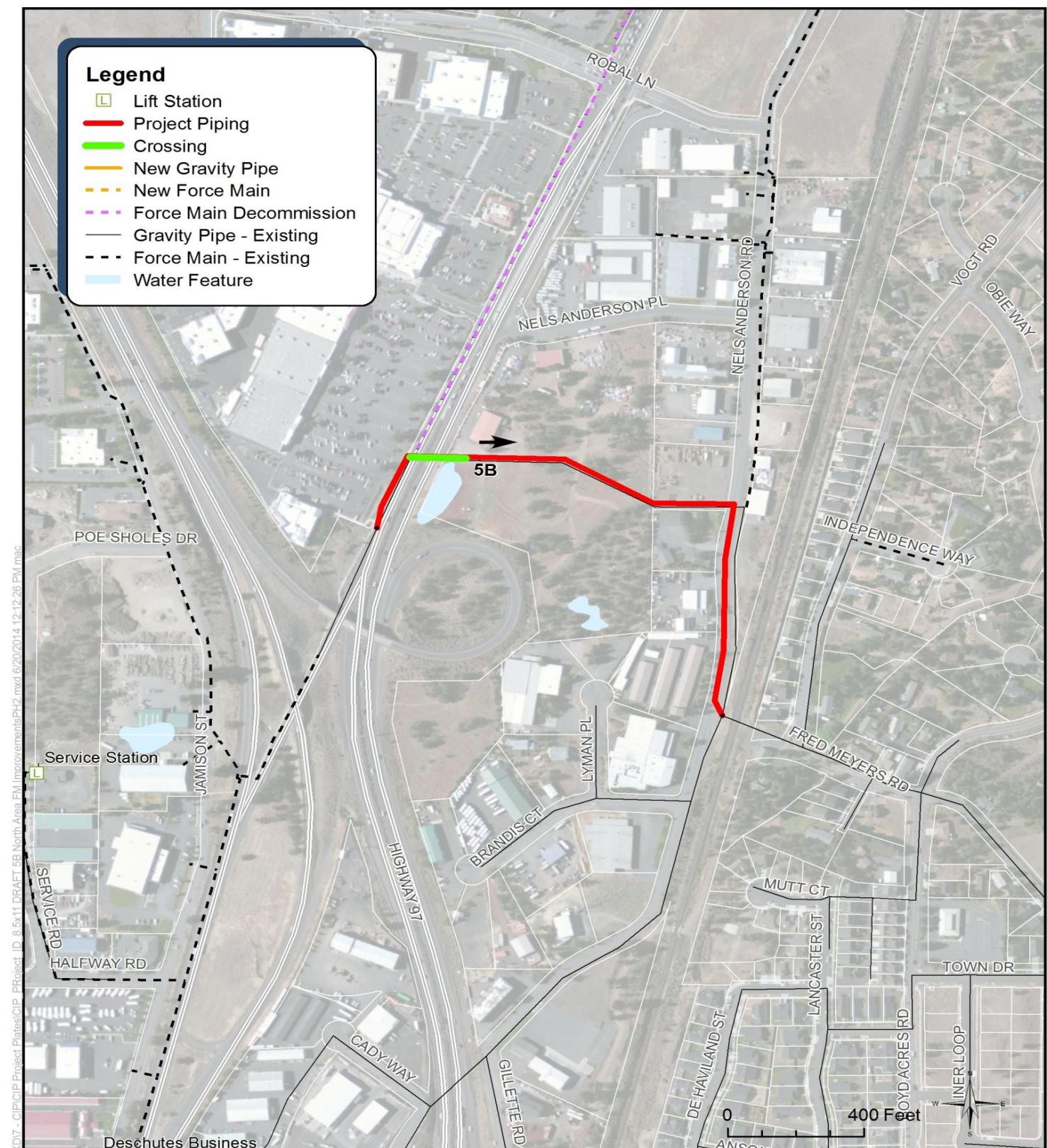
Special Considerations: Gravity pipeline includes highway crossing.

Project 5A and 5B are currently in design to be completed in conjunction as discrete portions of one project to improve the collection system, increase conveyance capacity and relieve pressures in the overtaxed common pressure system along 3rd Street.

Project ID	Type of Improvement	Unit	Diameter	From	To
5B	Trenched Gravity Sewer	1,800 LF	12-inch	CMH003157	CMH003150
5B	Trenchless Highway Crossing	200 LF	12-inch	-	-

**Total Project Estimate** \$1,037,000

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



**City of Bend  
Collection System  
Master Plan**

June 2014

12-1354

**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

Project ID: **6A, 6B and 6C**

Project Name: **Tri Peaks Northern Gravity Diversion**

From: Tri Peaks Lift Station

To: CMH005759

Project Category: Hydraulic Capacity

Implementation

Timeframe: 1 to 3 Year

Objective: This improvement allows the contributing area of Tri Peaks Lift Station to be served by gravity and an interim lift station. This improvement will serve future developments prior to the construction of the SEI Phase 2 when the interim lift station will be decommissioned.

Description: All piping and lift station constructed as part of this project is developer funded. New 8-inch gravity line from Tri Peaks Lift Station to interim Stone Creek Lift Station. The interim Stone Creek Lift Station will lift the sewage into a new gravity pipeline connecting to Herald Street existing 8-inch gravity line. Construction of a new Interim Stone Creek Lift Station by developer. The decommissioning of Tri Peaks Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: -

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Project is developer funded. Project includes COID canal crossing.

Project ID	Type of Improvement	Unit	Diameter	From	To
6A	Trenched Gravity Sewer	1,100 LF	8-inch	Tri Peaks Lift Station	Interim Stone Creek Lift Station
6A	Trenched Gravity Sewer	2,700 LF	8-inch	Interim Stone Creek Lift Station	CMH005759
6A	Trenchless Canal Crossing	200 LF	8-inch		

### Total Graviting Piping Estimate

**Developer Funded**

6B	New Lift Station	-	-	-	-
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### Total Lift Station Estimate

**Developer Funded**

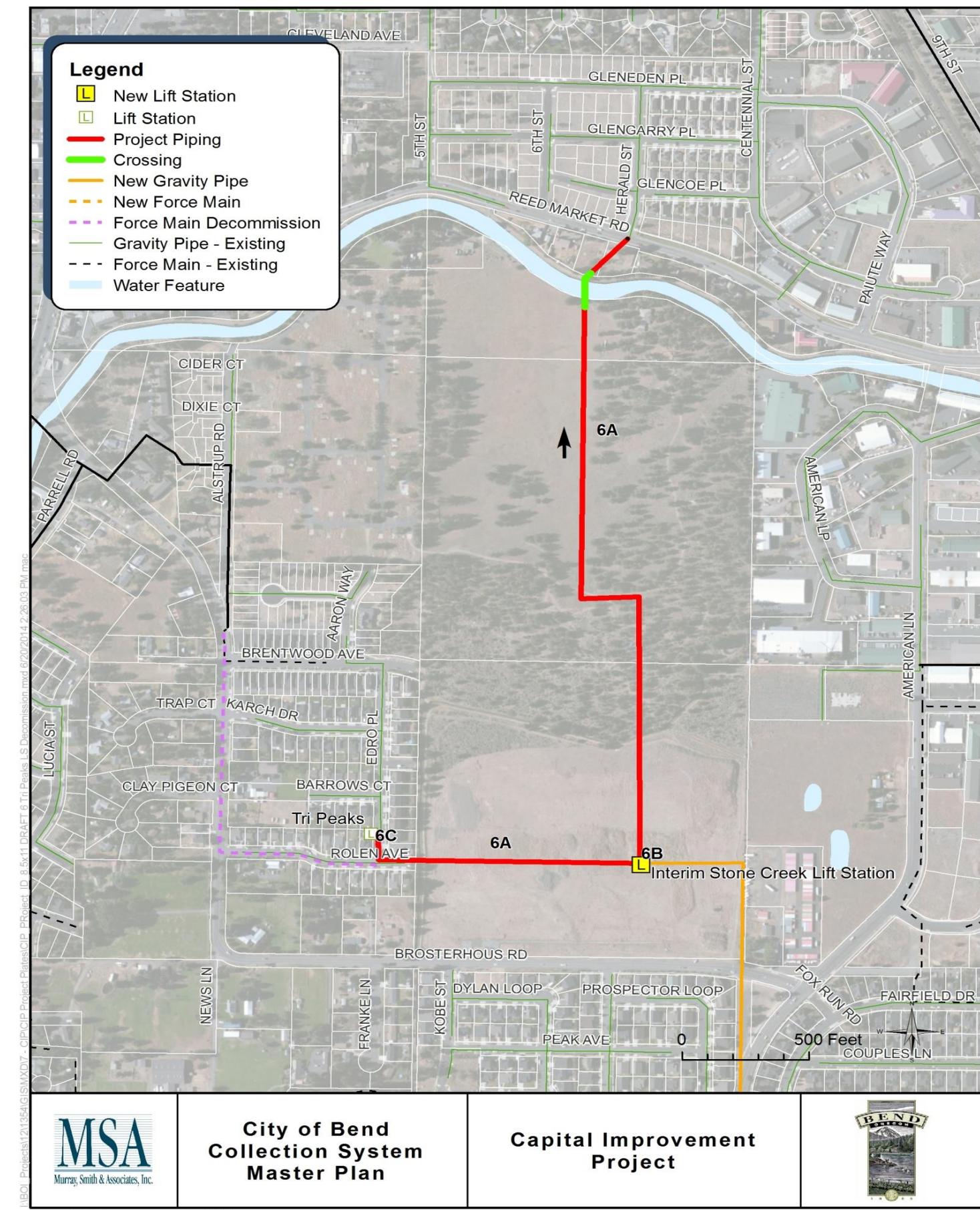
6C	Lift Station Decommission	1 EA	-	-	-
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### Total Decommission Estimate

**Developer Funded**

<b>Total Project Estimate</b>	<b>Developer Funded</b>
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The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that



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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 7A - 7E

Project Name: Plant Interceptor Rehabilitation

Location: Five segments along Plant Interceptor. See below for details.

Project Category: Improve Condition

Implementation

Timeframe: 1 to 3 Year

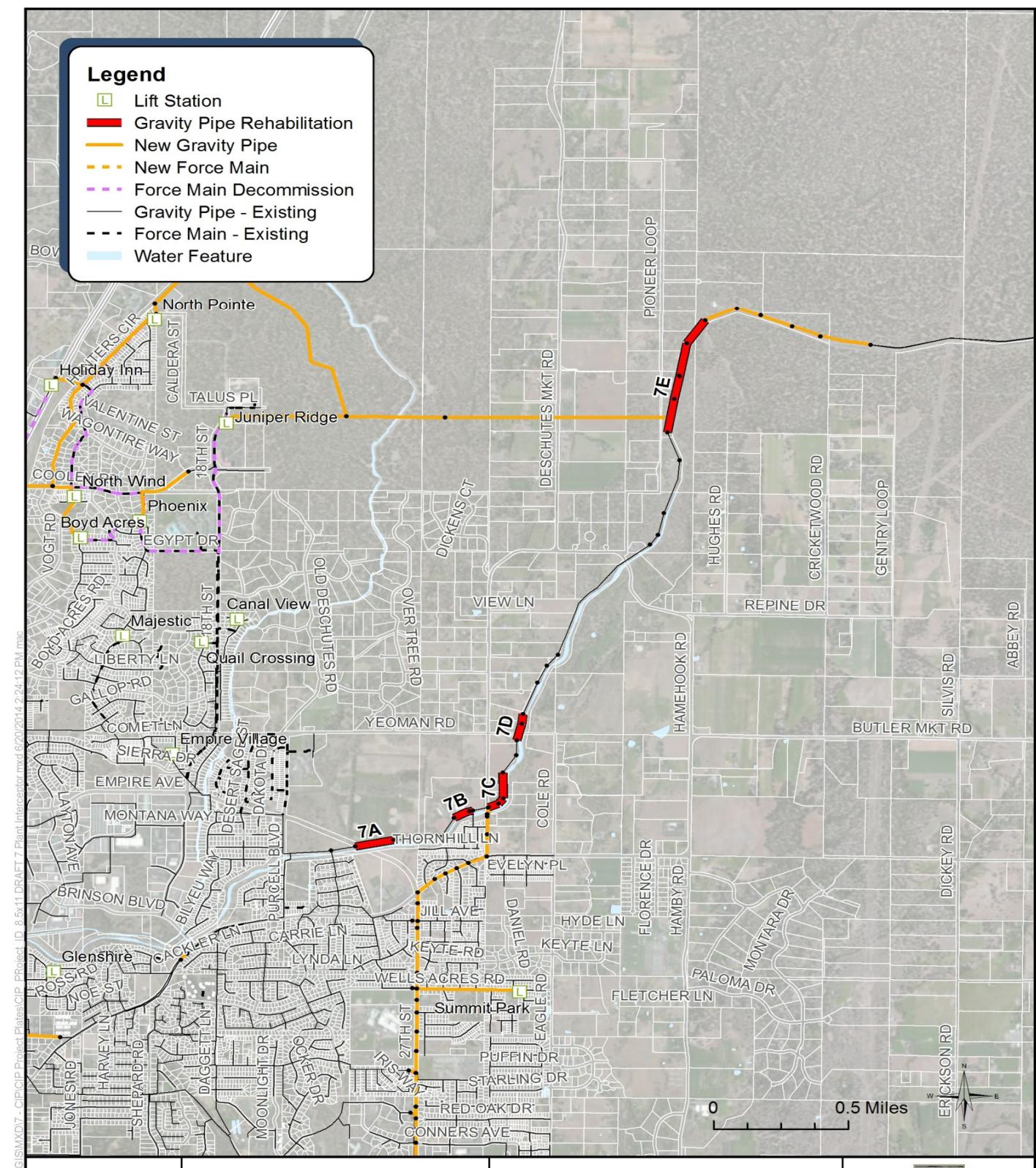
Objective: To address existing condition issues in the Plant Interceptor, avoid further deterioration and maintain existing conveyance capacity

Description: Based on a 2013 assessment of the Plant Interceptor condition, specific sections of pipe (classified as Grade 5 – imminent failure) were identified for rehabilitation using Cured-In-Place-Pipe (CIPP). Project Estimate not developed utilizing the Unit Costs from Section 5. Rather it was provided by City's Plant Interceptor Condition Consultant that was not involved in the CSMP.

Project ID	Type of Construction	Unit	Diameter	From	To
7A	Trenchless Rehabilitation	757 LF	42-inch	CMH000286	CMH000281
7B	Trenchless Rehabilitation	405 LF	36- to 42-inch	CMH000262	CMH0006824
7C	Trenchless Rehabilitation	920 LF	30- to 36-inch	CMH000247	CMH000207
7D	Trenchless Rehabilitation	590 LF	36-inch	CMH000205	CMH000203
7E	Trenchless Rehabilitation	2,602 LF	36- to 42-inch	CMH000186	CMG000181

**Total Project Estimate** \$5,400,000

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 8

Project Name: Large Gravity Main Condition Assessment Program - 1 to 5 year

Location: System Wide

Project Category: Miscellaneous Project

Implementation

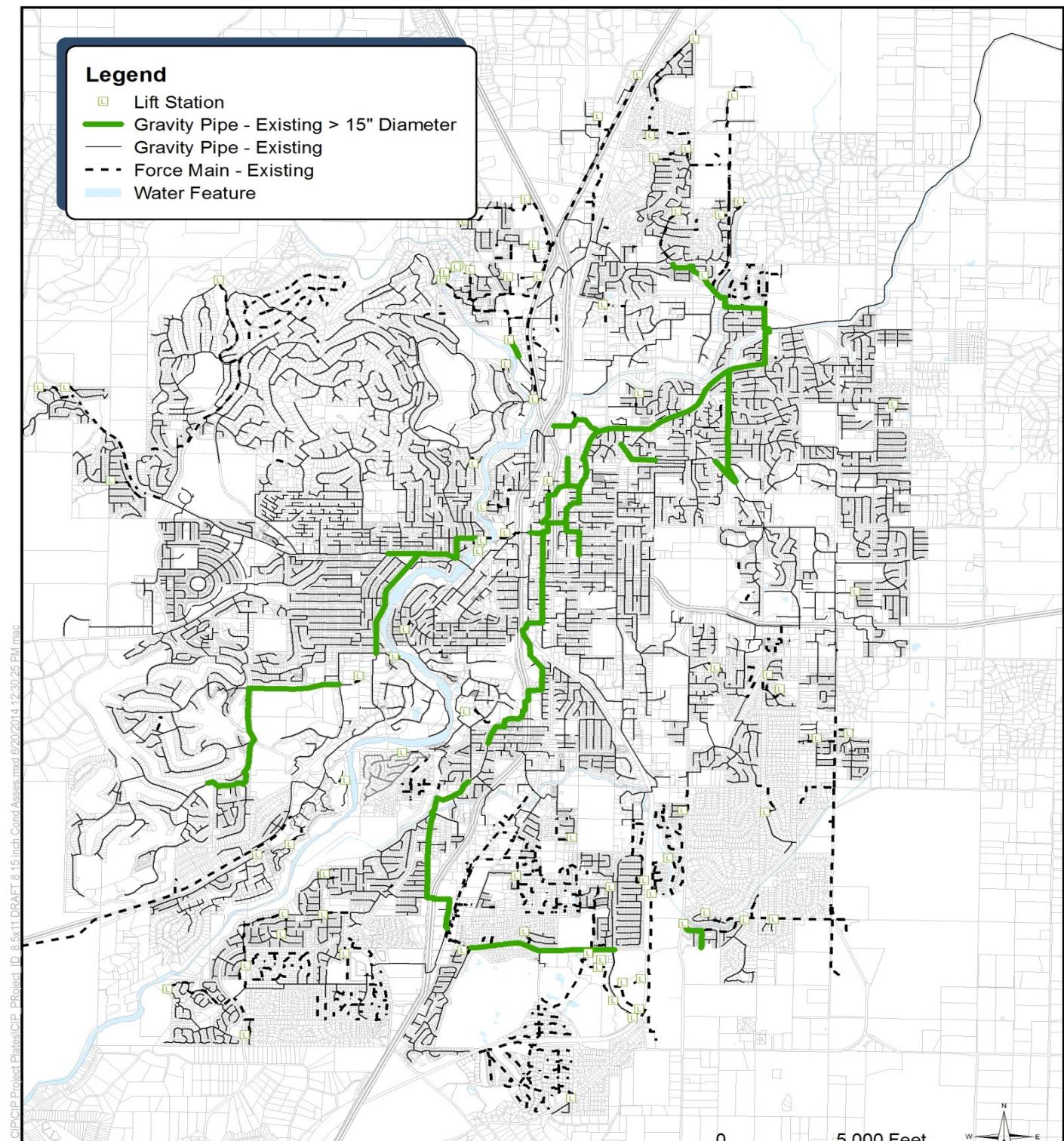
Timeframe: 1 to 5 Year

Objective: To evaluate the condition of the existing trunk system, grade system components and recommend repair or replacement where appropriate.

Description: Establish a program to inspect the condition of existing gravity trunk collection system with diameters greater than 15 inches (approximately 4% of the collection system), grade the trunk system components, evaluate rehabilitation options and recommend the most effective solution. This type of inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. This project does not include condition assessment of the Plant Interceptor or Inverted Siphon. Funding level is \$200,000 per year.

**Total Project Estimate** **\$1,000,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 9

Project Name: Flow Monitoring Program

Location: System Wide

Project Category: Miscellaneous Project

Implementation

Timeframe: 2 to 3 Year

Objective: Flow data gathering throughout the system. This program will allow the City to continue building a historical flow database and provide timing for future projects (Flow Triggers for various projects). This information will also serve as the foundation for future model calibration and system analysis. Flow Triggers consist of monitoring for sewage flow that when reached, signal the need for the project.

Description: Installation, calibration, and maintenance of permanent and temporary flow meter equipment.

The permanent meters will be located in the following manholes:

- CMH000206
- CMH000317
- CMH004010
- CMH008141
- CMH008738

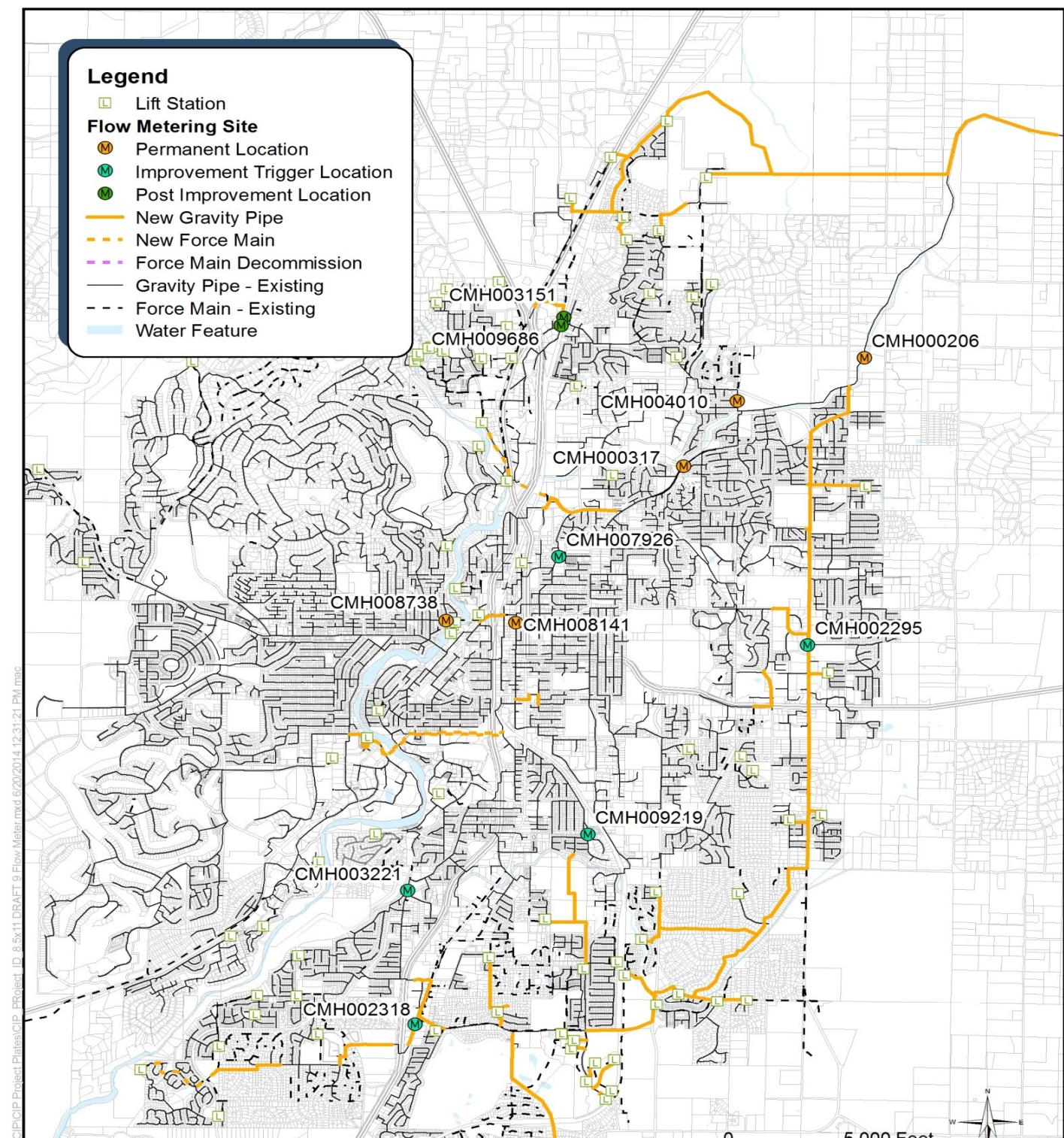
The temporary meters will be installed as required for specific projects.

Flow triggered projects include 22A, 22B, 22C, 22D, 60A, 60C and 61A. The Flow Monitoring Program is further described in Appendix 7-X of the Collection System Master Plan.

**Total Project Estimate**

\$287,000

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 10



<b>Project Name:</b>	<b>Plant Interceptor (Yeoman) Condition Assessment</b>
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	Year 1
Objective:	Identification of existing condition-related issues in the Plant Interceptor (Yeoman). Project consists of final pieces of the assessment: most of the Plant Interceptor assessment was completed by a City consultant in 2013.
Description:	Condition Assessment of the Plant Interceptor and Siphon. This inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. This project does not include condition assessment of the interceptors or gravity collection system away from the Plant Interceptor. City Project ID SW10AA.
<b>Total Project Estimate</b>	<b>\$184,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

**Project ID:** 11

<b>Project Name:</b>	<b>On-Call Hydraulic Modeling Services</b>
Location:	NA
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	3 to 5 year
Objective:	Maintaining an updated hydraulic model that accurately reflects existing conditions. Utilize the model for analyzing sewer flows and infrastructure needs.
Description:	Engineering services contract for use in maintaining the hydraulic sewer model. This contract will provide funds for a consultant to update the model piping and facilities, review and adjust the calibration, or run specific system analysis to identify required improvements or operational changes. This contract is intended to be utilized on an “as-needed” basis per City staff request.

**Total Project Estimate** \$300,000

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 12

Project Name: Valhalla Sewer Relocation and Odor Control Project

Location: Awbrey Glen Lift Station, Mount Washington Drive and Shevlin Park Road

Project Category: Improve Condition

Implementation

Timeframe: Year 1

Objective: Reduce odors in Valhalla neighborhood

Description: Project as identified by design consultant includes:

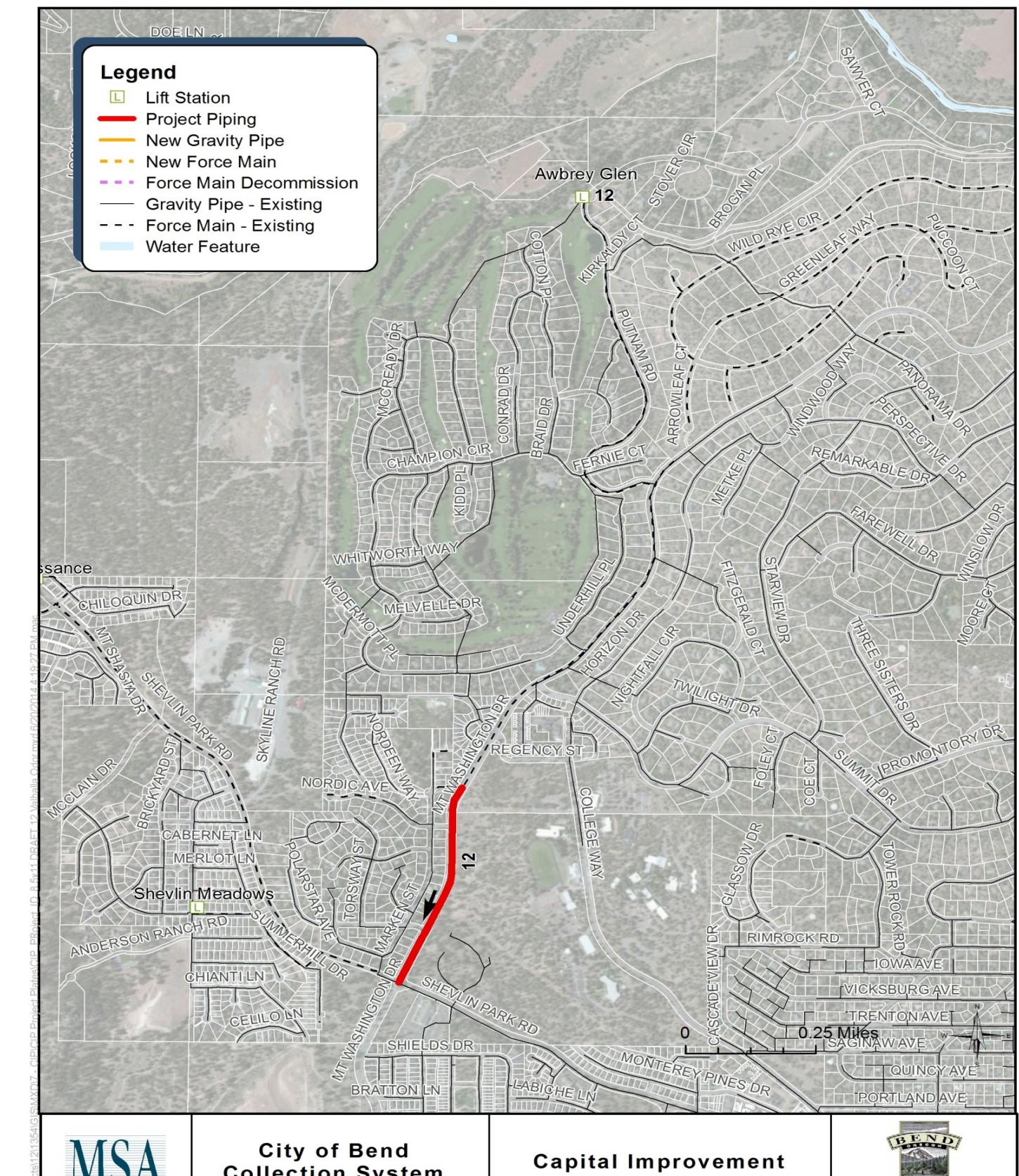
- Vapor phase treatment to capture/remove odor from the sewer headspace
- Relocation of Awbrey Glen Lift Station force main discharge to a new 15-inch sewer in Mount Washington Drive
- Liquid phase chemical treatment at Awbrey Glen Lift Station to remove and prevent the creation of odor producing compounds from the raw sewage

Project Estimate not developed utilizing the Unit Costs from Section 5. Rather it was provided by City's consultant that was not involved in the CSMP.

**Total Project Estimate**

**\$1,616,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 13A and 13B

Project Name: Crown Villa #1 Lift Station Decommission - Gravity Sewer Diversion

From: Crown Villa #1 Lift Station

To: CMH009549

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: This improvement allows the contributing area of Crown Villa #1 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from Crown Villa #1 Lift Station cross-country east to Brosterhous Road, connecting to existing 8-inch gravity sewer south of Brosterhous Road and Murphy Road intersection.

The decommissioning of Crown Villa #1 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 1A, 2

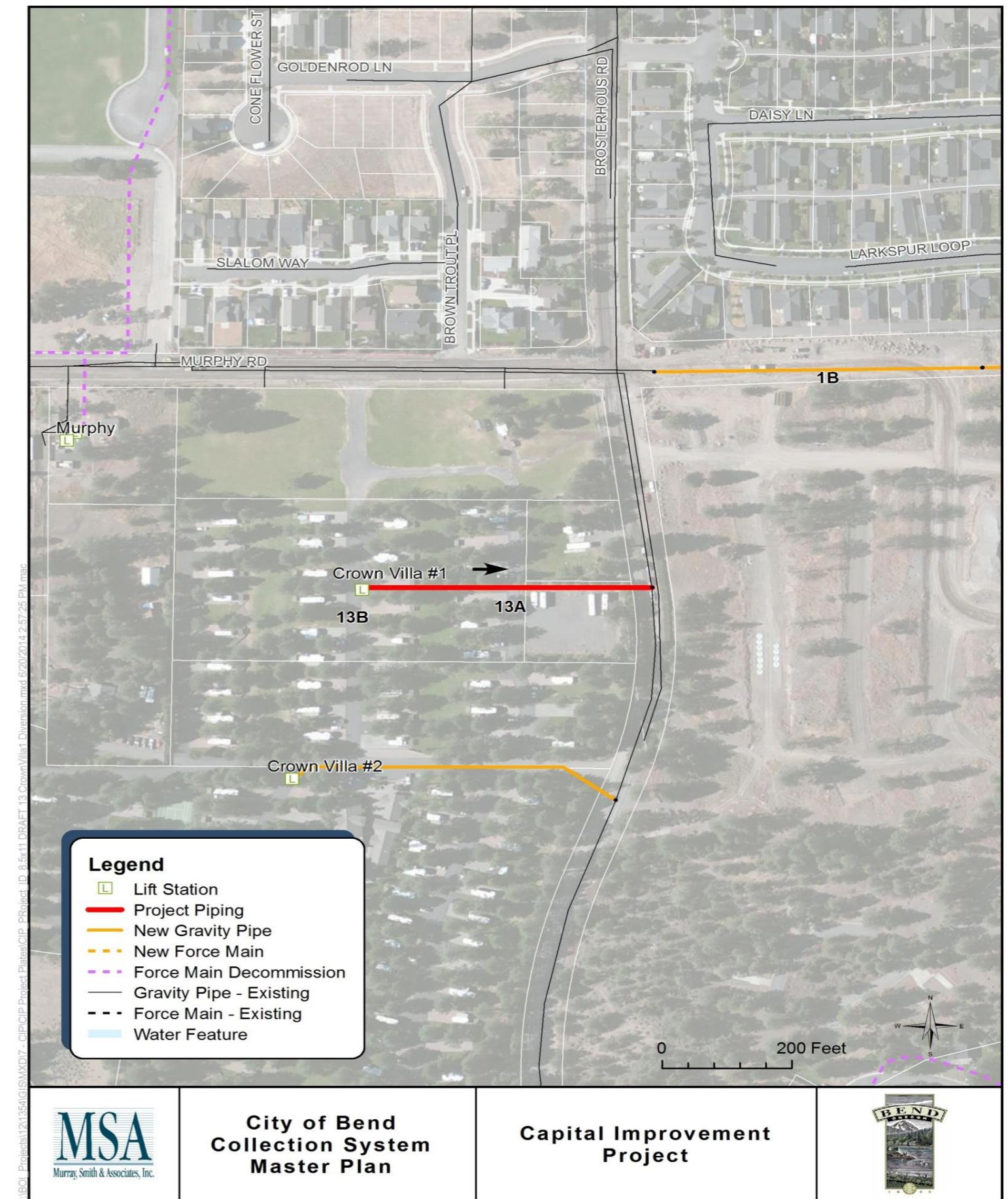
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 1.  
Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
13A	Trenched Gravity Sewer	500 LF	8-inch	Crown Villa #1 Lift Station	CMH009549
<b>Total Piping Estimate</b>					<b>\$103,000</b>
13B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$131,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 14A and 14B

Project Name: Crown Villa #2 Lift Station Decommission - Gravity Sewer Diversion

From: Crown Villa #2 Lift Station

To: CMH009552

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: This improvement allows the contributing area of Crown Villa #2 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity sewer along a private road between Crown Villa #2 Lift Station and 530 feet east to Brosterhous Rd, connecting to existing 8-inch gravity sewer south of Brosterhous Road and Murphy Road intersection. The decommissioning of Crown Villa #2 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 1A, 2

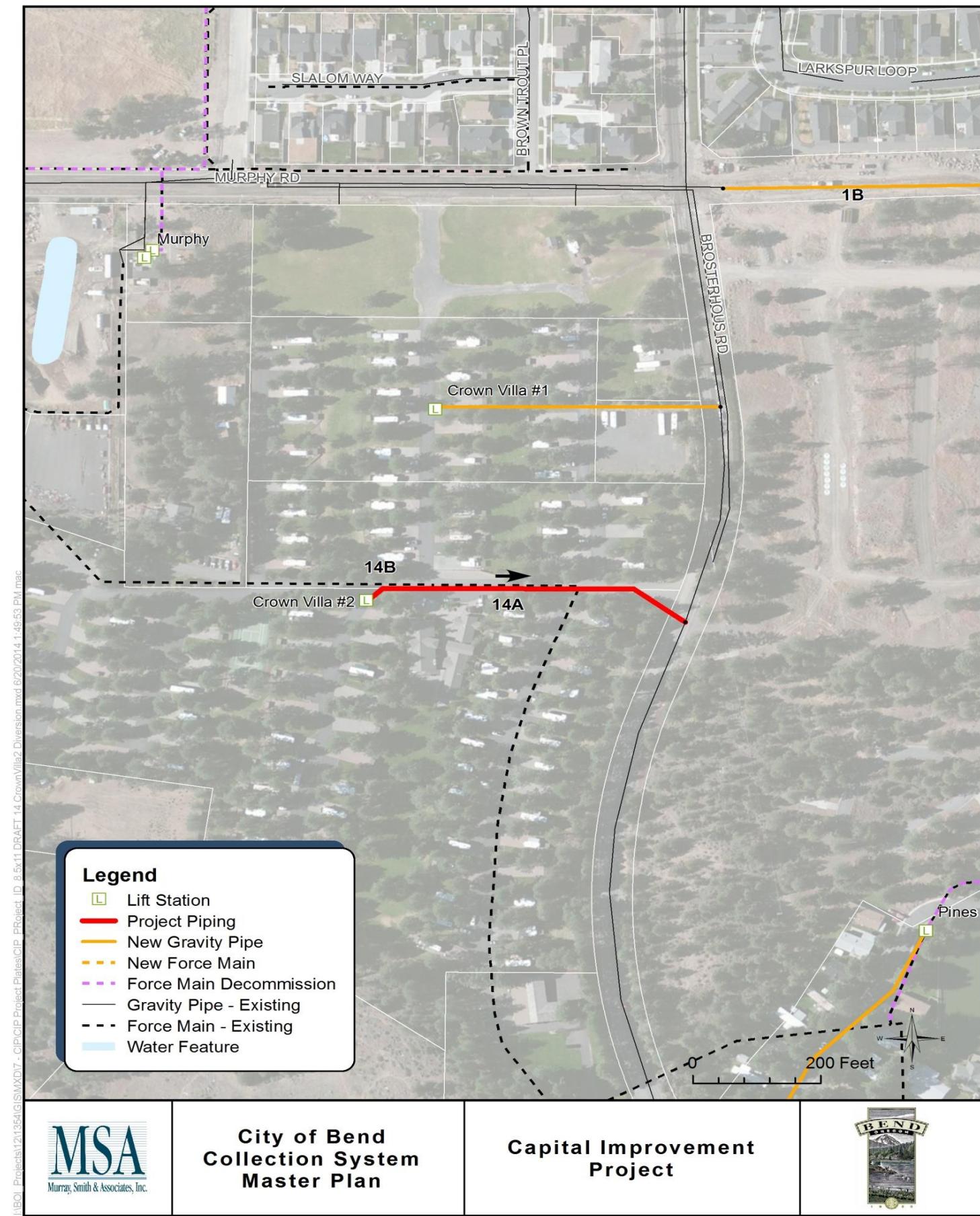
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 1. Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
14A	Trenched Gravity Sewer	600 LF	8-inch	Crown Villa #2 Lift Station	CMH009552
<b>Total Piping Estimate</b>					<b>\$122,000</b>
14B	Lift Station Decommission	1 EA	-	-	SEI MH
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$150,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project



Project ID: 15

Project Name: Murphy Lift Station Decommission

From: -

To: -

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: This improvement allows the contributing area of Murphy Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: The decommissioning of Murphy Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 1A, 2

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Gravity sewer to divert flow away from the Murphy Lift Station is already constructed. Cannot be constructed prior to SEI Phase 1.

Project ID	Type of Improvement	Unit	Diameter	From	To
15	Lift Station Decommission	1 EA	-	-	-

**Total Project Estimate** \$28,000

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 16A and 16B

Project Name: Quail Ridge #2 Decommission - Gravity Sewer Diversion

From: Quail Ridge #2 Lift Station

To: CMH009558

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: This improvement allows the contributing area of Quail Ridge #2 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch sewer line from Quail Ridge #2 Lift Station to Brosterhous Road (cross-country), connecting to existing gravity sewer northwest of Brosterhous Road and Windsor Drive intersection. The decommissioning of Quail Ridge #2 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 1A, 2

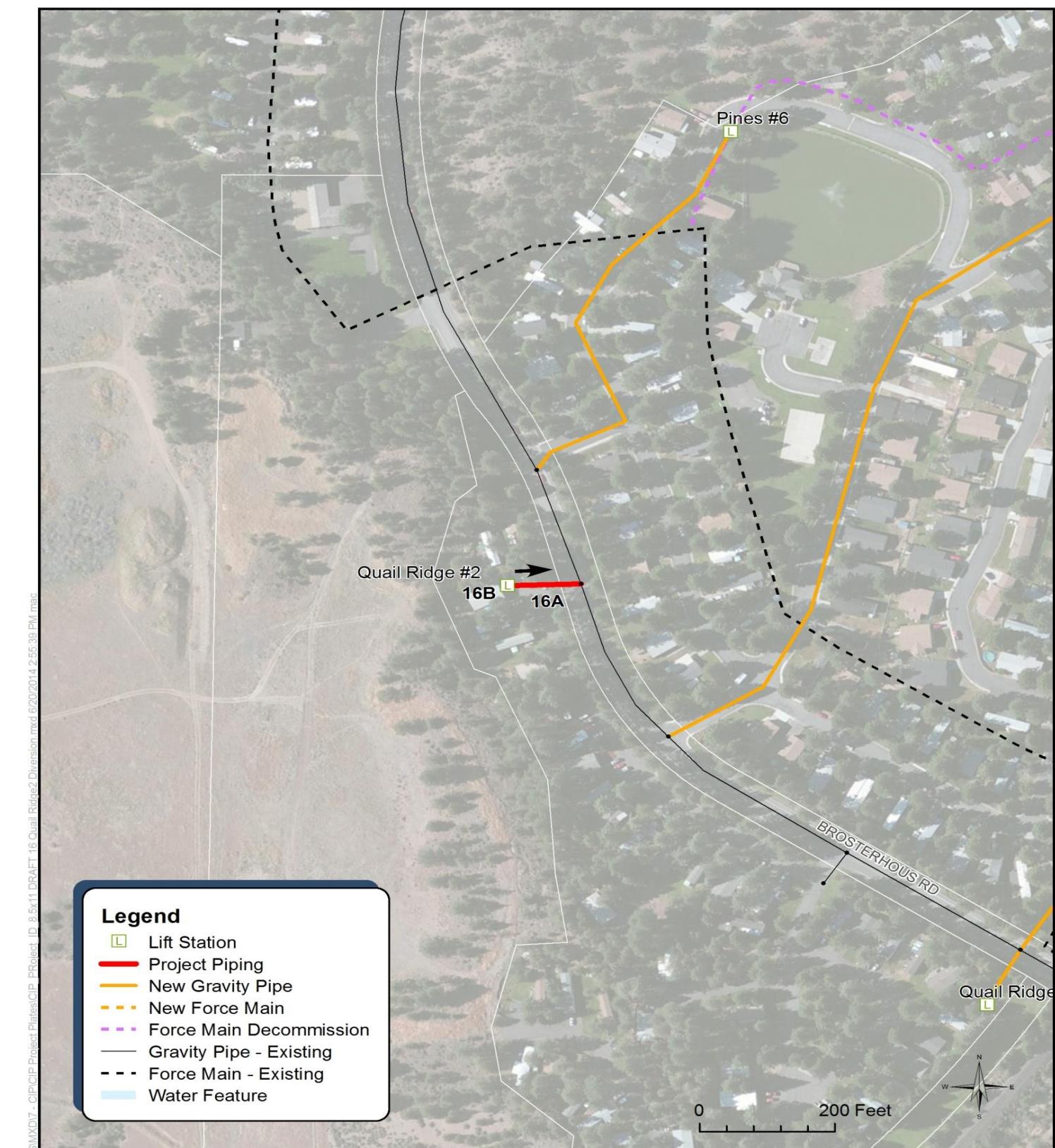
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 1. Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
16A	Trenched Gravity Sewer	100 LF	8-inch	Quail Ridge #2 Lift Station	CMH009558
<b>Total Piping Estimate</b>					<b>\$14,000</b>
16B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$42,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project



Project ID: 17A and 17B

Project Name: Ridgewater #1 Lift Station Decommission - Gravity Sewer Diversion

From: CMH004544

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: This improvement allows the contributing area of Ridgewater #2 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from CMH004544 to the new 24-inch SEI Phase 1 at the intersection of Ridgewater Loop and Ferguson Road.

The decommissioning of Ridgewater #1 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main and section of gravity main, which will be abandoned in place.

Required Preceding Projects: 1B, 1A, 2

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 1

Project ID	Type of Improvement	Unit	Diameter	From	To
17A	Trenched Gravity Sewer	100 LF	8-inch	CMH004544	SEI MH
<b>Total Piping Estimate</b>					<b>\$13,000</b>
17B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$41,000</b>

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 18A and 18B

Project Name: Shadow Glen Lift Station Decommission - Gravity Sewer Diversion

From: CMH007360

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: This improvement allows the contributing area of Shadow Glen Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from Shadow Glen Lift Station west, cross-country to 15th Street connecting to the new 24-inch SEI Phase 1 northeast of Golden Gate Place and 15th Street intersection. The decommissioning of Shadow Glen Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 1A, 2

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 1

Project ID	Type of Improvement	Unit	Diameter	From	To
18A	Trenched Gravity Sewer	100 LF	8-inch	CMH007360	SEI MH
<b>Total Piping Estimate</b>					<b>\$32,000</b>
18B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$60,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 19A and 19B

Project Name: South Village Lift Station Decommission - Gravity Sewer Diversion

From: CMH005962

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: This improvement allows the contributing area of South Village Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from South Village Lift Station to Murphy Road, connecting to new 18-inch SEI northwest of Murphy Road and Parrell Road intersection.

The decommissioning of South Village Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A, 60C

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2. Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
19A	Trenched Gravity Sewer	300 LF	8-inch	CMH005962	SEI MH
<b>Total Piping Estimate</b>					<b>\$64,000</b>
19B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$92,000</b>

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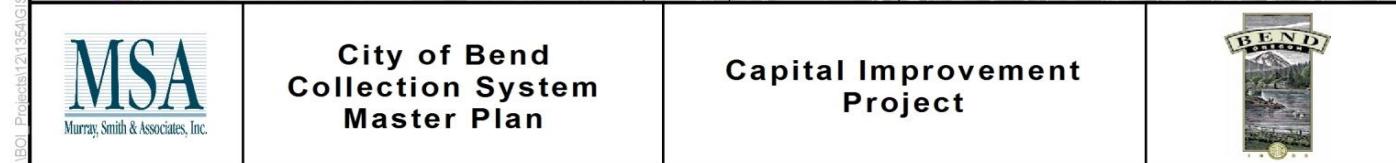
# **City of Bend Collection System Master Plan Capital Improvement Project**



Project ID: 20

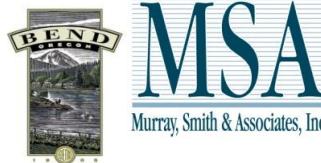
<b>Project Name:</b>	<b>Sun Meadow Lift Station Decommission</b>				
From:	-				
To:	-				
Project Category:	Hydraulic Capacity				
Implementation					
Timeframe:	4 to 5 year				
Objective:	This improvement allows the contributing area of Sun Meadow Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.				
Description:	The decommissioning of Sun Meadow Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.				
Required Preceding Projects:	1B, 1A, 2				
Required Concurrent Projects:	-				
Other Dependent Projects:	-				
Special Considerations:	The gravity sewer to divert flow from the lift station is already constructed but not used. Cannot be constructed prior to SEI Phase 1.				
<b>Project ID</b>	<b>Type of Improvement</b>	<b>Unit</b>	<b>Diameter</b>	<b>From</b>	<b>To</b>
20	Lift Station Decommission	1 EA	-	-	-
<b>Total Project Estimate</b>					<b>\$28,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 21

Project Name:	<b>Riverhouse Lift Station Hydraulic Upgrade</b>	
Location:	3075 North Highway 97	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	1 to 5 year	
Objective:	Downsize of mechanical pump components to match required capacity (peak wet-weather flow).	
Description:	Downsize of mechanical pumping and/or electrical components to decrease hydraulic capacity to closer to required capacity. Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: wet well, pumps, motors and electrical equipment. Some portion of this project will be funded by the hotel.	
Project ID	Type of Improvement	Required Buildout Capacity
21	Lift Station Improvement/Downsize	10 gpm
<b>Total Project Estimate</b>	<b>\$345,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 22A and 22B

Project Name: Parallel Sewer on Amethyst Street/Mahogany Street

From: CMH001646

To: CMH001653

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: Increase the hydraulic conveyance capacity of the local sewer system to accommodate existing and future flows.

Description: 22A: Parallel 8-inch line from Brookswood Boulevard and River Rim Drive intersection cross-country northeast to Amethyst Street, then east along Amethyst Street, connecting to the existing 10-inch line east of the Amethyst Street and Zircon Drive intersection. Project is initiated by dry weather peak flow trigger of 270 gpm at manhole CMH002318. See Project ID 9 for more information on Flow Monitoring Program. 22B: Parallel 10-inch line along Amethyst Street east of Zircon Drive to Garnet Street, then along Garnet Street to Mahogany Street, then along Mahogany Street to Chuckanut Drive, connecting to the existing 12-inch line at Mahogany Street and Chuckanut Drive intersection.

Required Preceding Projects: -

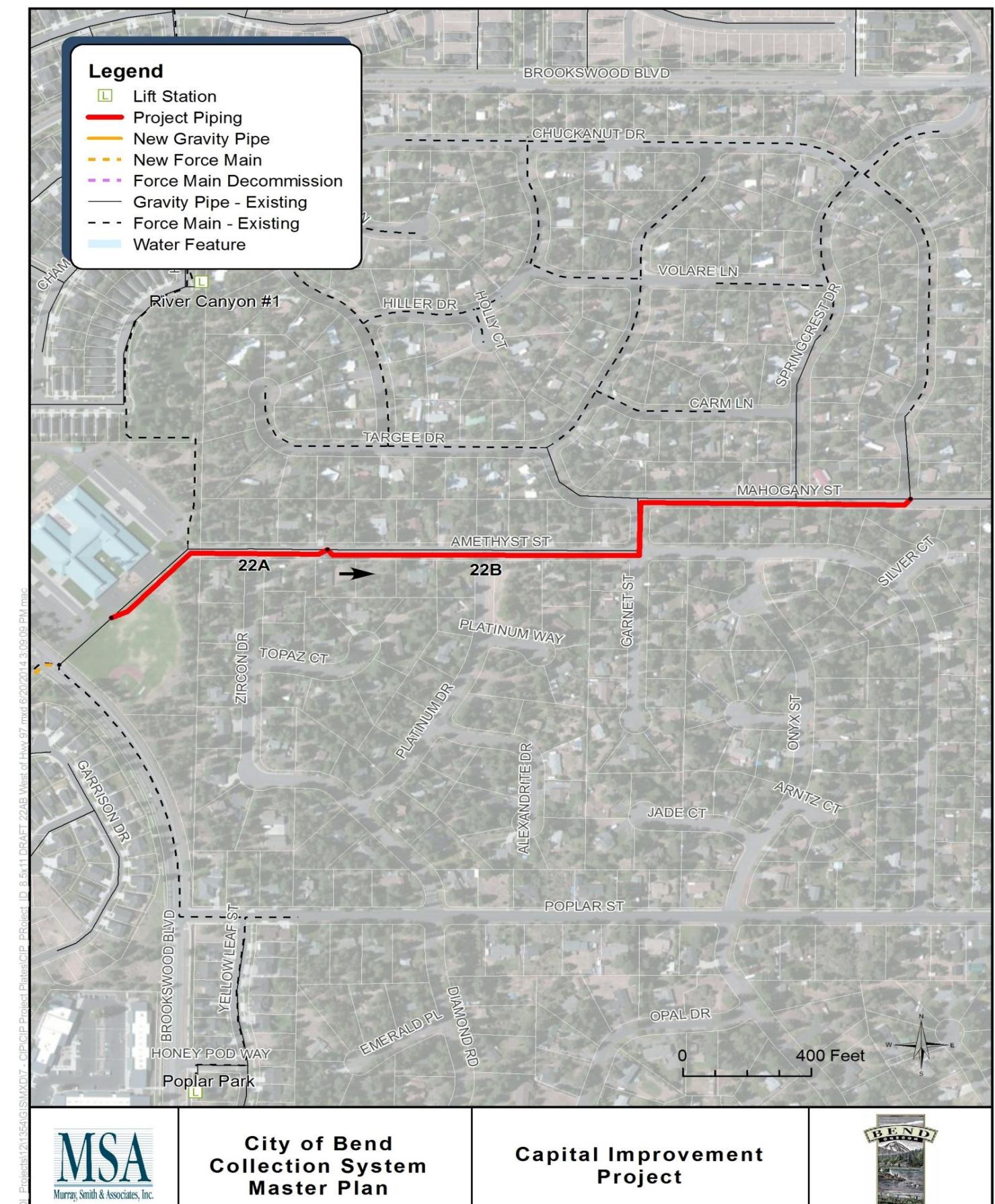
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
22A	Trenched Gravity Sewer	800 LF	8-inch	CMH001646	CMH001643
22B	Trenched Gravity Sewer	2,100 LF	10-inch	CMH001643	CMH001653
<b>Total Project Estimate</b>					<b>\$679,000</b>

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**City of Bend  
Collection System  
Master Plan**

**Capital Improvement  
Project**



June 2014

12-1354

# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 22C and 22D

Project Name: Parallel Sewer Mahogany Street to Highway 97

From: CMH001631

To: CMH001632

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: Increase the hydraulic conveyance capacity of the local sewer system to accommodate existing and future flows.

Description: 22C: Parallel 12-inch line along Granite Drive from Mahogany Street to Kings Lane, then along Kings Lane to Driftwood Lane, then along Driftwood Lane to Crystal Lane, then along Crystal Lane and cross-country, connecting to the existing 12-inch line northeast of the Crystal Lane and Driftwood Lane intersection.

Project is initiated by dry weather peak flow trigger of 320 gpm at manhole CMH002318. See Project ID 9 for more information on Flow Monitoring Program.

22D: Parallel 18-inch line from the Crystal Lane and Driftwood Lane intersection east, cross-country to west of Highway 97, connecting to the existing 12-inch line northwest of the Highway 97 and 3rd Street intersection.

Required Preceding Projects: -

Required Concurrent Projects: -

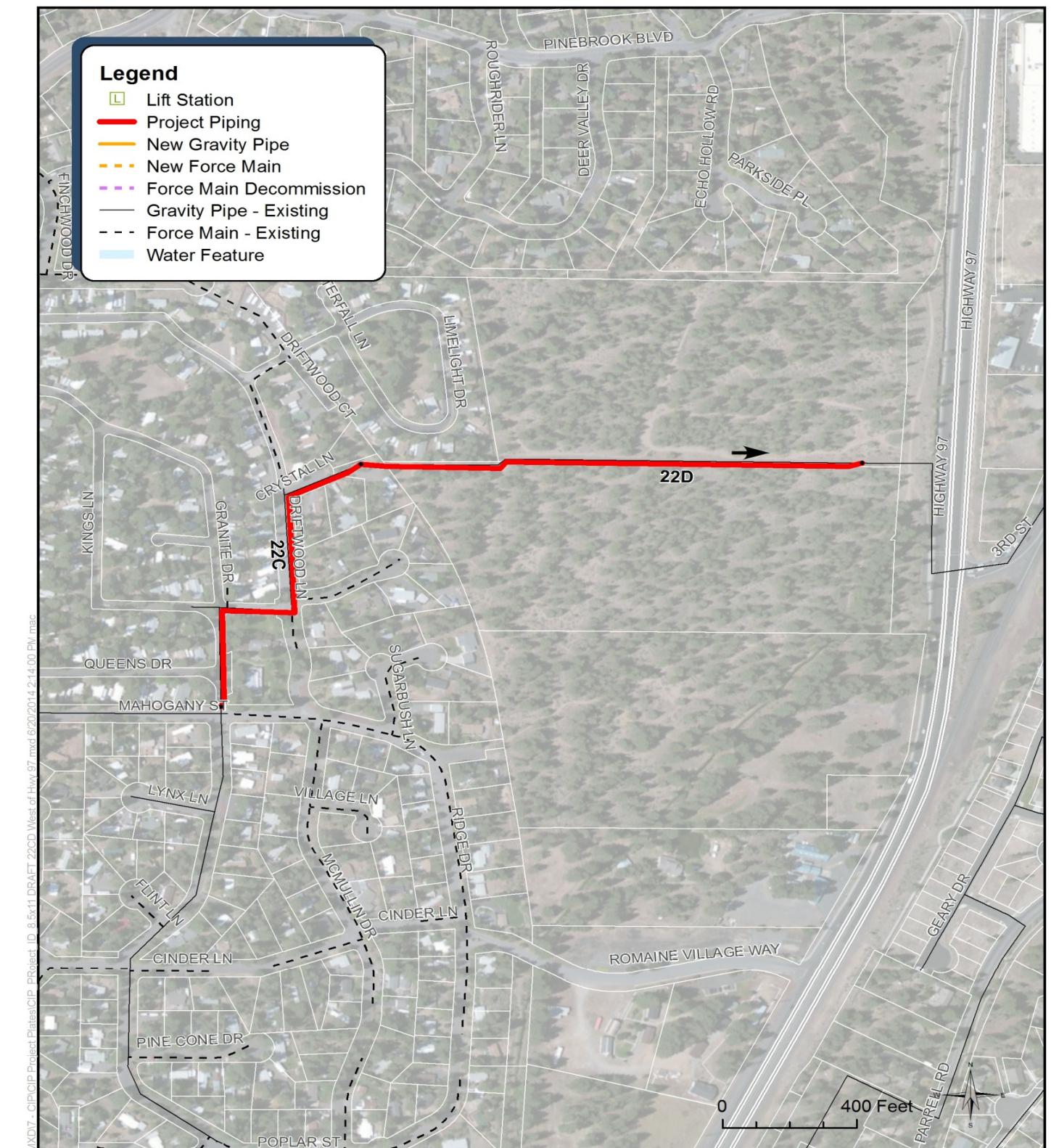
Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
22C	Trenched Gravity Sewer	1,200 LF	12-inch	CMH001631	CMH001637
22D	Trenched Gravity Sewer	1,600 LF	18-inch	CMH001637	CMH001632

**Total Project Estimate** \$999,000

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**City of Bend  
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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 22E

Project Name: Parallel Sewer on 3rd Street

From: CMH001629

To: CMH003638

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: Increase the hydraulic conveyance capacity of the local sewer system to accommodate existing and future flows.

Description: Parallel 18-inch line along 3rd Street between Highway 97 and Pinebrook Boulevard, connecting to the existing 18-inch line at 3rd Street and Pinebrook Boulevard.

Required Preceding Projects: -

Required Concurrent Projects: -

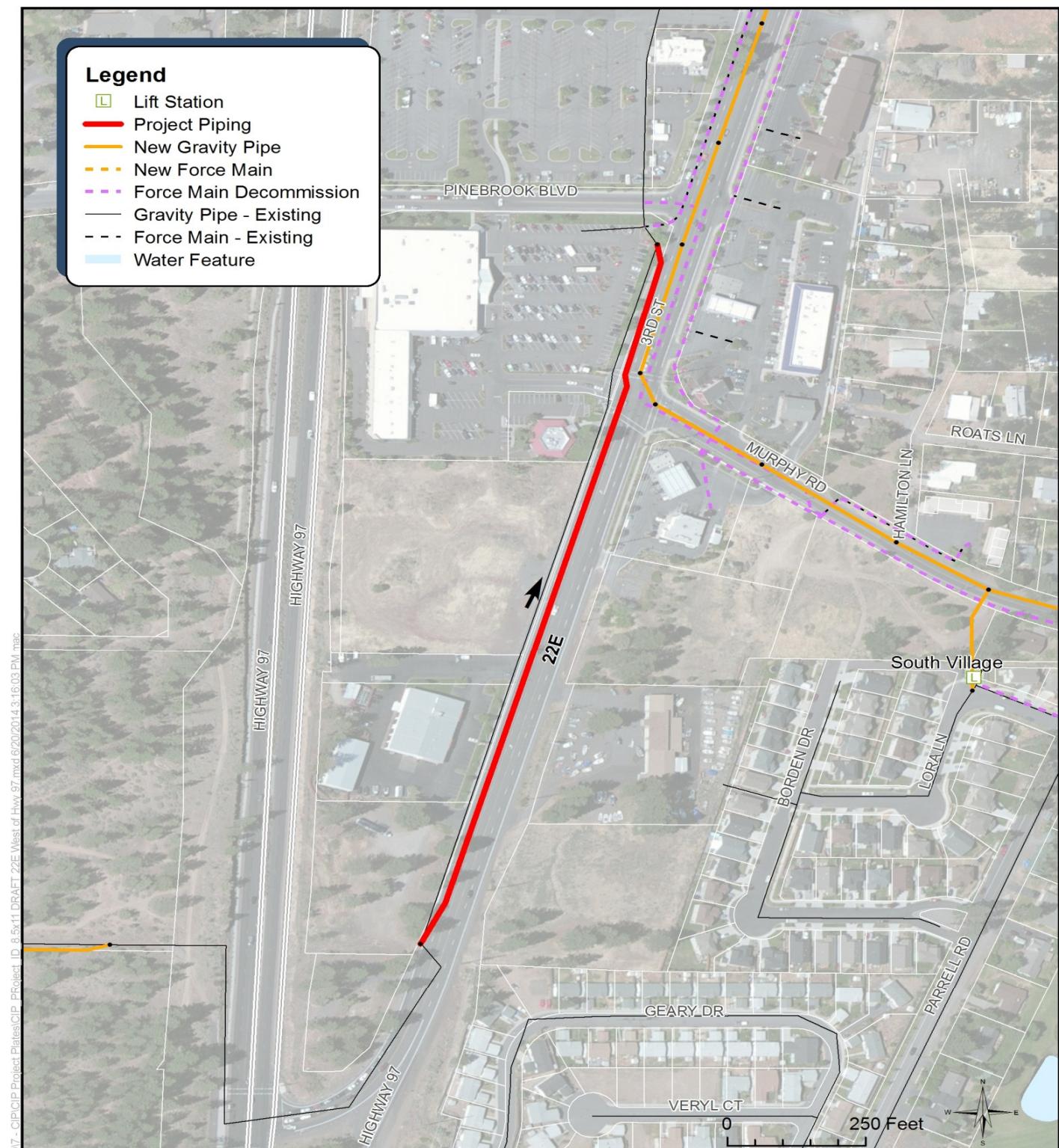
Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe. Project required in 1 to 5 year timeframe to address velocity criteria violations but has been deferred.

Project ID	Type of Improvement	Unit	Diameter	From	To
22E	Trenched Gravity Sewer	1,500 LF	18-inch	CMH001629	CMH003638

**Total Project Estimate** \$534,000

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**City of Bend  
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**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 23

Project Name: Parallel Sewer on Olney Avenue

Location: Along Olney Avenue from Wall Street to 1st Street

From: CMH003480

To: CMH008510

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: Increase the hydraulic conveyance capacity of the local sewer system to accommodate existing and future flows.

Description: Parallel 8-inch line along Olney Avenue between Wall Street and 1st Street, connecting to the existing 16-inch line at 1st Street and Olney Avenue intersection.

Required Preceding Projects: -

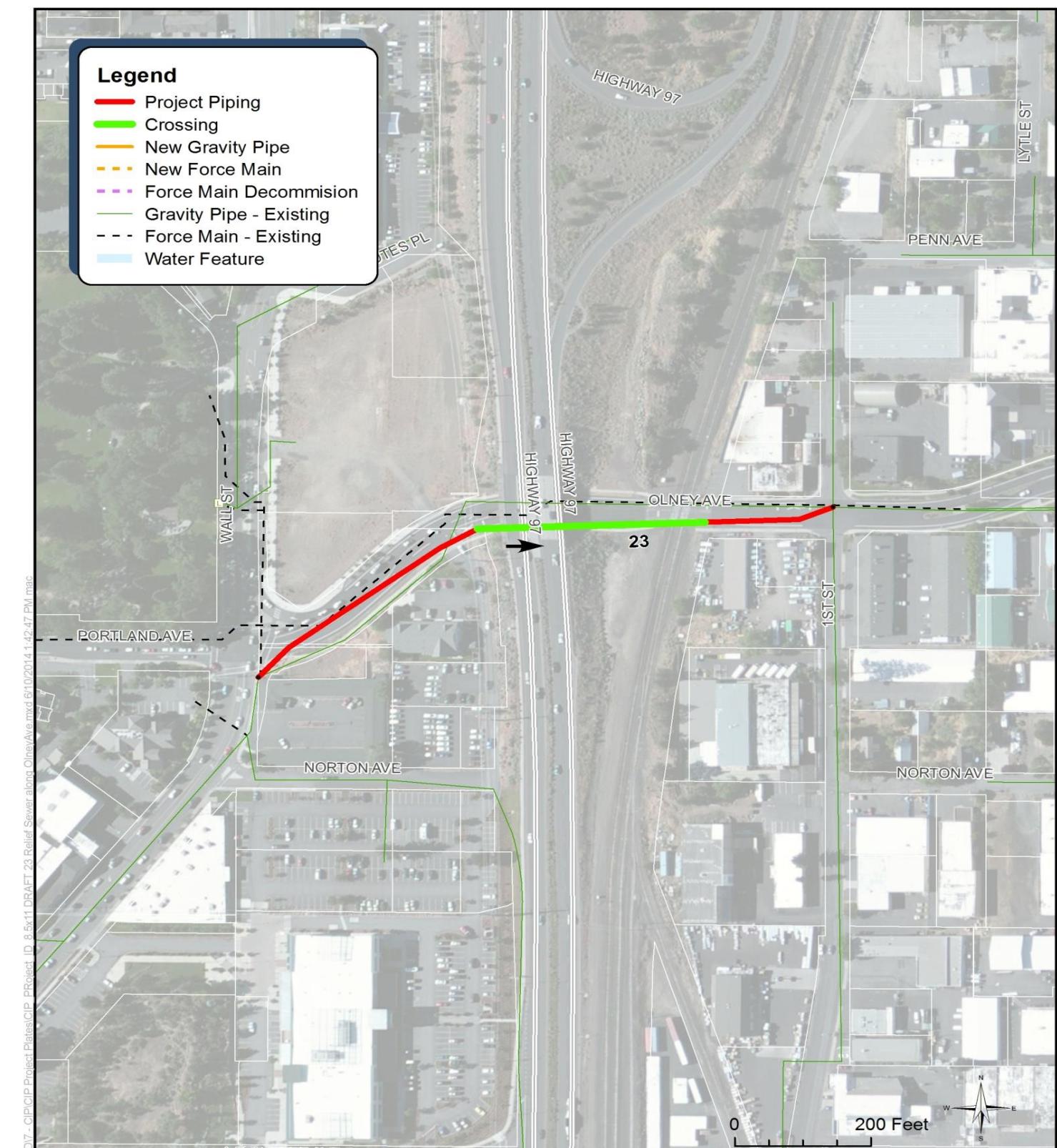
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Project includes highway and railroad crossing.  
The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
23	Trenched Gravity Sewer	700 LF	8-inch	CMH003480	CMH008510
23	Trenchless Crossing	300 LF	8-inch		
<b>Total Project Estimate</b>					<b>\$581,000</b>

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**City of Bend  
Collection System  
Master Plan**

**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 24

Project Name: Plant Interceptor Upgrade

From: CMH000207

To: CMH000205

Project Category: Hydraulic Capacity

Implementation

Timeframe: 4 to 5 year

Objective: Increase the hydraulic conveyance capacity of the Plant Interceptor to accommodate future flows.

Description: New 36-inch line to replace existing 30-inch east of Deschutes Market Road and south of Yeoman Road intersection.

Required Preceding Projects: -

Required Concurrent Projects: -

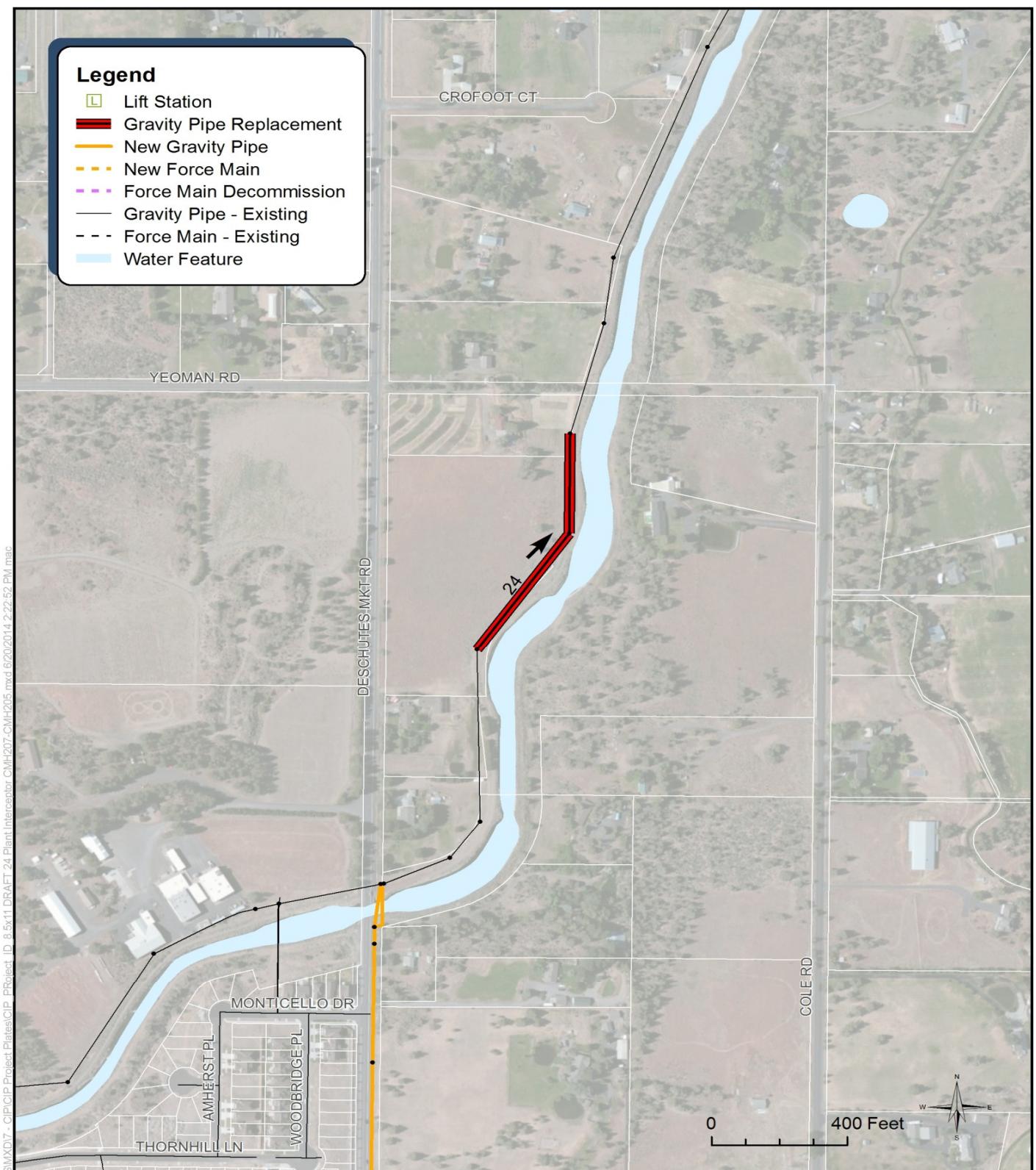
Other Dependent Projects: -

Special Considerations: Project requires bypass pumping during construction to transfer sewer around project.

Project ID	Type of Improvement	Unit	Diameter	From	To
24	Trenched Gravity Sewer Upgrade	400 LF	36-inch	CMH000207	CMH000206
24	Trenched Gravity Sewer Upgrade	500 LF	36-inch	CMH000206	CMH000205

**Total Project Estimate** \$542,000

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**City of Bend  
Collection System  
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**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

**Project ID:** 25

<b>Project Name:</b>	<b>Boyd Acres Lift Station Hydraulic Upgrade</b>	
Location:	63538 Stacy Lane	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	4 to 5 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.	
<b>Project ID</b>		
25	Type of Improvement	Required Buildout Capacity
	Lift Station Upgrade	190 gpm
<b>Total Project Estimate</b>	<b>\$345,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 26



Project Name:	Canal View Lift Station Hydraulic Upgrade
Location:	63383 Brightwater Drive
Project Category:	Hydraulic Capacity
Implementation	
Timeframe:	4 to 5 year
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.

Project ID	Type of Improvement	Required Buildout Capacity
26	Lift Station Upgrade	110 gpm

**Total Project Estimate** **\$150,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 27



<b>Project Name:</b>	<b>Pioneer Lift Station Condition Upgrade</b>
Location:	1525 Wall Street
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, access to lift station. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 28



Project Name:	River Canyon #2 Lift Station Hydraulic Upgrade
Location:	19712 Hollygrape Street
Project Category:	Hydraulic Capacity
Implementation	
Timeframe:	4 to 5 year
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.

Project ID	Type of Improvement	Required Buildout Capacity
28	Lift Station Upgrade	180 gpm
<b>Total Project Estimate</b>		<b>\$345,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 29



<b>Project Name:</b>	<b>River Rim Lift Station Hydraulic Replacement</b>	
Location:	19420 Charleswood Lane	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	4 to 5 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Replacement of existing facility with a new lift station to accommodate upgrades in capacity. Project includes new pumps, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	
<b>Project ID</b>	<b>Type of Improvement</b>	<b>Required Buildout Capacity</b>
29	Lift Station Replacement	550 gpm
<b>Total Project Estimate</b>		<b>\$1,558,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 31



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Awbrey Glen Lift Station Condition Upgrade</b>
Location:	2260 NW Putnam Road
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Lift Station needs a backup generator because it is difficult and time consuming for O&M Department to access the lift station which increases length of time that facility will not pump during power outage and risk of sewer overflow. Project includes generator and electrical upgrades. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$139,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 32

Project Name:	Camden Park Lift Station Condition Upgrade
Location:	61135 Ferguson Road
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, rail system and electrical panel. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$150,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 33



Project Name:	Crown Villa #1 Lift Station Condition Upgrade
Location:	550 feet southwest of Murphy Road and Brosterhous Road intersection
Project Category:	Improve Condition
Implementation:	
Timeframe:	Year 1
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Lift Station requires immediate improvement prior to decommissioning in years 4 to 5. Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 34



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Crown Villa #2 Lift Station Condition Upgrade</b>
Location:	900 feet southwest of Murphy Road and Brosterhous Road intersection
Project Category:	Improve Condition
Implementation	
Timeframe:	Year 1
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Lift Station requires immediate improvement prior to decommissioning in years 4 to 5. Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel and control panel.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 35



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Deschutes Business Lift Station Condition Upgrade</b>
Location:	63171 Jamison Street
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Replacement of lift station and components where O&M Department condition assessment indicated poor condition: pumps, discharge piping, corroded wet well, corroded discharge piping and corroded valve pit. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 36



<b>Project Name:</b>	<b>Drake Lift Station Condition Upgrade</b>
Location:	100 NW Congress Street
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Replacement of lift station in order to maintain the operational design conditions and avoid further deterioration.
Description:	Replacement of existing facility with a new lift station to address condition issues and site constraints. Project includes pumps, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment. City O&M Staff to determine specific timing of improvement.

**Total Project Estimate** **\$1,853,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 37



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Empire Lift Station Condition Upgrade</b>
Location:	63080 Corporate Place
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and variable frequency drives. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 38



Project Name:	Empire Village Lift Station Condition Upgrade
Location:	63177 Eastview Drive
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and investigation into air locking. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 39



Project Name:	Nottingham #1 Lift Station Condition Upgrade
Location:	420 feet west of King Richard Court and Robin Hood Lane intersection
Project Category:	Improve Condition
Implementation:	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: corroded pumps, piping and rail system. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$150,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 40



<b>Project Name:</b>	<b>Nottingham #2 Lift Station Condition Upgrade</b>
Location:	145 feet southwest of Blacksmith Circle and Sherwood Forest Drive intersection
Project Category:	Improve Condition
Implementation:	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: wet well and discharge piping. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$150,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 41

Project Name:	<b>Pacific Lift Station Condition Upgrade</b>
Location:	210 NW Pacific Park Lane
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: access to lift station pumps and piping. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 42



Project Name:	<b>Poplar Park Lift Station Condition Upgrade</b>
Location:	60841 Yellow Leaf Street
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 43



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Quail Ridge #1 Lift Station Condition Upgrade</b>
Location:	500 feet northwest of Brosterhous Road and Windsor Drive intersection
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$150,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 44



<b>Project Name:</b>	<b>Quail Ridge #2 Lift Station Condition Upgrade</b>
Location:	1,500 feet northwest of the Brosterhous Road and Windsor Drive intersection.
Project Category:	Improve Condition
Implementation	
Timeframe:	Year 1
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Lift Station requires immediate improvement prior to decommissioning in years 4 to 5. Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel.
<b>Total Project Estimate</b>	<b>\$150,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 45



Project Name:	<b>Renwick Lift Station Condition Upgrade</b>
Location:	1702 SE Karena Court
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: vacuum priming system and small wet well. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 46



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Rimrock #1 Lift Station Condition Upgrade</b>
Location:	636 NW Silver Buckle
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*

# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 47



<b>Project Name:</b>	<b>Rimrock #2 Lift Station Condition Upgrade</b>
Location:	620 NW Silver Buckle
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 48



Project Name:	Rimrock #4 Lift Station Condition Upgrade
Location:	700 NW Silver Buckle
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*

# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 49

Project Name:	Rimrock #5 Lift Station Condition Upgrade
Location:	721 NW Silver Buckle
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*

# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 50

Project Name:	<b>The Pines #5 Lift Station Condition Upgrade</b>
Location:	1,550 feet southwest of Murphy Road and Brosterhous Road intersection.
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: station piping and plumbing. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 51



<b>Project Name:</b>	<b>The Pines #6 Lift Station Condition Upgrade</b>
Location:	1,350 feet southwest of Murphy Road and Brosterhous Road intersection.
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: station piping and plumbing. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project



Project ID: 52

Project Name: **The Pines #7 Lift Station Condition Upgrade**

Location: 750 feet north of Brosterhous and Windsor Drive intersection.

Project Category: Improve Condition

Implementation

Timeframe: 1 to 5 year

Objective: Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.

Description: Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: station piping and plumbing.  
City O&M Staff to determine specific timing of improvement.

<b>Total Project Estimate</b>	<b>\$100,000</b>
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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 53



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Underwood Lift Station Condition Upgrade</b>
Location:	224 NE Underwood Avenue
Project Category:	Improve Condition
Implementation	
Timeframe:	1 to 5 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: vacuum priming system and small wet well. City O&M Staff to determine specific timing of improvement.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project



Project ID: 54

Project Name:	<b>Odor Control Master Plan</b>
Location:	NA
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	Year 5
Objective:	To formulate a plan of action to address odor control issues for existing and future conditions
Description:	Collection System Odor Master Plan will include study, documentation and evaluation of the collection system odors issues as well as recommend improvements and prepare a capital improvement plan.
<b>Total Project Estimate</b>	<b>\$1,000,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 57

Project Name: Plant Interceptor Sewer Storage - Land Acquisition

Location: Deschutes Market Road

Project Category: Miscellaneous Project

Implementation

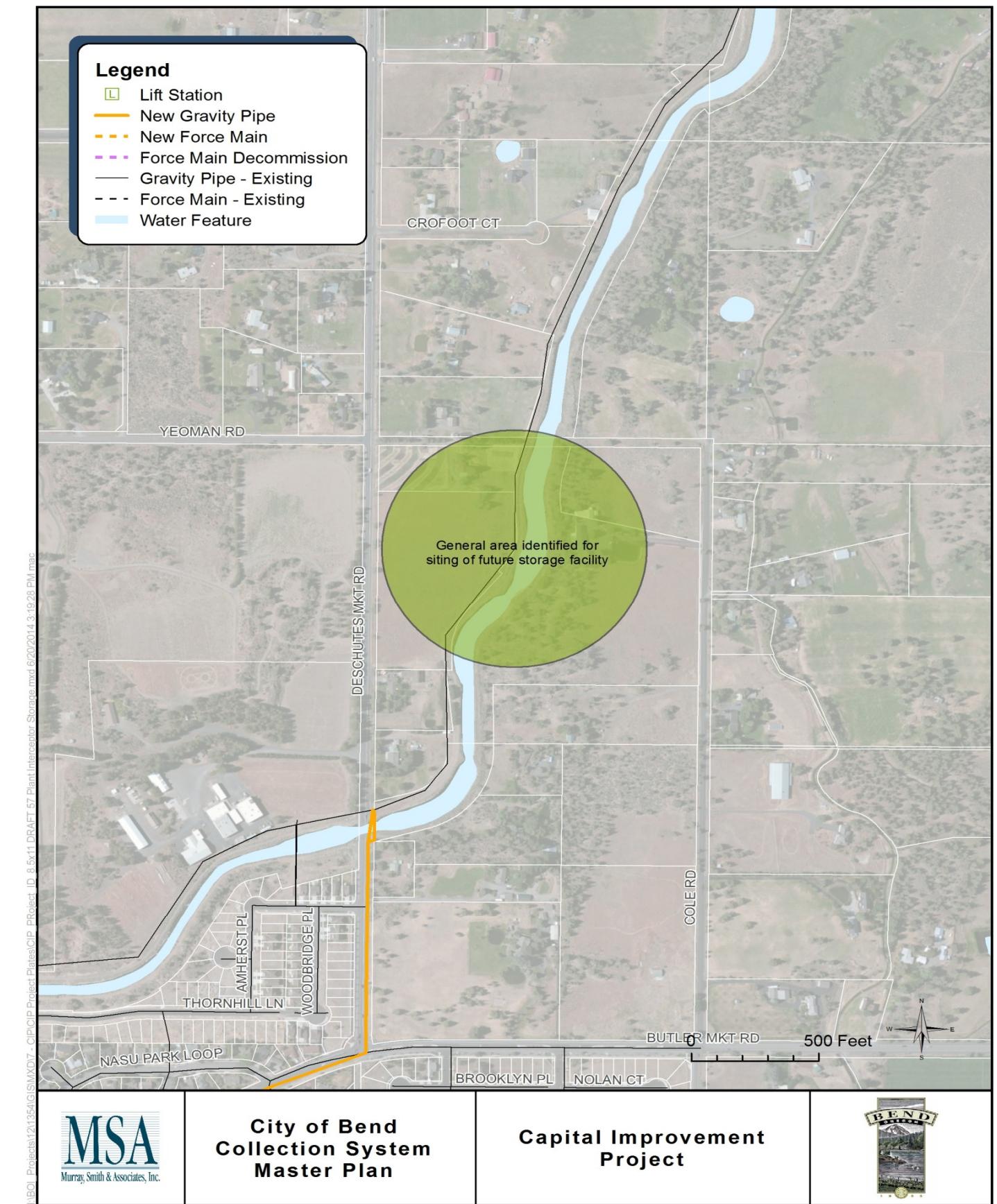
Timeframe: Year 4

Objective: Purchase land for future wet weather storage facility.

Description: This project is for land acquisition that would be used in the future for offline underground storage of wet weather sewage flow. This project does not include design or construction of the storage facility. The future storage will connect to the Plant Interceptor to remove flow from the interceptor and pump the stored sewage back to the interceptor after the storm event has passed. The wet weather flow would cause deficiencies downstream of the storage facility if not captured. The future below ground storage tank will be approximately 1.0 million gallons.

**Total Project Estimate** **\$143,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 58

Project Name: Amethyst Street Sewer Storage - Land Acquisition

Location: Amethyst Street and Platinum Drive

Project Category: Miscellaneous Project

Implementation

Timeframe: Year 4

Objective: Purchase land for future wet weather storage facility.

Description: This project is for land acquisition that would be used in the future for offline underground storage of wet weather sewage flow. This project does not include design or construction of the storage facility. The future storage will connect to the gravity sewer in Amethyst Street (manhole CMH001642) to remove flow from the interceptor and pump the stored sewage back to the interceptor after the storm event has passed. The wet weather flow would cause deficiencies downstream of the storage facility if not captured. The future below ground storage tank will be approximately 0.1 million gallons.

**Total Project Estimate** \$68,000

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HBG Project ID: 121354 GISINX017\_CPCIP Project Plans/CIP Project ID: 85011 DRAFT 59 Amethyst Street Storage

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 59

Project Name: Central Sewer Storage - Land Acquisition

Location: Studio Road and Webster Avenue

Project Category: Miscellaneous Project

Implementation

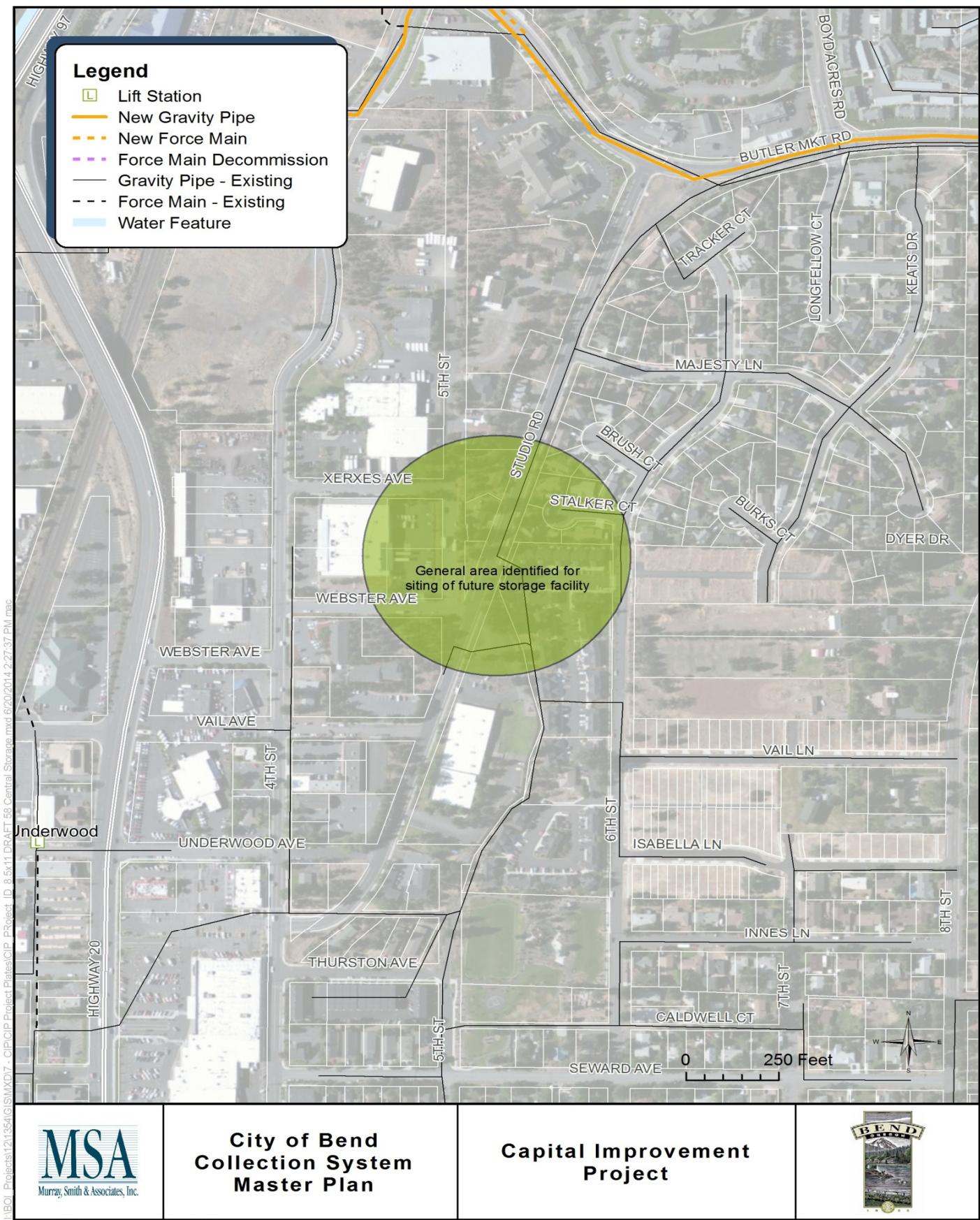
Timeframe: Year 4

Objective: Purchase land for future wet weather storage facility.

Description: This project is for land acquisition that would be used in the future for offline underground storage of wet weather sewage flow. This project does not include design or construction of the storage facility. The future storage will connect to the gravity sewer in Studio Road (manhole CMH000543) to remove flow from the interceptor and pump the stored sewage back to the interceptor after the storm event has passed. The wet weather flow would cause deficiencies downstream of the storage facility if not captured. The future below ground storage tank will be approximately 0.25 million gallons.

**Total Project Estimate** \$489,000

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# City of Bend Collection System Master Plan Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

Project ID: **60A**

Project Name: **SEI Phase 2 - North**

From: SEI MH

To: CMH000247

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: This improvement provides additional conveyance capacity, allowing for flow to be diverted away from hydraulically deficient infrastructure in the existing southeast and central portions of the collection system. It enables city-owned lift stations to be decommissioned and also allows for service to currently unsewered properties within the UGB.

Description: New 30-inch line along 27th Street between Mary Rose Place and Butler Market Road, then along Butler Market Road to Deschutes Market Road, then along Deschutes Market Road, connecting to existing 36-inch line north of Deschutes Market Road and Monticello Drive intersection.

Project is initiated by dry weather peak flow trigger of 920 gpm at manhole CMH002318. See Project ID 9 for more information on Flow Monitoring Program.

Required Preceding

Projects: **1B**

Required Concurrent

Projects: **60B, 60C**

Other Dependent Projects: 61A and 61B, 65A and 65B, 66A and 66B, 62A and 62B, 67A and 67B, 63A and 63B, 64A and 64B, 60B, 97A and 97B, 92A and 92B, 88A and 88B, 96A and 96B, 90A and 90B, 95A and 95B, 94A and 94B, 91A and 91B, 89A and 89B, 93A and 93B, 87

Special Considerations: Canal crossing (COID Canal).

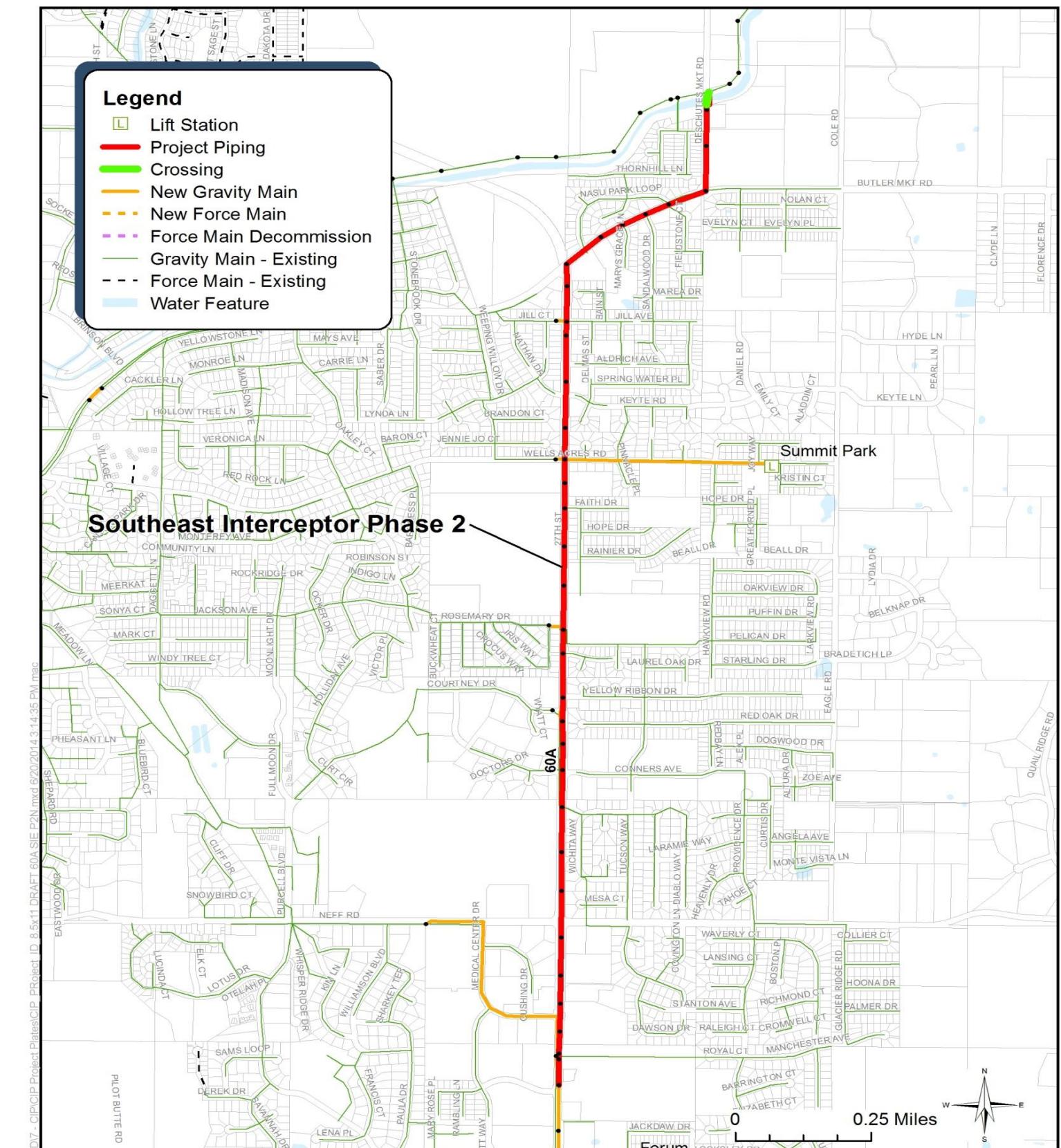
Project includes disconnecting temporary connection to existing gravity sewer constructed as part of SEI Phase 1.

This project has been designed by a City consultant.

Project ID	Type of Improvement	Unit	Diameter	From	To
60A	Trenched Gravity Sewer	11,500 LF	30-inch	SEI MH	CMH000247
60A	Trenchless Canal Crossing	200 LF	30-inch		

**Total Project Estimate** **\$8,287,000**

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



**MSA**  
Murray, Smith & Associates, Inc.

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Collection System  
Master Plan**

**Capital Improvement  
Project**



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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 60B

### Project Name: SEI - Connections to Existing System

From: Existing Manhole

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: Connection of existing service areas to the SEI Phase 2.

Description: Project consists of 4 Segments connecting to the SEI Phase 2: first segment is a new 8-inch gravity line along 27th Street at intersection of Courtney Drive and 27th Street, connecting to the new 30-inch SEI line. The second segment is a new 8-inch gravity line going southeast, cross-country from Rosemary Drive to 27th Street, connecting to the new 30-inch SEI line north of the intersection. The third segment is a new 8-inch gravity line along Rosemary Drive connection to the new 30-inch SEI. The fourth segment is a new 8-inch gravity line along Jill Court at the intersection of Jill Court and 27th Street, connecting to the new 30-inch SEI line.

Required Preceding

Projects: 1B

Required Concurrent

Projects: 60A, 60C

Other Dependent Projects: -

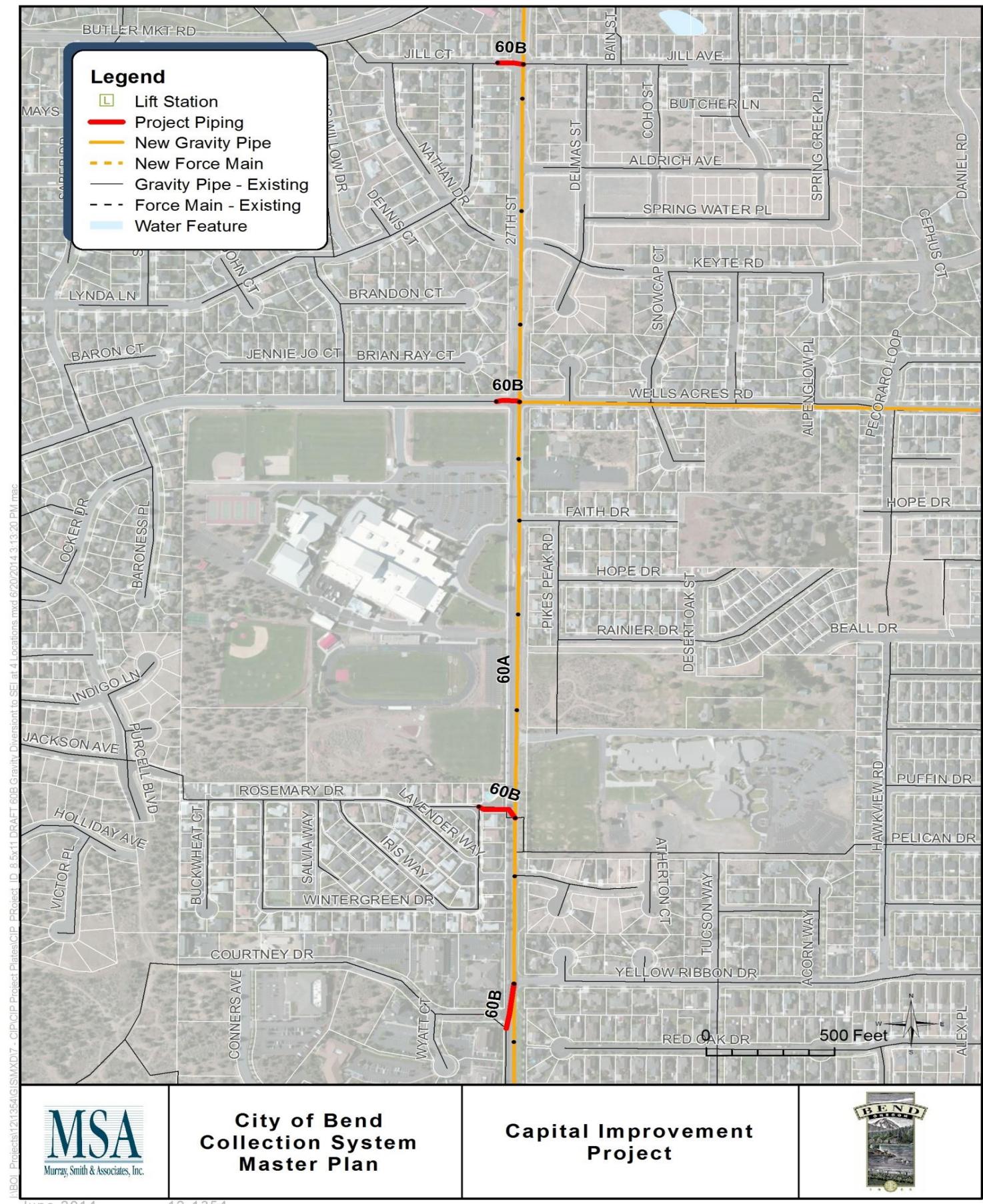
Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
60B	Trenched Gravity Sewer	100 LF	8-inch	CMH003545	SEI MH
60B	Trenched Gravity Sewer	100 LF	8-inch	CMH007940	SEI MH
60B	Trenched Gravity Sewer	100 LF	8-inch	CMH003013	SEI MH
60B	Trenched Gravity Sewer	100 LF	8-inch	CMH004337	SEI MH

### Total Project Estimate

\$92,000

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# City of Bend Collection System Master Plan Capital Improvement Project



Project ID: 60C

Project Name: SEI Phase 2 - South

From: CMH002954

To: CMH009581

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: This improvement provides additional conveyance capacity, allowing for flow to be diverted away from hydraulically deficient infrastructure in the existing southeast and central portions of the collection system. It enables city-owned lift stations to be decommissioned and also allows for service to currently unsewered properties within the UGB.

Description: New 18-inch line along Badger Road between Highway 97 and 3rd Street, then along 3rd Street to Murphy Road, then along Murphy Road to Parrell Road, connecting to the existing 18-inch line at Murphy Road and Parrell Road intersection.

Project is initiated by dry weather peak flow trigger of 870 gpm at manhole CMH003221. See Project ID 9 for more information on Flow Monitoring Program.

Required Preceding

Projects: 1B

Required Concurrent

Projects: 60A, 60B

Other Dependent Projects: -

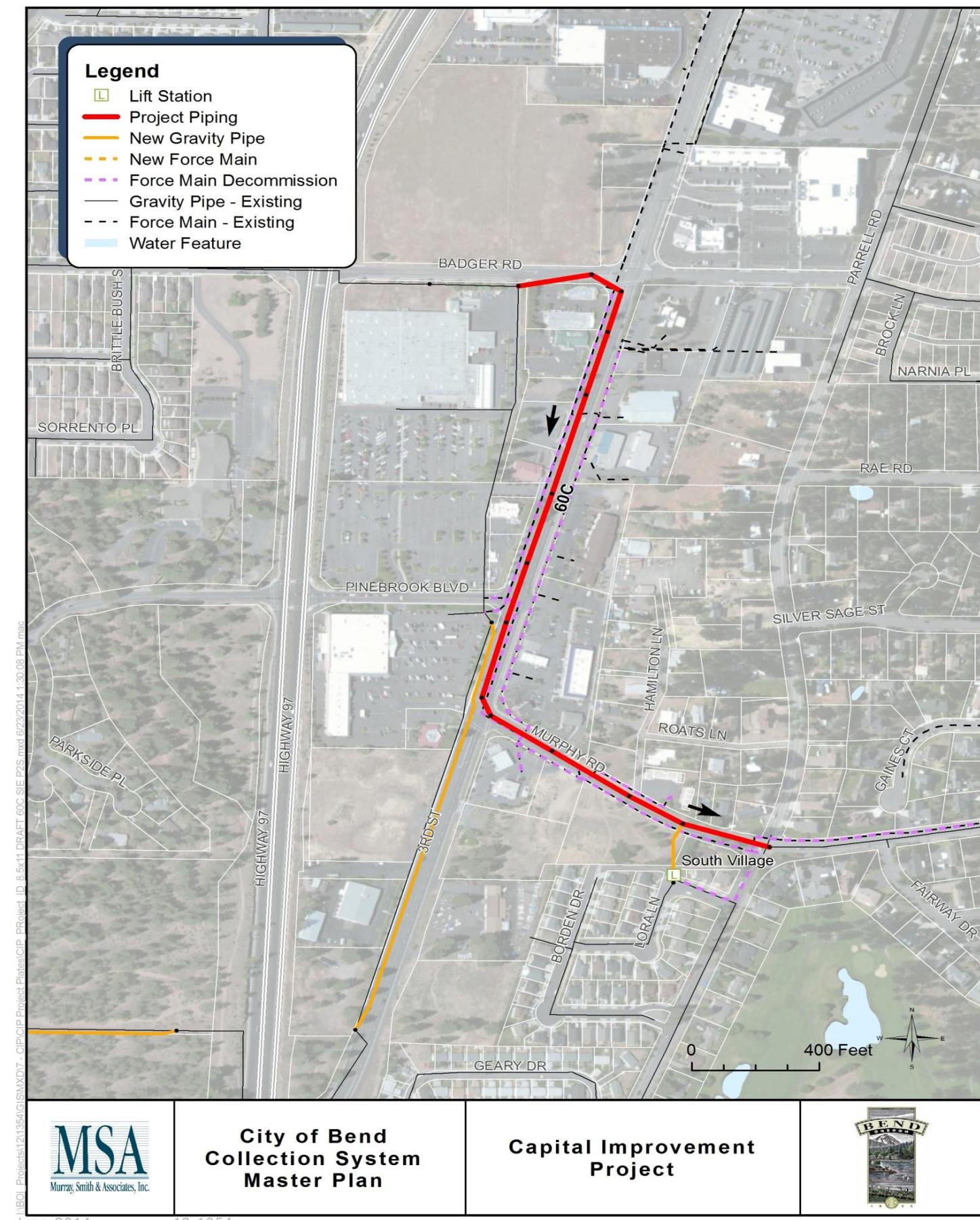
Special Considerations: This project has been designed by a City consultant.

The connection at CMH002954 could be designed as a diversion manhole: able to divert to SEI or existing collection system. The connection was planned in the CSMP to be a complete diversion to the SEI. However, a modifiable diversion will provide flexibility and operator control based on downstream conditions as flows develop in the system and improvements are made.

Project ID	Type of Improvement	Unit	Diameter	From	To
60C	Trenched Gravity Sewer	2,900 LF	18-inch	CMH002954	CMH009581

**Total Project Estimate** \$2,039,000

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 61A and 61B

Project Name: New Sewer Line along Brosterhous Road

From: Interim Stone Creek Lift Station

To: CMH009547

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: This improvement allows the contributing area of Interim Stone Creek Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from Interim Stone Creek Lift Station, going east cross-country approximately 400 feet, then cross-country going south to Brosterhous Road, then along Brosterhous Road to Jacklight Lane, connecting to existing 10-inch line.

Project is initiated by dry weather peak flow trigger of 190 gpm at manhole CMH009219. See Project ID 9 for more information on Flow Monitoring Program.

The decommissioning of Interim Stone Creek Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
61A	Trenched Gravity Sewer	2,400 LF	8-inch	Interim Stone Creek Lift Station	CMH009547
<b>Total Piping Estimate</b>					<b>\$883,000</b>
61B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$911,000</b>

The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 62A and 62B

Project Name:	Camden Park Lift Station Decommission - Gravity Sewer Diversion				
From:	Camden Park Lift Station				
To:	Project ID 67				
Project Category:	Hydraulic Capacity				
Implementation					
Timeframe:	6 to 10 year				
Objective:	<p>This improvement allows the contributing area of Camden Park Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.</p>				
Description:	<p>New 8-inch gravity line from Camden Park Lift Station along Ferguson Road, connecting to new 8-inch gravity line (Project 67A) east of Ferguson Road and Sage Creek Drive intersection.</p> <p>The decommissioning of Camden Park Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.</p>				
Required Preceding Projects:	1B, 60A, 67A				
Required Concurrent Projects:	-				
Other Dependent Projects:	-				
Special Considerations:	Cannot be constructed prior to SEI Phase 2.				
<b>Project ID</b>	<b>Type of Improvement</b>	<b>Unit</b>	<b>Diameter</b>	<b>From</b>	<b>To</b>
62A	Trenched Gravity Sewer	1,100 LF	8-inch	Camden Park Lift Station	Project ID 67
<b>Total Piping Estimate</b>					
					<b>\$1,122,000</b>
62B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					
					<b>\$28,000</b>
<b>Total Project Estimate</b>					
					<b>\$1,150,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 63A and 63B

**Project Name:** Desert Skies Lift Station Decommission - Gravity Sewer Diversion

From: CMH005687

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: This improvement allows the contributing area of Desert Skies Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from Desert Skies Lift Station along Daily Estates Drive to Clairaway Avenue, then along Clairaway Avenue to 27th Street, connecting to the new 30-inch SEI line. The decommissioning of Desert Skies Lift Station process includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
63A	Trenched Gravity Sewer	900 LF	8-inch	CMH005687	SEI MH
<b>Total Piping Estimate</b>					<b>\$784,000</b>
63B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$812,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: **64A and 64B**

<b>Project Name:</b>	<b>Forum Lift Station Decommission - Gravity Sewer Diversion</b>				
From:	CMH006682				
To:	SEI MH				
Project Category:	Hydraulic Capacity				
Implementation					
Timeframe:	6 to 10 year				
Objective:	This improvement allows the contributing area of Forum Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.				
Description:	New 8-inch gravity line from Forum Lift Station along Forum Drive connecting to new 30-inch SEI line at Forum Drive and 27th Street intersection. The decommissioning of Forum Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.				
Required Preceding Projects:	1B, 60A				
Required Concurrent Projects:	-				
Other Dependent Projects:	-				
Special Considerations:	Cannot be constructed prior to SEI Phase 2.				
<b>Project ID</b>					
64A	Type of Improvement	Unit	Diameter	From	To
64A	Trenched Gravity Sewer	800 LF	8-inch	CMH006682	SEI MH
<b>Total Piping Estimate</b>		<b>\$287,000</b>			
64B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>		<b>\$28,000</b>			
<b>Total Project Estimate</b>		<b>\$315,000</b>			

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# City of Bend Collection System Master Plan

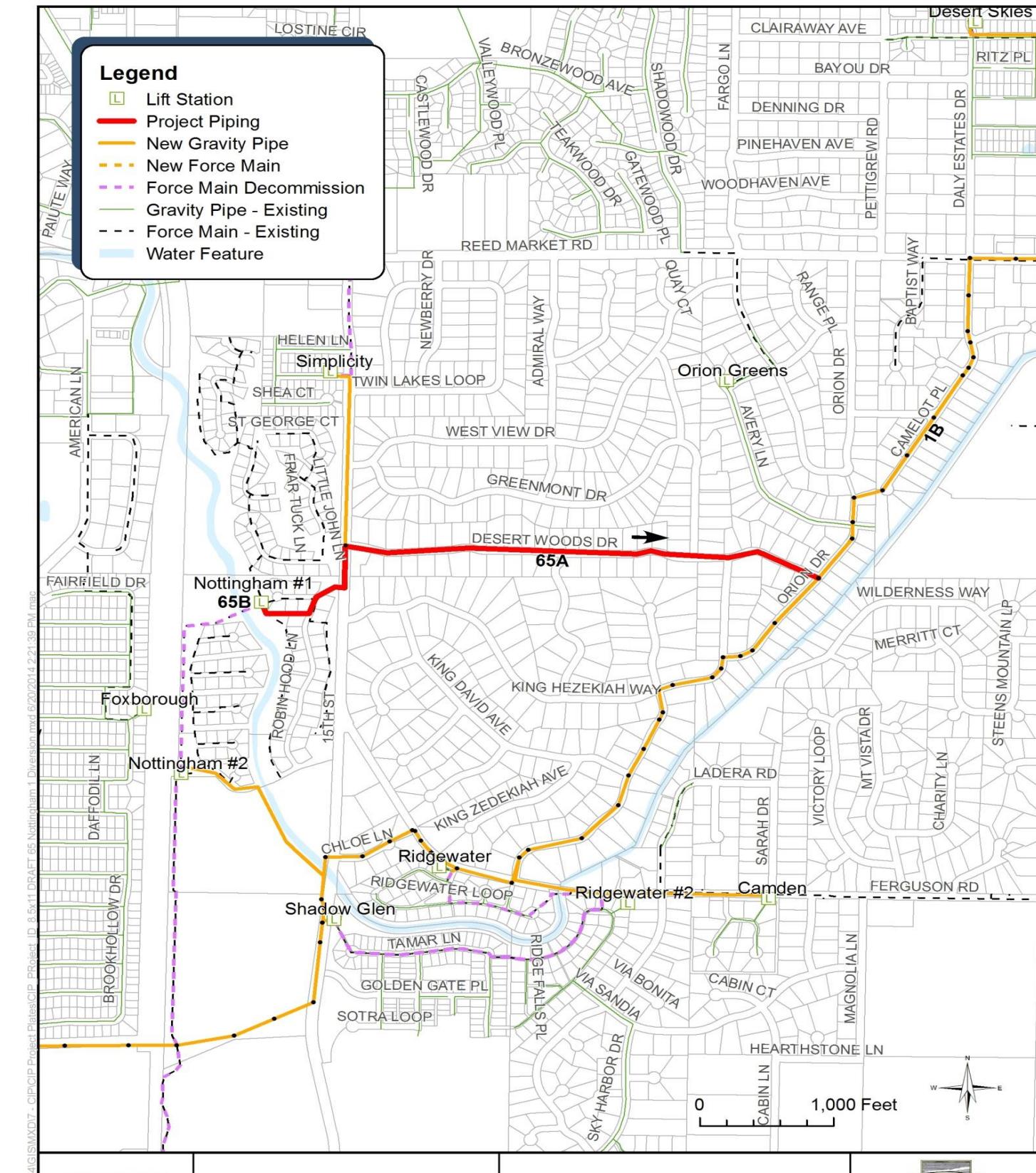
## Capital Improvement Project



Project ID: 65A and 65B

Project Name:	Nottingham #1 Lift Station Decommission - Gravity Sewer Diversion				
From:	Nottingham #1 Lift Station				
To:	SEI MH				
Project Category:	Hydraulic Capacity				
Implementation:					
Timeframe:	6 to 10 year				
Objective:	This improvement allows the contributing area of Nottingham #1 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.				
Description:	<p>New 8-inch gravity line from upstream of Nottingham #1 Lift Station south, cross-country for approximately 100 feet, then cross-country east to Robin Hood Lane, then along Robin Hood Lane northeast approximately 150-feet, then cross-country northeast 15th Street, then along 15th Street to Desert Woods Drive, then along Desert Woods Drive to Orion Drive, connecting to the new 30-inch SEI line.</p> <p>The decommissioning of Nottingham #1 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.</p>				
Required Preceding Projects:	1B, 60A				
Required Concurrent Projects:	-				
Other Dependent Projects:	-				
Special Considerations:	<p>Cannot be constructed prior to SEI Phase 2.</p> <p>Part of proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.</p>				
<b>Project ID</b>	<b>Type of Improvement</b>	<b>Unit</b>	<b>Diameter</b>	<b>From</b>	<b>To</b>
65A	Trenched Gravity Sewer	4,800 LF	8-inch	Nottingham #1 Lift Station	SEI MH
<b>Total Piping Estimate</b>					<b>\$1,081,000</b>
65B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$1,109,000</b>

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**City of Bend  
Collection System  
Master Plan**

**Capital Improvement  
Project**



HB01 Project 12-1354 GIS/SD7 - CIP/CIP Project Plates/CIP Project ID: 8.5x11 DRAFT 65 Nottingham 1 Diversion.mxd 6/20/2014 2:21:39 PM mac

June 2014 12-1354

# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 66A and 66B

Project Name: Nottingham #2 Lift Station Decommission - Gravity Sewer Diversion

From: Nottingham #2 Lift Station

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: This improvement allows the contributing area of Nottingham #2 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line from Nottingham #2 Lift Station east, cross-country to Sherwood Forest Drive, then along Sherwood Forest Drive southeast approximately 400 feet, then cross-country southeast to 15th Street, connecting to new 24-inch SEI line. The decommissioning of Nottingham #2 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
66A	Trenched Gravity Sewer	1,600 LF	12-inch	Nottingham #2 Lift Station	SEI MH
<b>Total Piping Estimate</b>					<b>\$413,000</b>
66B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$441,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 67A and 67B



**Project Name:** Ridgewater #2 Lift Station Decommission - Gravity Sewer Diversion

From: Ridgewater #2 Lift Station  
To: SEI MH  
Project Category: Hydraulic Capacity  
Implementation  
Timeframe: 6 to 10 year

Objective: This improvement allows the contributing area of Ridgewater #2 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Ferguson Road between Ladera Road and King Solomon Lane, connecting to new 24-inch SEI line. The decommissioning of Ridgewater #2 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A

Required Concurrent Projects: -

Other Dependent Projects: 62A, 62B

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
67A	Trenched Gravity Sewer	1,000 LF	8-inch	Ridgewater #2 Lift Station	SEI MH
<b>Total Piping Estimate</b>					<b>\$860,000</b>
67B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$888,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 68

### Project Name: River Rim Parallel Force Main

Location: Along Water Front Court from River Rim Lift Station to Charleswood Lane, then River Rim Lift Station  
From: CMH001647  
To: Charleswood Lane  
Project Category: Hydraulic Capacity  
Implementation Timeframe: 6 to 10 year

Objective: Increase the hydraulic conveyance capacity of the lift station to accommodate future flows.

Description: Parallel 4-inch force main along Water Front Court from River Rim Lift Station to Charleswood Lane, then along Charleswood Lane to Creek Stone Loop, then along Creek Stone Loop to River Rim Drive, then along River Rim Drive to Brookswood Boulevard, connecting to existing 8-inch gravity line.

Required Preceding Projects: -

Required Concurrent Projects: -

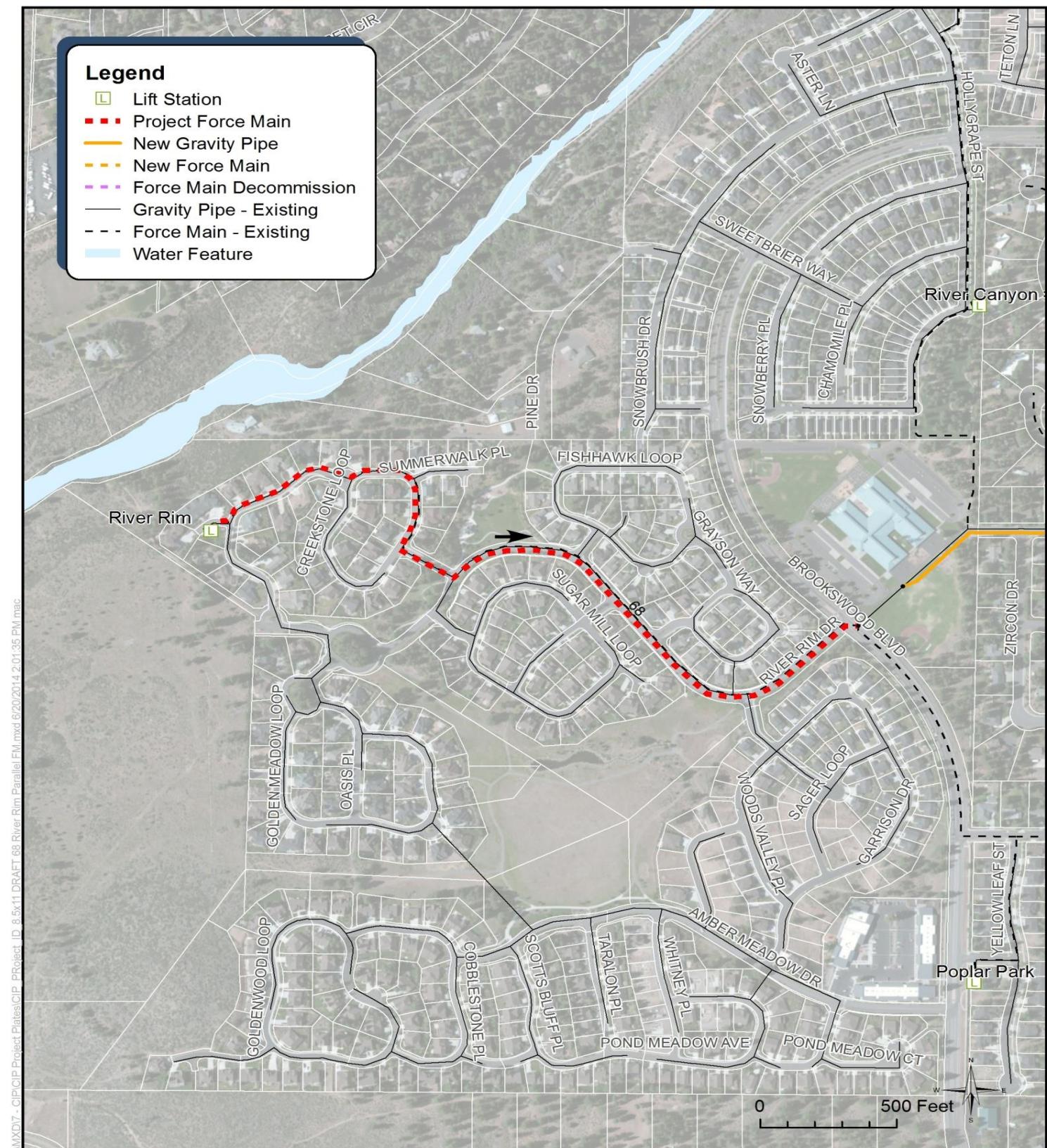
Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
68	Trenched Force Main	3,400 LF	4-inch	River Rim Lift Station	CMH001647

**Total Project Estimate** \$718,000

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**City of Bend**  
Collection System  
Master Plan

**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 69

Project Name: Plant Interceptor Upsize

From: CMH000191

To: CMH000189

Project Category: Hydraulic Capacity

Implementation

Timeframe: 6 to 10 year

Objective: Increase the hydraulic capacity of a segment of the Plant Interceptor to accommodate future flows.

Description: New 42-inch line to replace existing 36-inch line going northeast, cross-country from approximately 600 feet northeast of Hamehook Road and Pioneer Road intersection.

Required Preceding

Projects: -

Required Concurrent

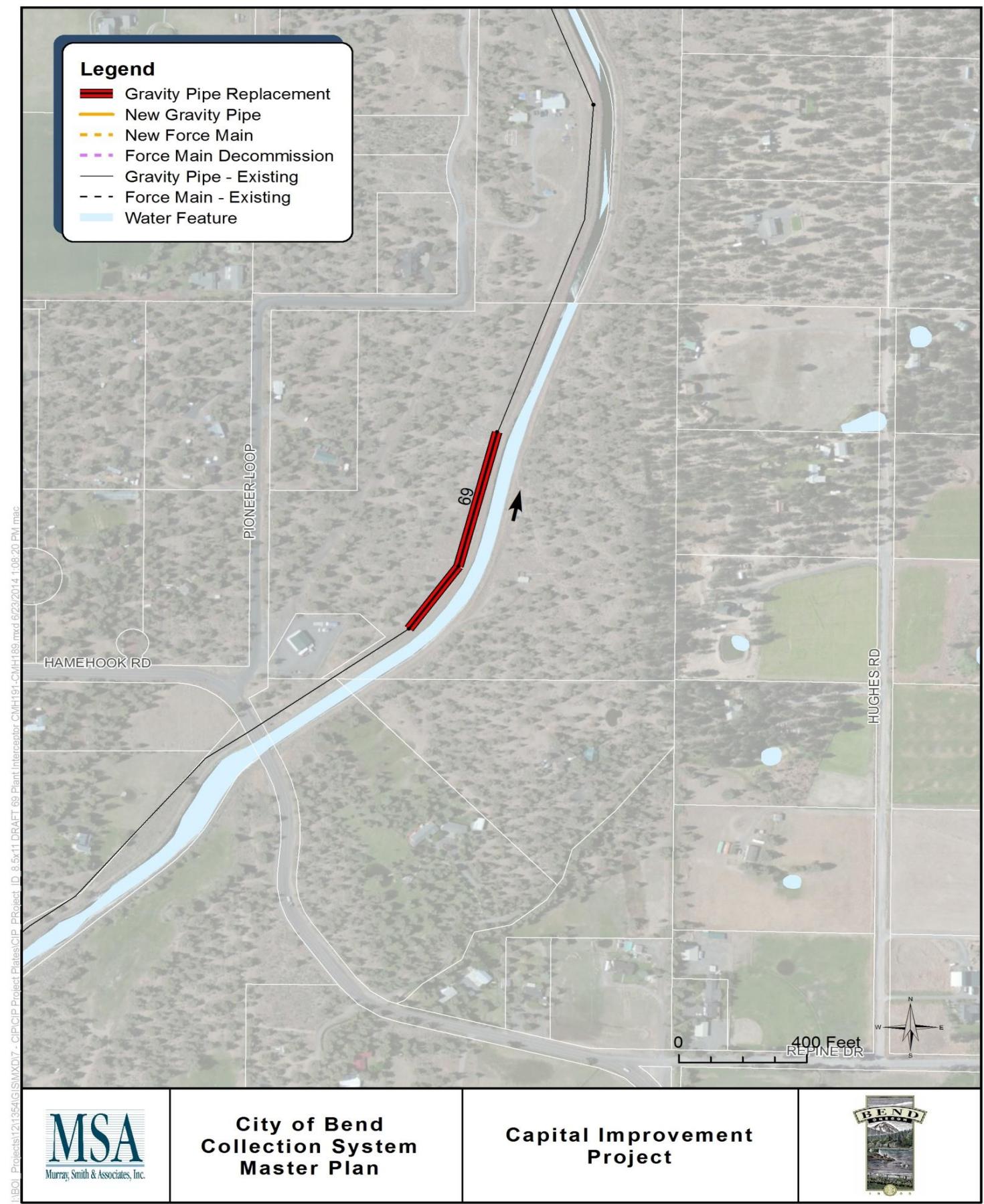
Projects: -

Other Dependent Projects: -

Special Considerations: Project requires bypass pumping during construction to transfer sewer around project.

Project ID	Type of Improvement	Unit	Diameter	From	To
69	Trenched Gravity Sewer Upgrade	500 LF	42-inch	CMH000191	CMH000190
69	Trenched Gravity Sewer Upgrade	300 LF	42-inch	CMH000190	CMH000189
<b>Total Project Estimate</b>					<b>\$488,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: **70**

<b>Project Name:</b>	<b>Aspen Ridge Lift Station Hydraulic Replacement</b>	
Location:	19689 Aspen Ridge Drive	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	6 to 10 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Replacement of existing facility with a new lift station to accommodate upgrades in capacity. Project includes new pumps, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	
<b>Project ID</b>	<b>Type of Improvement</b>	<b>Required Buildout Capacity</b>
70	Lift Station Replacement	170 gpm
<b>Total Project Estimate</b>		<b>\$1,042,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 71



Project Name:	Old Mill Lift Station Hydraulic Upgrade
Location:	51 SW Powerhouse Drive
Project Category:	Hydraulic Capacity
Implementation	
Timeframe:	6 to 10 year
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.

Project ID	Type of Improvement	Required Buildout Capacity
71	Lift Station Upgrade	340 gpm
<b>Total Project Estimate</b>		<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 72

Project Name:	Quail Crossing Lift Station Hydraulic Replacement	
Location:	6333 Stonewood Drive	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	6 to 10 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Replacement of existing facility with a new lift station to accommodate upgrades in capacity. Project includes new pumps, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	
Project ID	Type of Improvement	Required Buildout Capacity
72	Lift Station Replacement	110 gpm
<b>Total Project Estimate</b>	<b>\$559,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 73



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Sawyer Park Lift Station Hydraulic Upgrade</b>
Location:	62999 O.B. Riley Road
Project Category:	Hydraulic Capacity
Implementation	
Timeframe:	6 to 10 year
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.

Project ID	Type of Improvement	Required Buildout Capacity
73	Lift Station Upgrade	800 gpm
<b>Total Project Estimate</b>		<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 74

Project Name: Repair/Replace Poor Condition Gravity Mains

Location: System Wide

Project Category: Improve Condition

Implementation

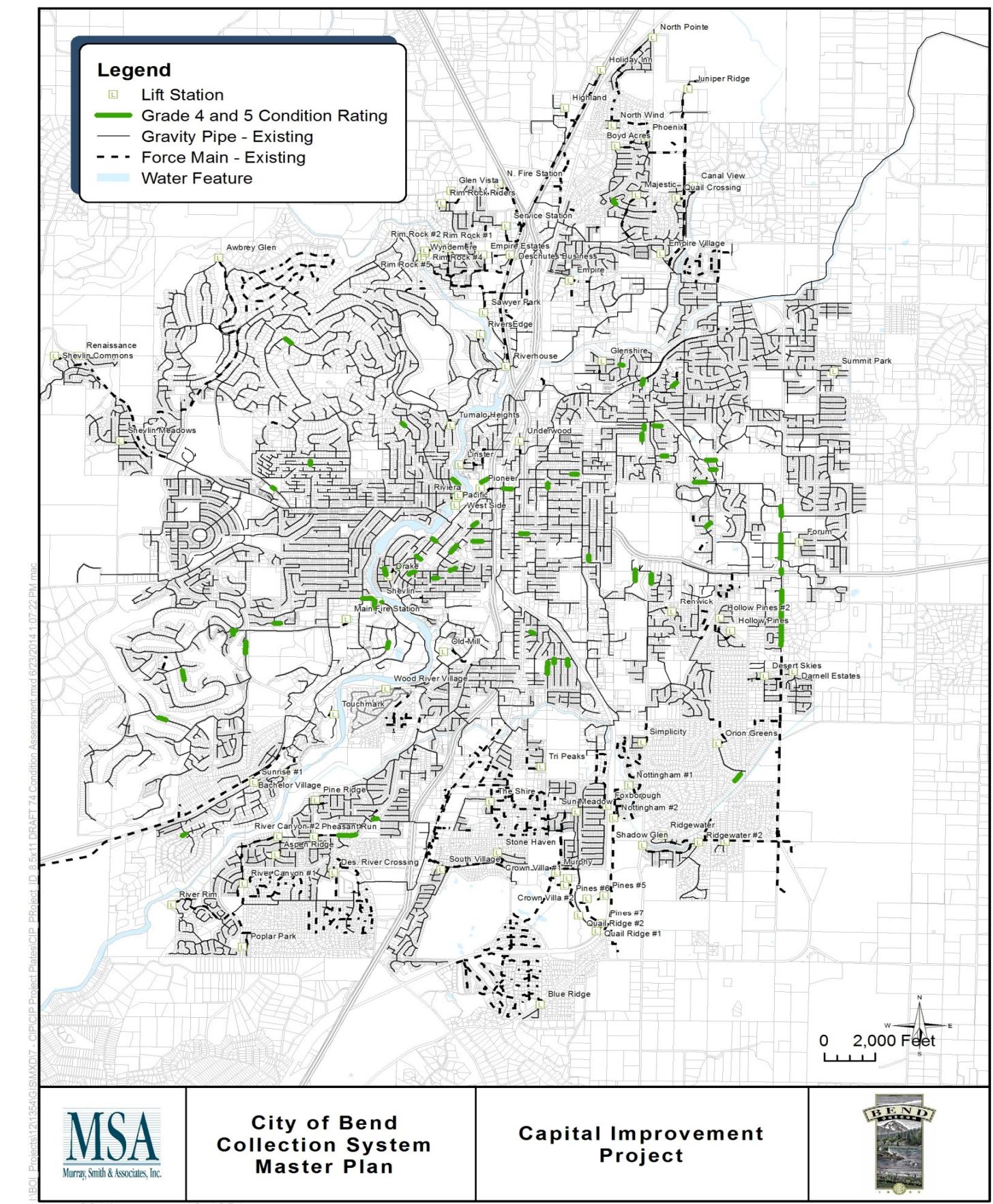
Timeframe: 6 to 10 year

Objective: Address known Grade 4 and 5 condition deficiencies in the gravity mains.

Description: Repair or replace gravity collection system that has been identified as condition deficient by the O&M Staff through their CCTV program. City O&M Staff to identify specific schedule for addressing deficient piping.  
 Grade 4 Assessment - 2.3 miles  
 Grade 4 Assessment - 1.1 miles

**Total Project Estimate** \$3,889,000

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 76



Project Name:	Empire Estates Lift Station Condition Upgrade
Location:	63151 Britta Street
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 77



Project Name:	Enchant on Deschutes Lift Station Condition Upgrade
Location:	63166 Riverstone
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 78



Project Name:	Glenshire Lift Station Condition Upgrade
Location:	1064 NE Glenshire Place
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and VFD.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 79



Project Name:	<b>Hollow Pines #2 Lift Station Condition Upgrade</b>
Location:	256 SE Soft Tail Drive
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and VFDs.

**Total Project Estimate** **\$345,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 80

Project Name:	<b>Majestic Lift Station Condition Upgrade</b>
Location:	63331 Majestic Loop
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: rail system.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 81



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Rivers Edge Lift Station Condition Upgrade</b>
Location:	3181 Quiet River Lane
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 82



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Widgi Creek Lift Station Condition Upgrade</b>
Location:	60679 Golf Village Loop
Project Category:	Improve Condition
Implementation	
Timeframe:	6 to 10 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, rail system and electrical components.

**Total Project Estimate** **\$345,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 83



<b>Project Name:</b>	<b>Plant Interceptor Condition Assessment Program</b>
Location:	Entire Plant Interceptor
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	6 to 10 year
Objective:	To evaluate the condition of the Plant Interceptor, grade components and recommend repair or replacement where appropriate.
Description:	Condition Assessment of the Plant Interceptor and Siphon. This inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. The Plant Interceptor is approximately 20,200 feet of 30-, 36- and 42-inch gravity pipe. The Siphon is approximately 4,900 feet of 21-inch and 36-inch parallel pipe. This project does not include assessment of any piping other than the Plant Interceptor. This project will serve as an update to the assessment conducted in 2013.

**Total Project Estimate** \$600,000

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 84



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>On-Call Hydraulic Modeling Services</b>
Location:	NA
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	6 to 10 year
Objective:	Maintaining an updated hydraulic model that accurately reflects existing conditions. Utilize the model for analyzing sewer flows and infrastructure needs.
Description:	Engineering services contract for use in maintaining the hydraulic sewer model. This contract will provide funds for a consultant to update the model piping and facilities, review and adjust the calibration, or run specific system analysis to identify required improvements or operational changes. This contract is intended to be utilized on an “as-needed” basis per City staff request. Funding level is \$100,000 per year. City Project ID SW111CA.
<b>Total Project Estimate</b>	<b>\$500,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 85



Project Name:	Collection System Master Plan Update
Location:	NA
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	6 to 10 year
Objective:	Update the collection system master plan based on recent growth, associated sewer loading and which capital projects have been implemented.
Description:	Engineering services contract to update the current Master Plan, document changes in the system, update the system analysis and CIP. The update will ensure the City is utilizing up-to-date and accurate information regarding the condition of the collection system, flow projections and applicable regulations.

**Total Project Estimate** **\$1,000,000**

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# City of Bend Collection System Master Plan Capital Improvement Project



Project ID: 86

Project Name: Large Gravity Main Condition Assessment Program - 6 to 10 year

Location: System Wide

Project Category: Miscellaneous Project

Implementation

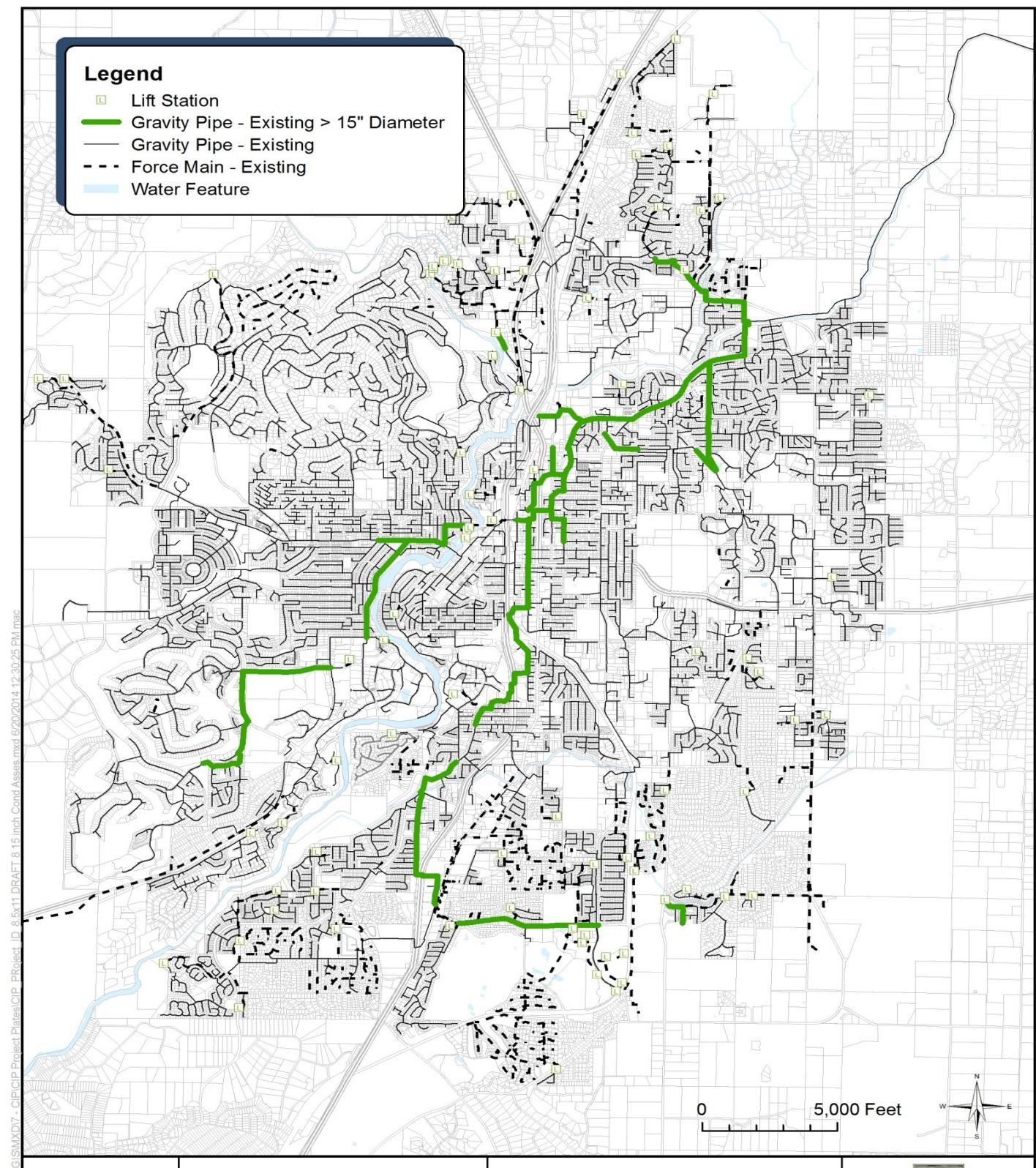
Timeframe: 6 to 10 year

Objective: To evaluate the condition of the existing trunk system, grade system components and recommend repair or replacement where appropriate.

Description: Establish a program to inspect the condition of existing gravity trunk collection system with diameters greater than 15 inches (approximately 4% of the collection system), grade the trunk system components, evaluate rehabilitation options and recommend the most effective solution. This type of inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. This project does not include condition assessment of the Plant Interceptor or Inverted Siphon. Funding level is \$200,000 per year.

**Total Project Estimate** **\$1,000,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 88A and 88B

**Project Name:** Blue Ridge Lift Station Decommission - Gravity Sewer Diversion

From: Blue Ridge Lift Station  
To: CMH009531  
Project Category: Hydraulic Capacity  
Implementation  
Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Blue Ridge Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Knott Road between Blue Ridge Lane and Country Club Drive, then along Country Club Drive to south of Murphy Road, connecting to proposed 18-inch SEI line south of the intersection. The decommissioning of Blue Ridge Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A

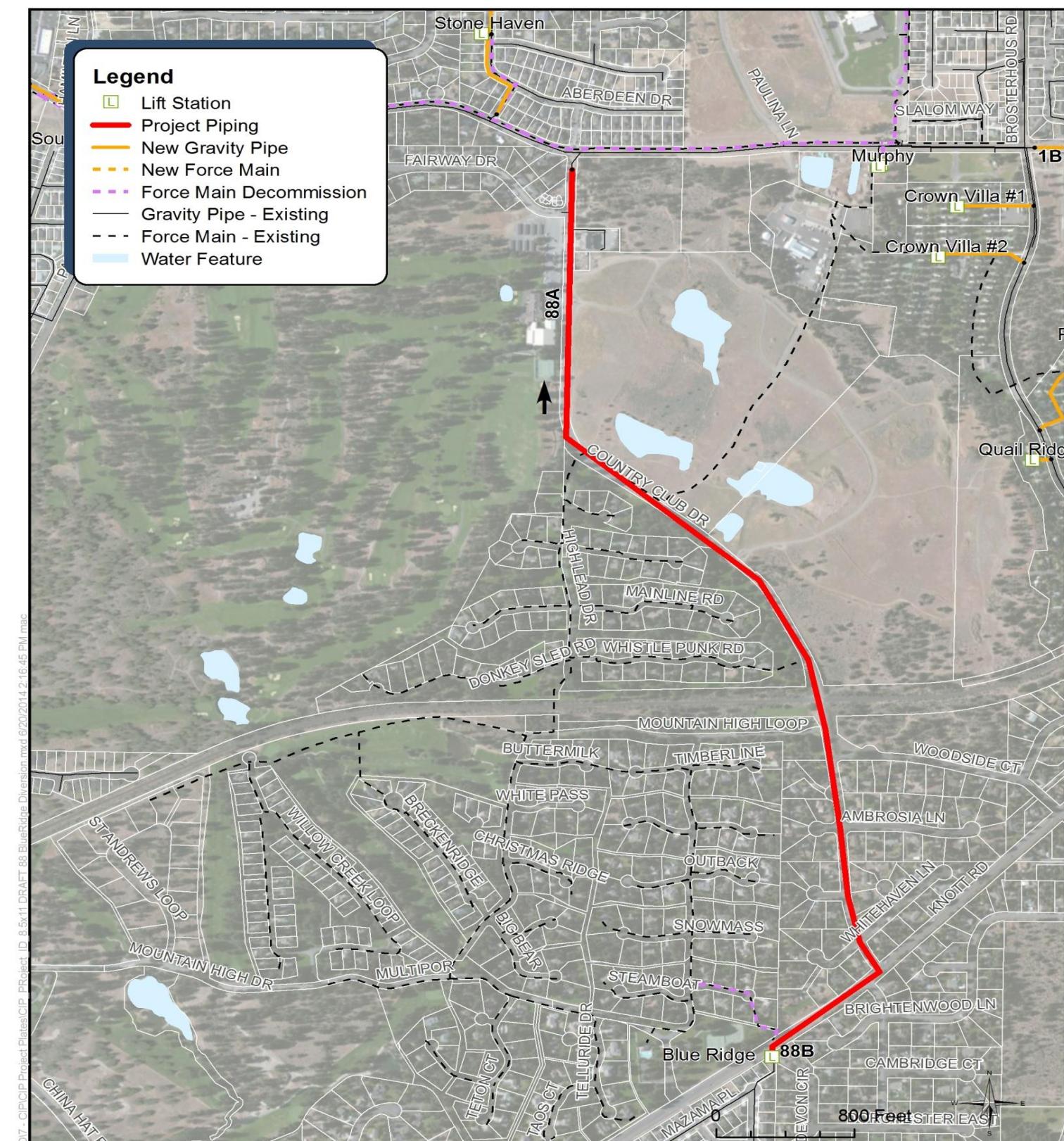
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
88A	Trenched Gravity Sewer	6,800 LF	8-inch	Blue Ridge Lift Station	CMH009531
<b>Total Piping Estimate</b>					<b>\$1,713,000</b>
88B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$1,741,000</b>

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## Capital Improvement Project



Project ID: 89A and 89B

**Project Name:** Darnell Estates Lift Station Decommission - Gravity Sewer Diversion

From: CMH005815

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Darnell Estates Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Darla Place between Darby Court and Darnel Avenue, then along Darnel Avenue to 27th Street, connecting to new 30-inch SEI line. The decommissioning of Darnell Estates Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

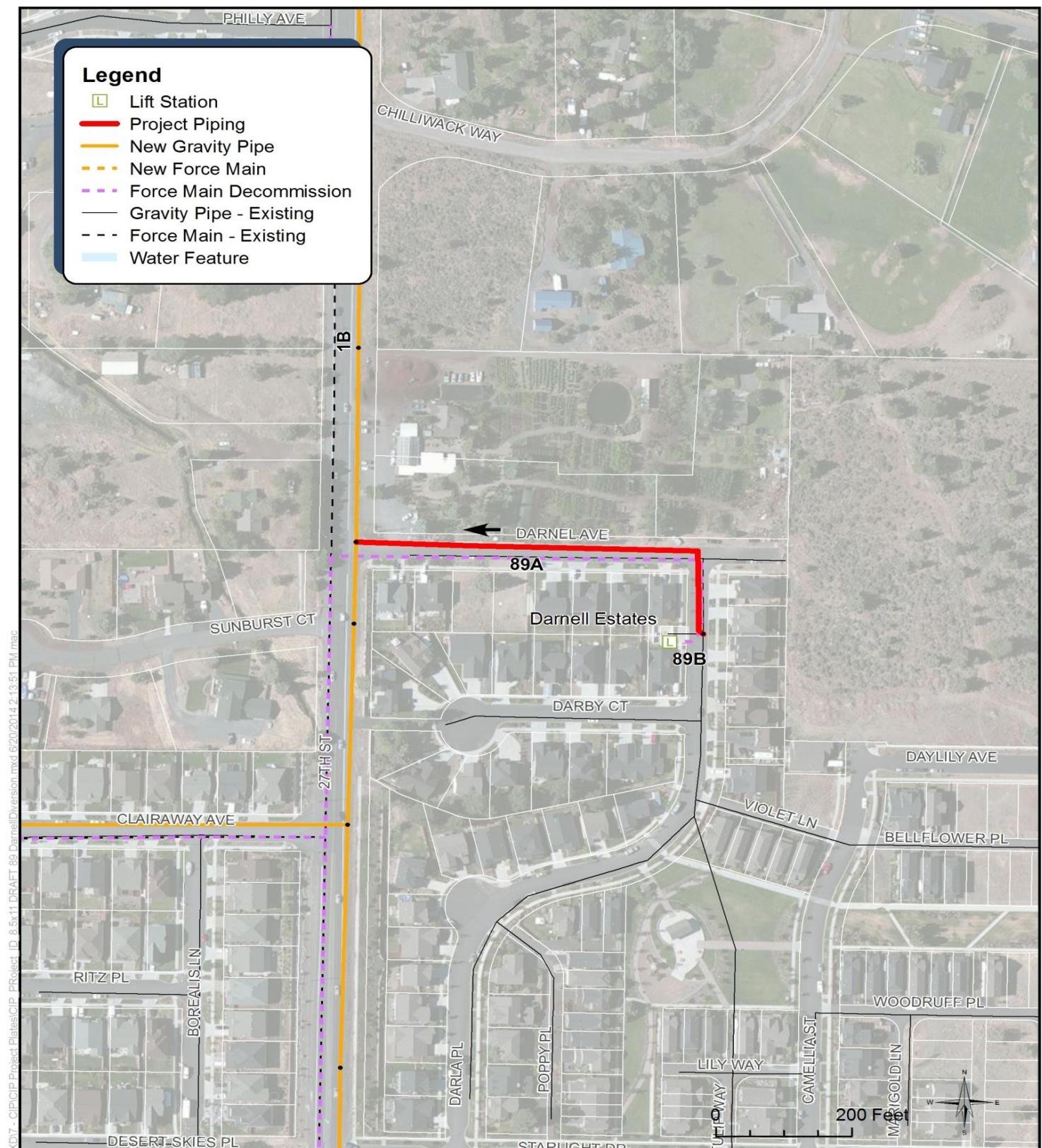
Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
89A	Trenched Gravity Sewer	700 LF	8-inch	CMH005815	SEI MH
<b>Total Piping Estimate</b>					<b>\$227,000</b>
89B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$255,000</b>

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## Capital Improvement Project



Project ID: 90A and 90B

### Quail Ridge #1 Decommission - Gravity Sewer Diversion

**Project Name:**

From: Quail Ridge #1 Lift Station  
To: Gravity Pipe - CGM010066  
Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Quail Ridge #1 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line going northeast approximately 100-feet cross-country from Quail Ridge #1 Lift Station to Brosterhous Road connecting to existing 8-inch line northeast of Brosterhous and Windsor Drive intersection. The decommissioning of Quail Ridge #1 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

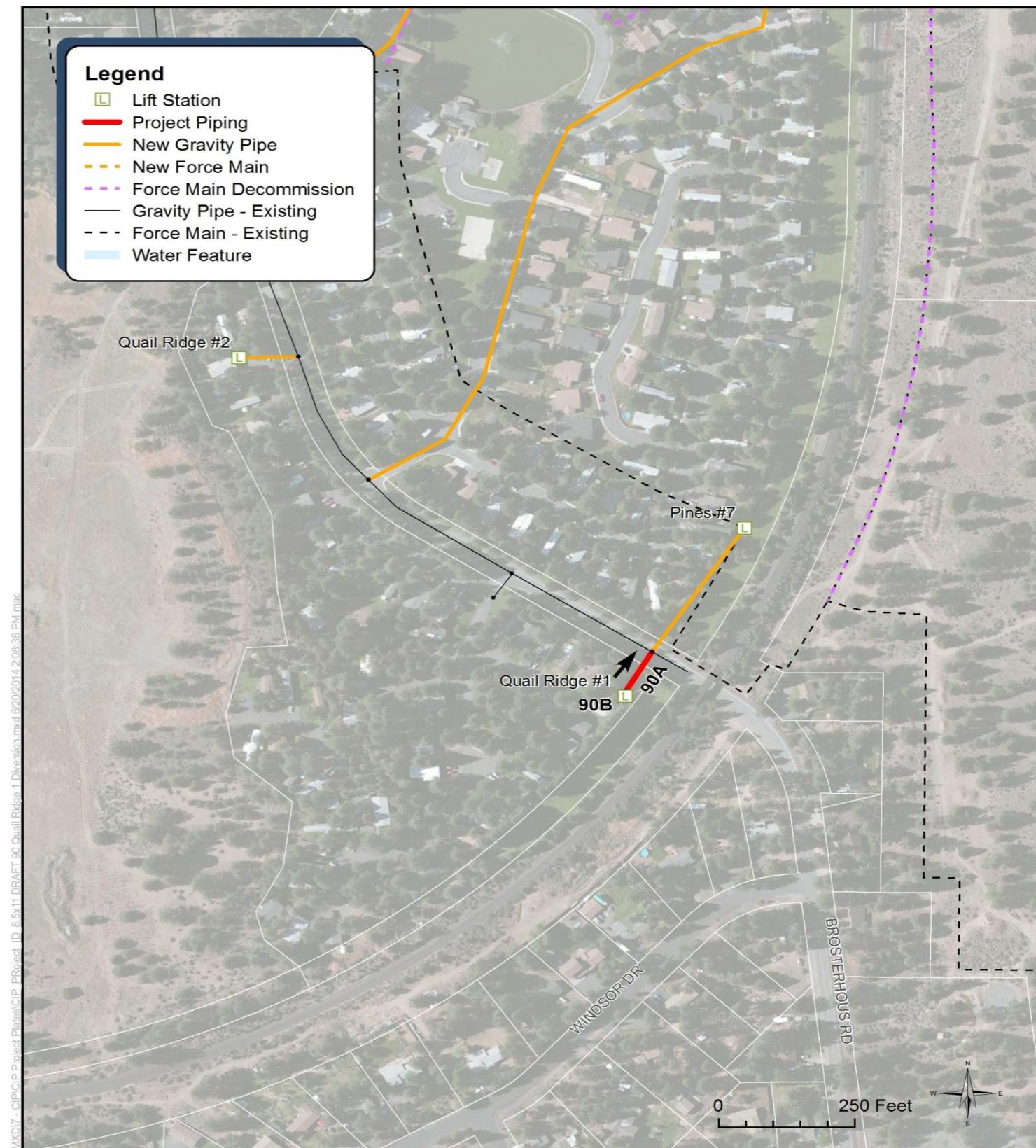
Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2. Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget. The downstream connection point in Brosterhous Road does not have an existing manhole at the connection point and one will be needed.

Project ID	Type of Improvement	Unit	Diameter	From	To
90A	Trenched Gravity Sewer	100 LF	8-inch	Quail Ridge #1 Lift Station	Gravity Sewer - Manhole Needed
<b>Total Piping Estimate</b>					<b>\$23,000</b>
90B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$51,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 91A and 91B

Project Name: Simplicity Lift Station Decommission - Gravity Sewer Diversion

From: Simplicity Lift Station

To: Project ID 65A

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Simplicity Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Hollis Lane between east of Lincoln Lane and 15th Street, then along 15th Street to Desert Woods Drive, connecting to new 8-inch line at the intersection.

The decommissioning of Simplicity Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A, 65A

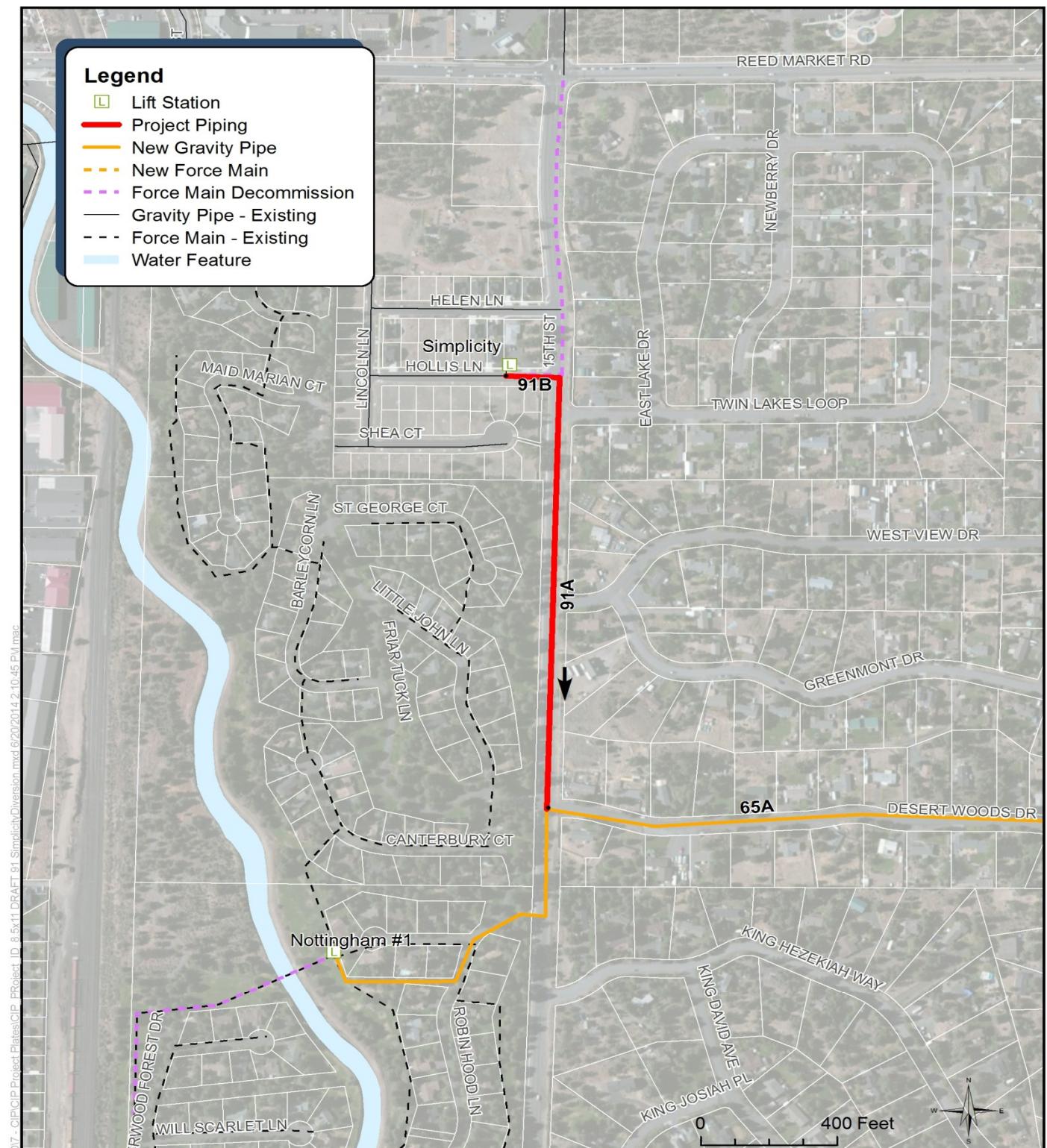
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
91A	Trenched Gravity Sewer	1,600 LF	8-inch	Simplicity Lift Station	Project ID 65
<b>Total Piping Estimate</b>					<b>\$355,000</b>
91B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$383,000</b>

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## Capital Improvement Project



Project ID: 92A and 92B

Project Name: Stone Haven Lift Station Decommission - Gravity Sewer Diversion

From: Stone Haven Lift Station

To: CMH009568

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Stone Haven Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Aberdeen Drive between approximately 200 feet south of Silver Sage and Broadmoor Way, then along Broadmoor Way to Murphy Road, connecting to new 18-inch SEI. The decommissioning of Stone Haven Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

Projects: -

Other Dependent Projects: 97A and 97B

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
92A	Trenched Gravity Sewer	700 LF	10-inch	Stone Haven Lift Station	CMH009566
<b>Total Piping Estimate</b>					<b>\$241,000</b>
92B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$269,000</b>

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## Capital Improvement Project



Project ID: 93A and 93B

Project Name: Summit Park Lift Station Decommission - Gravity Sewer Diversion

From: CMH005472

To: SEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Summit Park Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Wells Acres Road between Promise Place and 27th Street, connecting to new 30-inch SEI line.

The decommissioning of Summit Park Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

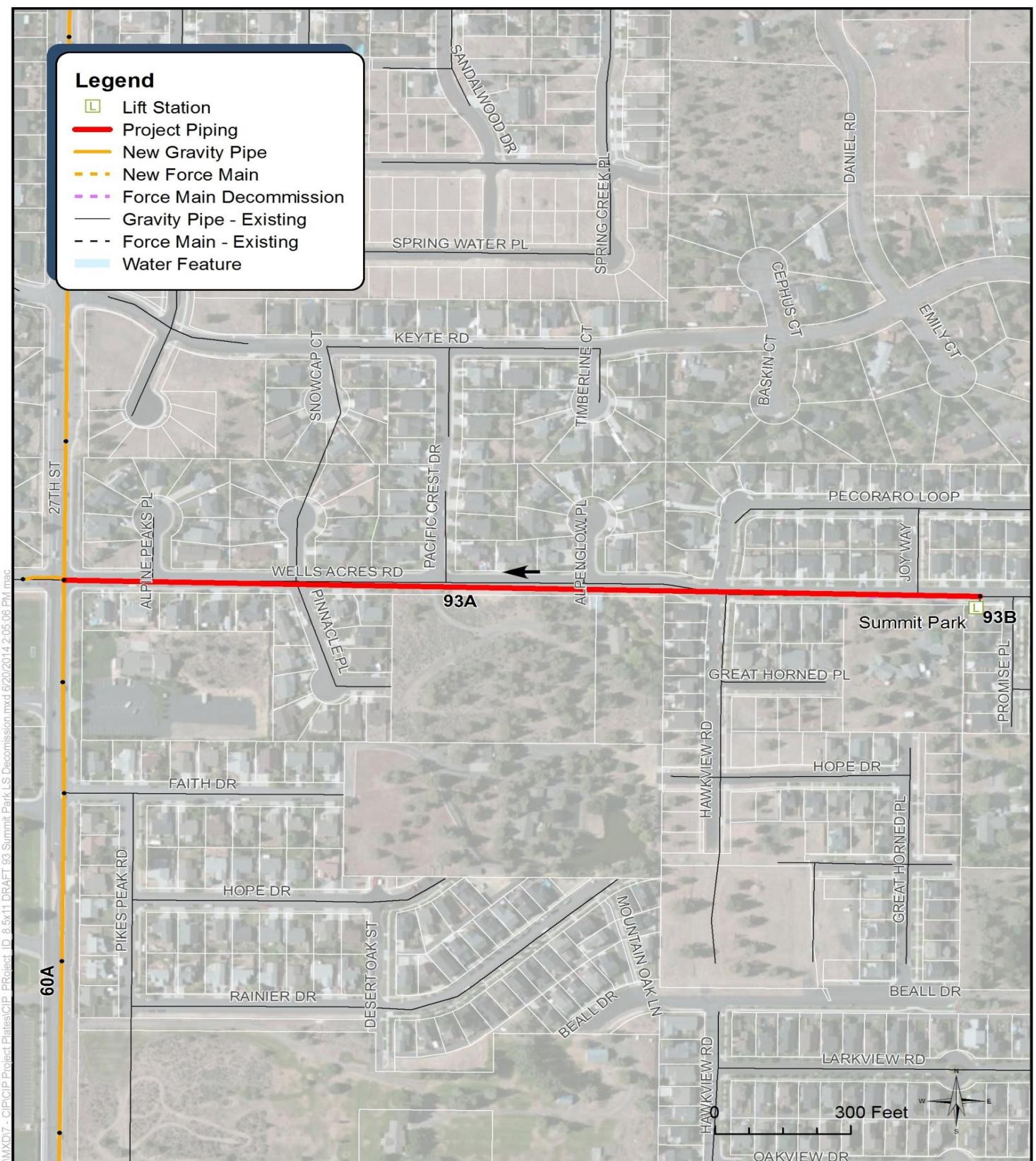
Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
93A	Trenched Gravity Sewer	2,100 LF	8-inch	CMH005472	SEI MH
<b>Total Gravity Piping Estimate</b>					<b>\$514,000</b>
93B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$542,000</b>

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## Capital Improvement Project



Project ID: 94A and 94B

Project Name: The Pines #5 Lift Station Decommission - Gravity Sewer Diversion

From: The Pines #5 Lift Station  
To: Gravity Pipe - CGM010064  
Project Category: Hydraulic Capacity

Implementation  
Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of The Pines #5 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line going southwest cross-country from Pines #5 Lift Station to Brosterhous Road, connecting to existing 8-inch line northwest of Brosterhous Road and Windsor Drive intersection.  
The decommissioning of The Pines #5 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A

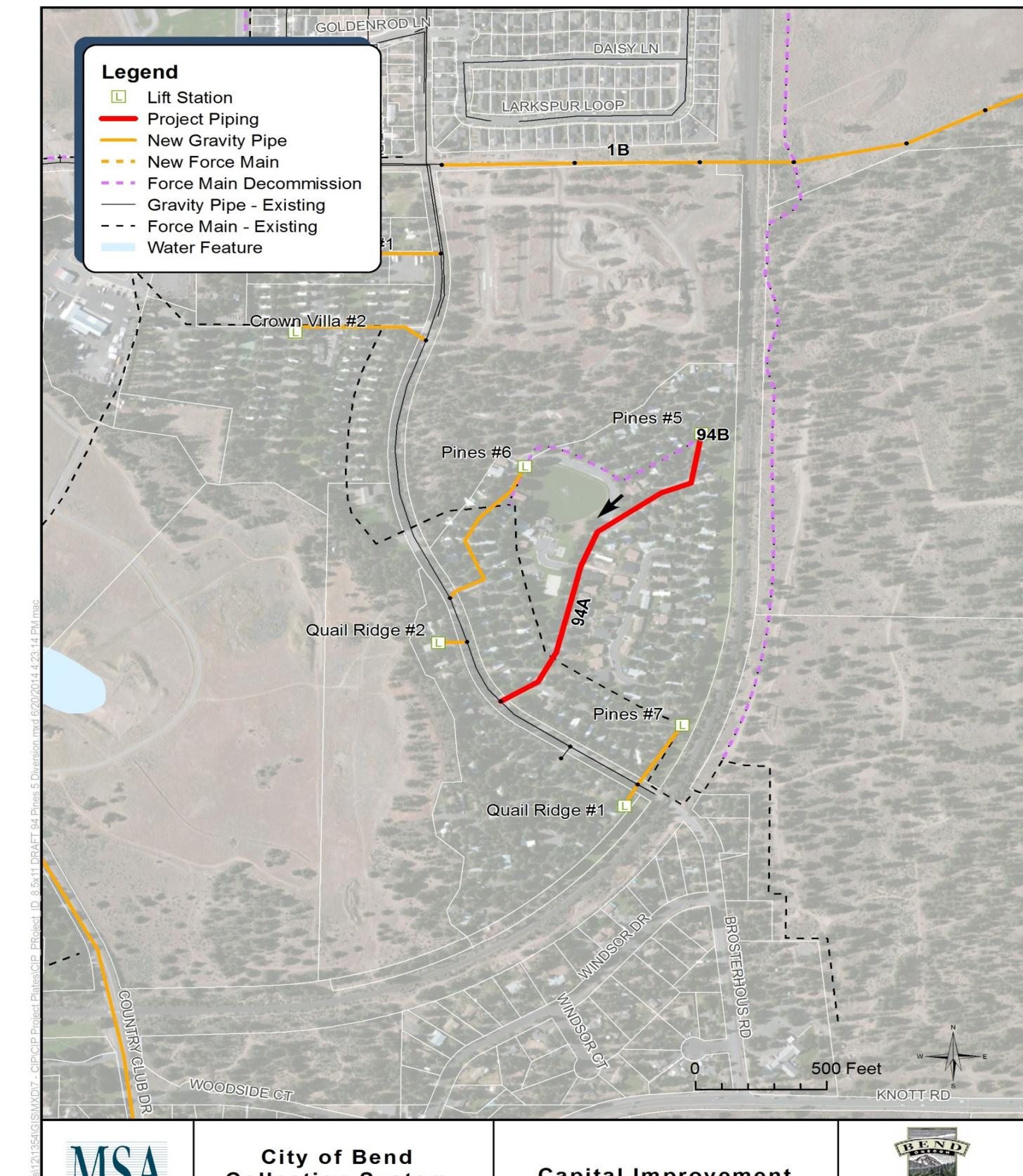
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.  
Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.  
The downstream connection point in Brosterhous Road does not have an existing manhole at the connection point and one will be needed.

Project ID	Type of Improvement	Unit	Diameter	From	To
94A	Trenched Gravity Sewer	700 LF	8-inch	Pines #5 Lift Station	Gravity Sewer - Manhole Needed
<b>Total Piping Estimate</b>					<b>\$146,000</b>
94B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$174,000</b>

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## Capital Improvement Project



Project ID: 95A and 95B

Project Name: The Pines #6 Lift Station Decommission - Gravity Sewer Diversion

From: The Pines #6 Lift Station

To: CMH009558

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of The Pines #6 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line going southwest cross-country from Pines #6 Lift Station to Brosterhous Road, connecting to existing 8-inch line south of Murphy Road and Brosterhous Road intersection.

The decommissioning of Pines #6 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 1B, 60A

Required Concurrent

Projects: -

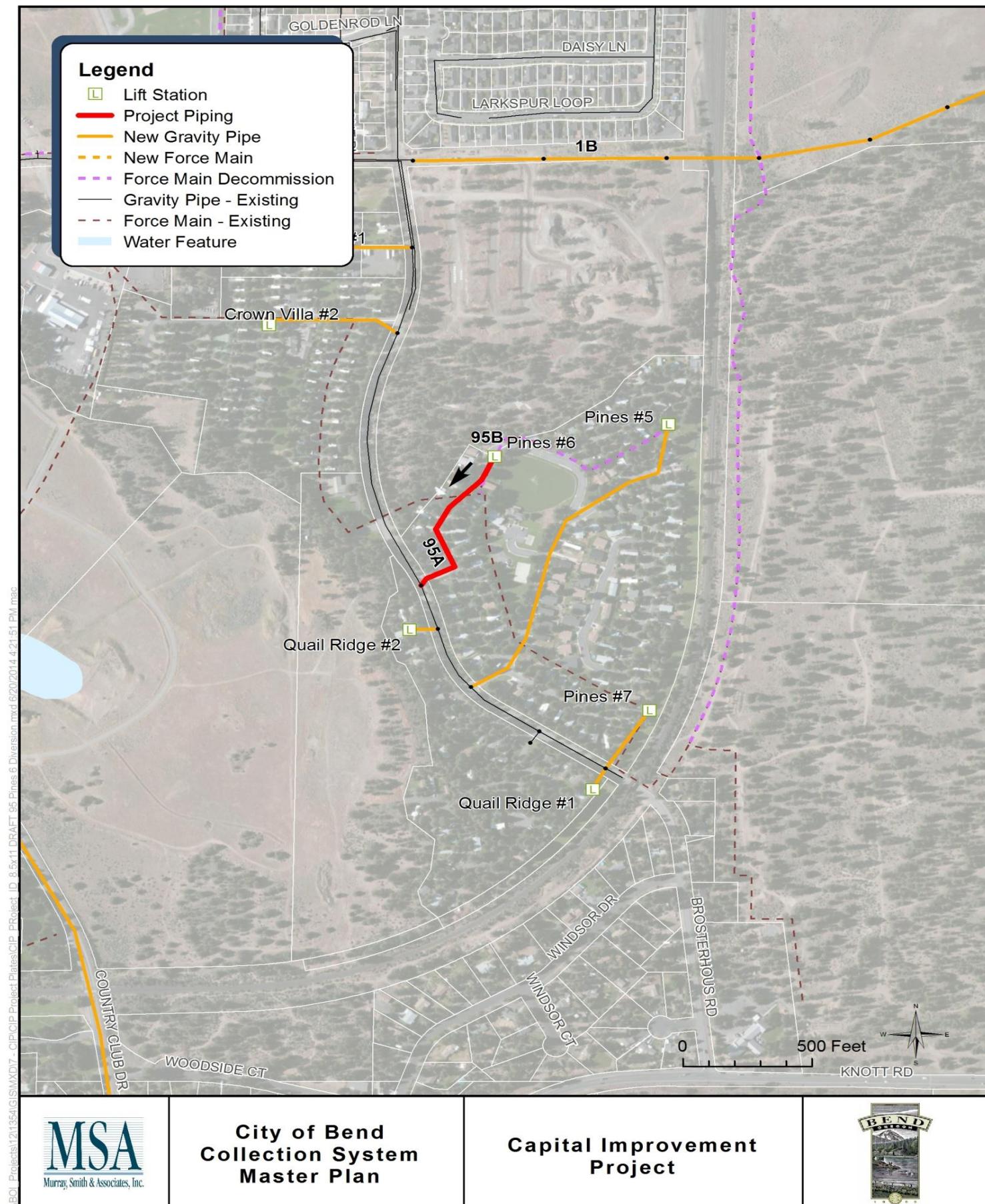
Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
95A	Trenched Gravity Sewer	1,500 LF	8-inch	Pines #6 Lift Station	CMH009558
<b>Total Piping Estimate</b>					<b>\$323,000</b>
95B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$351,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 96A and 96B

**Project Name:** The Pines #7 Lift Station Decommission - Gravity Sewer Diversion

From: The Pines #7 Lift Station  
 To: Gravity Pipe - CGM010066  
 Project Category: Hydraulic Capacity  
 Implementation  
 Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of The Pines #7 Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line going southwest, cross-country from Pines #7 Lift Station to Brosterhous Road, connecting to existing 8-inch line northwest of Brosterhous Road and Windsor Drive intersection.  
 The decommissioning of Pines #7 Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A

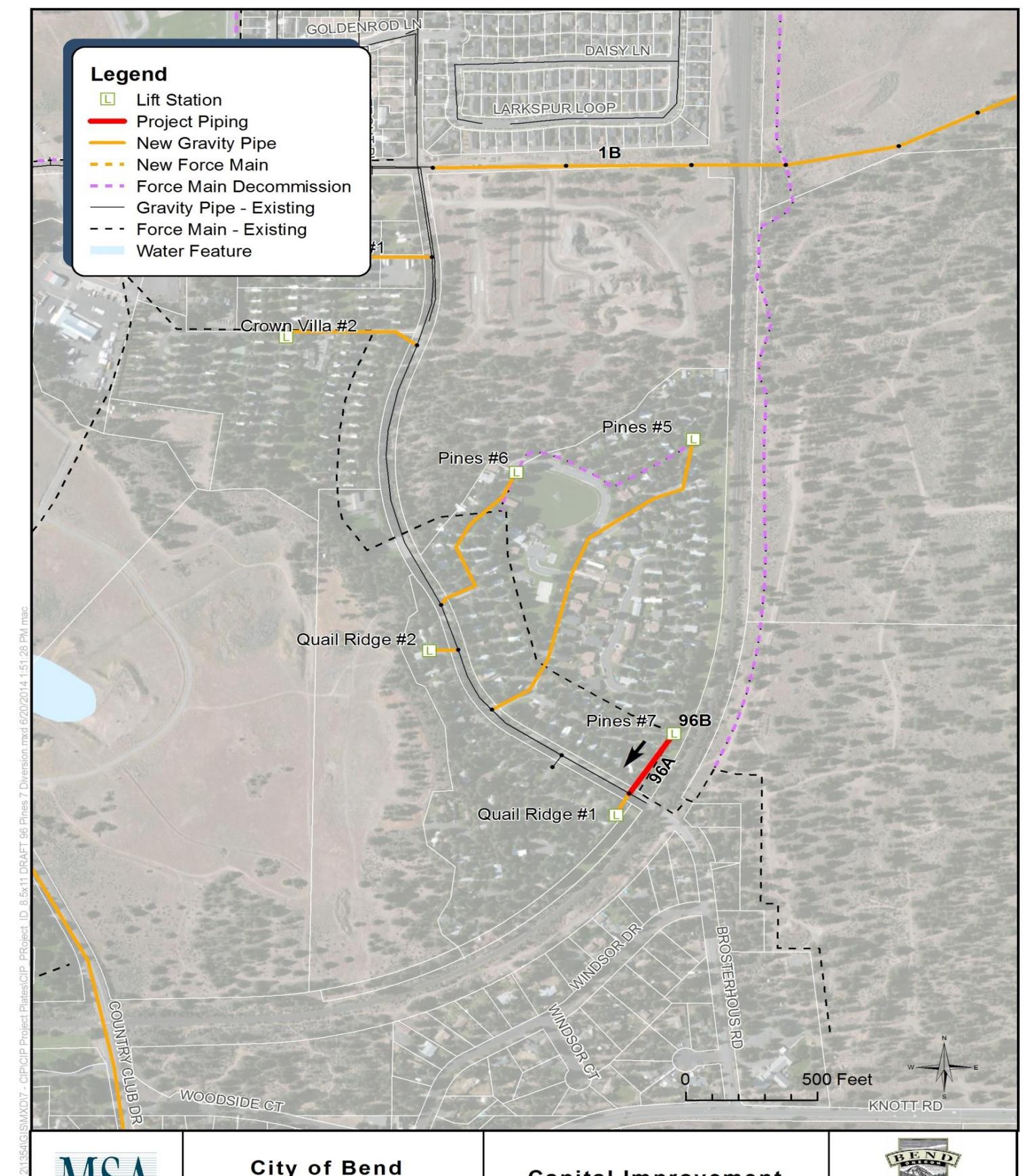
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.  
 Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.  
 The downstream connection point in Brosterhous Road does not have an existing manhole at the connection point and one will be needed.

Project ID	Type of Improvement	Unit	Diameter	From	To
96A	Trenched Gravity Sewer	400 LF	8-inch	Pines #7 Lift Station	Gravity Sewer - Manhole Needed
<b>Total Piping Estimate</b>					<b>\$71,000</b>
96B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$99,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 97A and 97B

Project Name: The Shire Lift Station Decommission - Gravity Sewer Diversion

From: The Shire Lift Station

To: CMH005957

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of The Shire Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Benham Road between south of Knightsbridge Place and Silver Sage Street, then along Silver Sage Street to Aberdeen Drive, then along Aberdeen Drive, connecting to new 10-inch line south of Silver Sage Street and Aberdeen Drive intersection.

The decommissioning of The Shire Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 1B, 60A, 92A

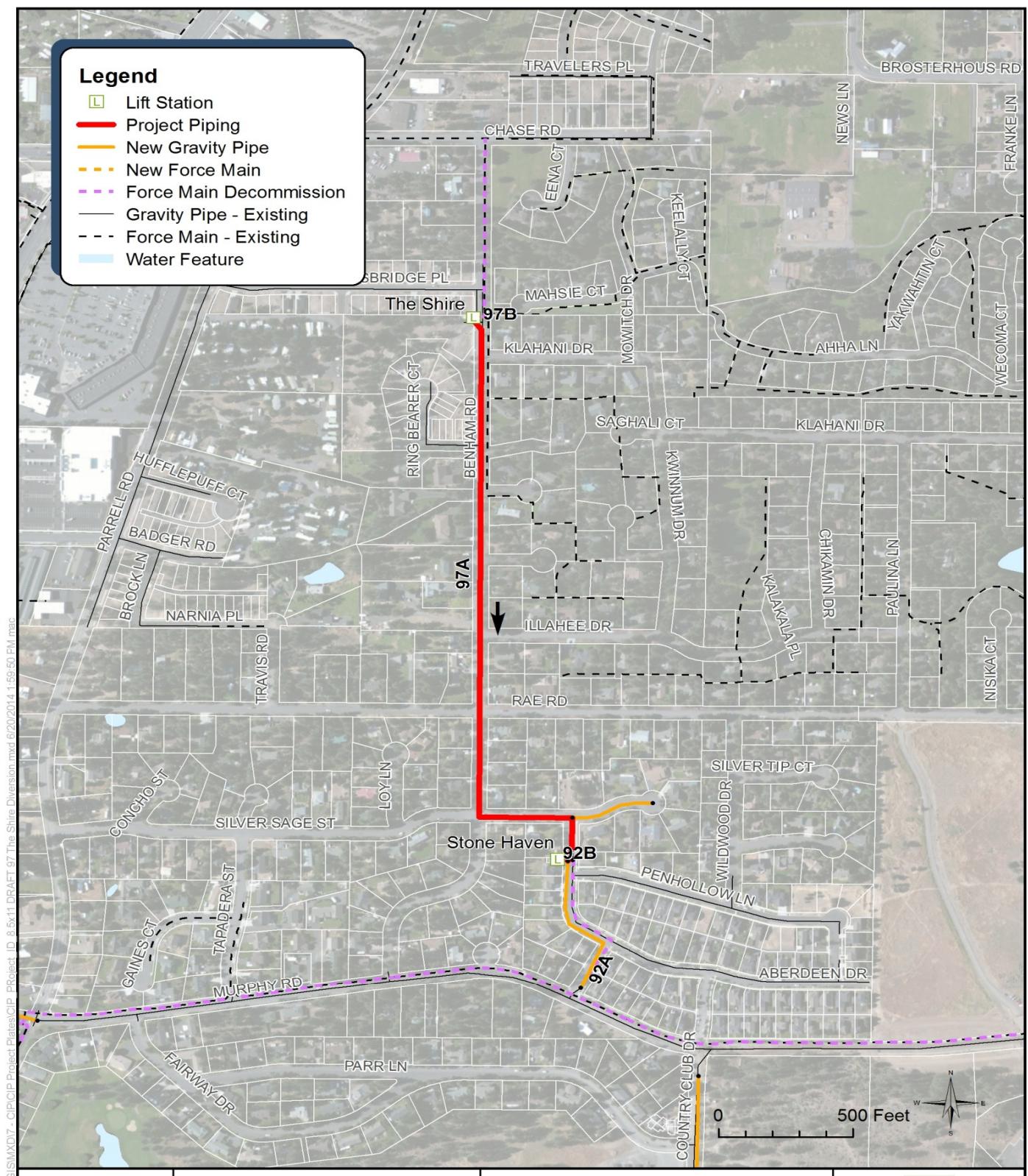
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to SEI Phase 2.

Project ID	Type of Improvement	Unit	Diameter	From	To
97A	Trenched Gravity Sewer	2,600 LF	8-inch	The Shire Lift Station	CMH005957
<b>Total Piping Estimate</b>					<b>\$1,761,000</b>
97B	Lift Station Decommission	1 EA	-	-	-
<b>Total Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$1,789,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

Project ID: 98

Project Name: Addison Avenue and Butler Market Gravity Improvement

From: CMH009036

To: CMH000325

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: Increase the hydraulic conveyance capacity of the local sewer system to accommodate existing and future flows and remove surcharged sewer.

Description: New 12-inch line along Addison Avenue between 4th Street and Butler Market Road, then new 18-inch line along Butler Market Road to 8th Street, connecting to existing 24-inch line.

Required Preceding  
Projects: -

Required Concurrent  
Projects: -

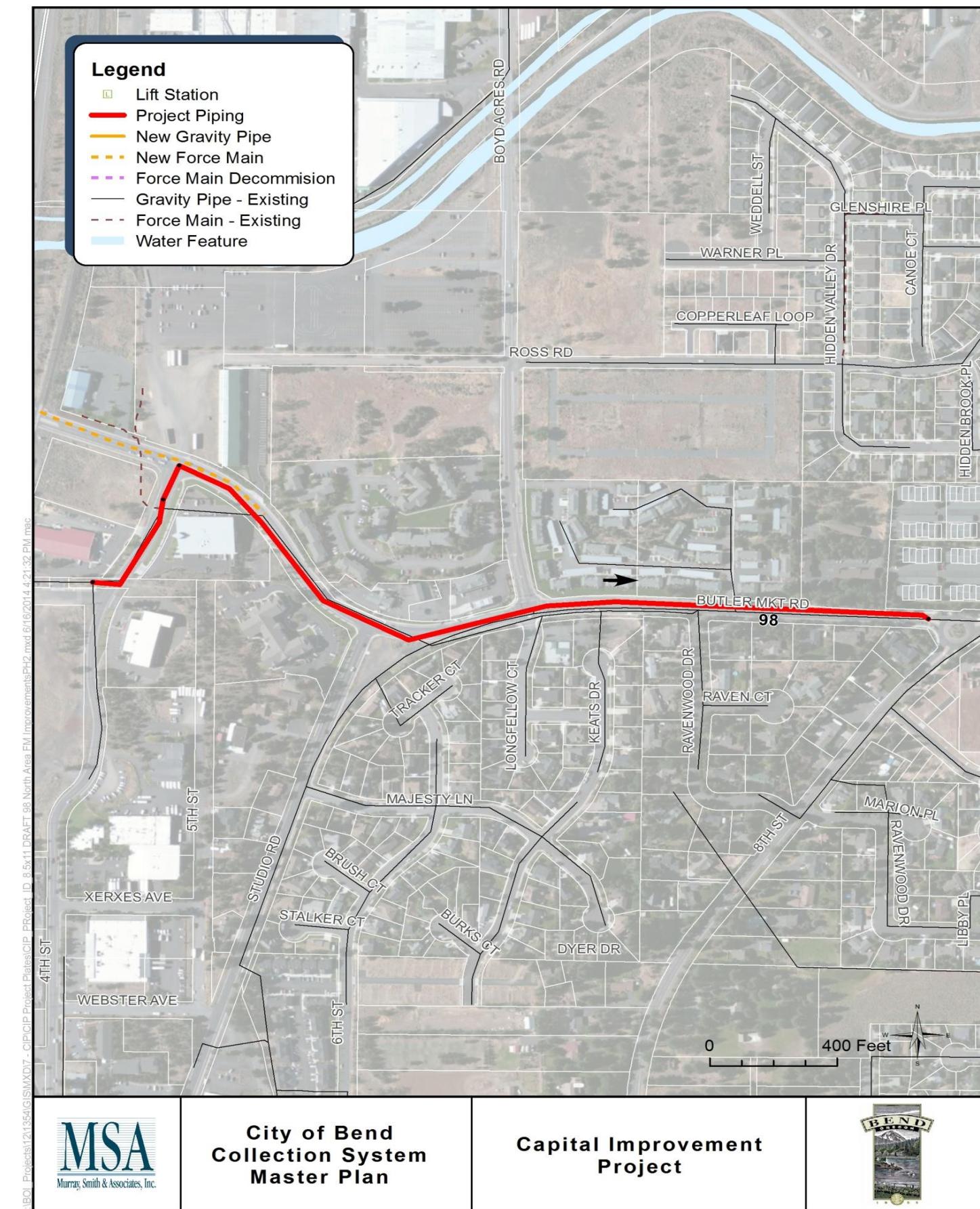
Other Dependent Projects: -

Special Considerations: -

Project ID	Type of Improvement	Unit	Diameter	From	To
98	Trenched Gravity Sewer	400 LF	12-inch	CMH009036	CMH002251
98	Trenched Gravity Sewer	2,800 LF	18-inch	CMH002251	CMH000325

**Total Project Estimate** \$1,512,000

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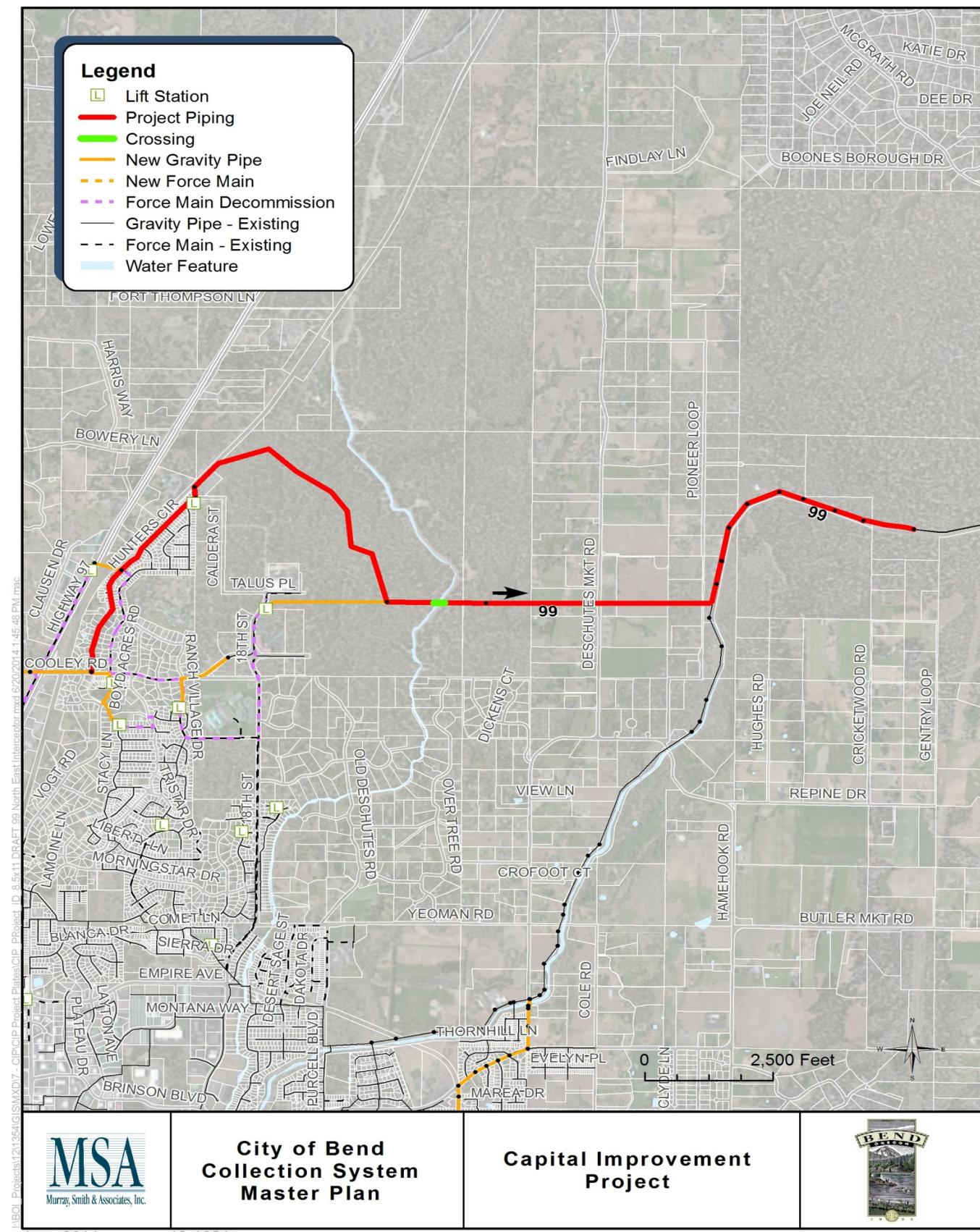


# **City of Bend Collection System Master Plan Capital Improvement Project**



Project ID: 99

<b>Project Name:</b>	<b>Northeast Interceptor (NEI)</b>
From:	NEI MH at Cooley Road and Hunters Circle
To:	Plant Interceptor Siphon (CSS000001)
Project Category:	Hydraulic Capacity
Implementation	
Timeframe:	11 to 20 year
Objective:	This improvement provides additional conveyance capacity, allowing for flow to be diverted away from hydraulically deficient infrastructure in the existing far north of the collection system. It enables city-owned lift stations to be decommissioned and also allows for service to currently unsewered properties within the UGB.
Description:	<p>This project starts as a new 8-inch gravity line along Hunters Circle between Cooley Road and Joseph Way, then continues as a 10-inch line along Hunters Circle between Joseph Way and approximately 300 feet northeast of Wellington Street, then continues as a 12-inch line cross-country, going northeast approximately 2,000 feet, then cross-country going southeast approximately 4,500 feet, then changing diameter to 18 inches, continuing cross-country east for approximately 6,500-feet, then parallels the Plant interceptor for approximately 900 feet, changing diameter to 24 inches for approximately 4,000 feet, with the last segment 36 inches up to the siphon.</p> <p>Project is initiated by dry weather peak flow trigger of 810 gpm at manhole CMH004010. See Project ID 9 for more information on Flow Monitoring Program.</p>
Required Preceding Projects:	-
Required Concurrent Projects:	-
Other Dependent Projects:	103A and 103B, 101A and 101B, 102A and 102B, 104A and 104B, 105A and 105B, 100A and 100B, 106A and 106B
Special Considerations:	<p>Prior to design and construction of the NEI, additional analysis should be conducted to evaluate whether to upsize the interceptor to convey additional future flows.</p> <p>Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.</p>



Project ID	Type of Improvement	Unit	Diameter	From	To
99	Trenched Gravity Sewer	2,500 LF	8-inch	NEI MH	NEI MH
99	Trenched Gravity Sewer	2,400 LF	10-inch	NEI MH	NEI MH
99	Trenched Gravity Sewer	6,100 LF	12-inch	NEI MH	NEI MH
99	Trenched Gravity Sewer	2,000 LF	18-inch	NEI MH	NEI MH
99	Trenched Gravity Sewer	5,400 LF	18-inch	NEI MH	NEI MH
99	Trenched Gravity Sewer	3,900 LF	24-inch	NEI MH	NEI MH
99	Trenched Gravity Sewer	1,100 LF	36-inch	NEI MH	CSS000001
<b>\$15,086,000</b>					

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 100A and 100B

**Project Name:** Boyd Acres Lift Station Decommission - Gravity Sewer Diversion

From: Boyd Acres Lift Station

To: Project ID 105

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Boyd Acres Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Stacy Lane, cross-country from Nicolette Drive northwest to Vogt Road and Hunters Circle intersection, then cross-country northeast to Stacy Lane, then along Stacy Lane, connecting to new 8-inch line south of Cooley Road.

The decommissioning of Boyd Acres Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 99, 105A

Required Concurrent

Projects: -

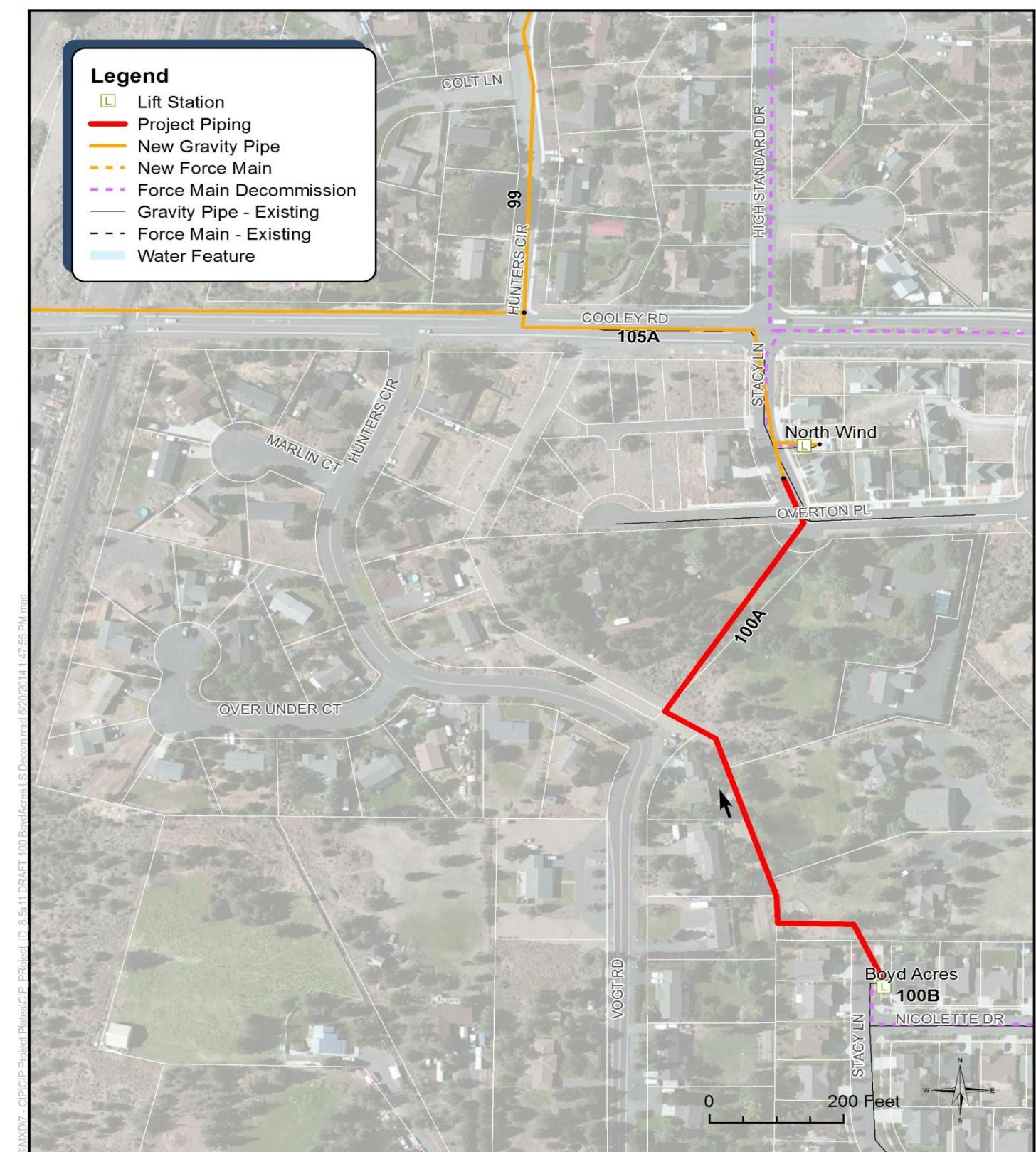
Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to NEI and gravity service decommissioning North Wind Lift Station (Project ID 105). Coordinate design size, alignment, connection point and invert with final design of NEI.

Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
100A	Trenched Gravity Sewer	1,100 LF	8-inch	Boyd Acres Lift Station	Project ID 105
<b>Total Gravity Piping Estimate</b>					<b>\$737,000</b>
100B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$765,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 101A and 101B

Project Name: Highland Lift Station Decommission - Gravity Sewer Diversion

From: CMH004787

To: NEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Highland Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line going south, cross-country from Highland Lift Station to Cooley Road, then along Cooley Road to Hunters Circle, connecting to new 8-inch Northeast Interceptor (NEI) line. The decommissioning of Highland Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 99

Required Concurrent

Projects: -

Other Dependent Projects: -

Special Considerations: Gravity pipeline includes highway crossing. Coordinate design size, alignment, connection point and invert with final design of NEI. Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
101A	Trenched Gravity Sewer	800 LF	8-inch	CMH004787	Project MH
101A	Trenched Gravity Sewer	1,000 LF	8-inch	Project MH	NEI MH
101A	Trenchless Highway Crossing	300 LF	8-inch	-	-

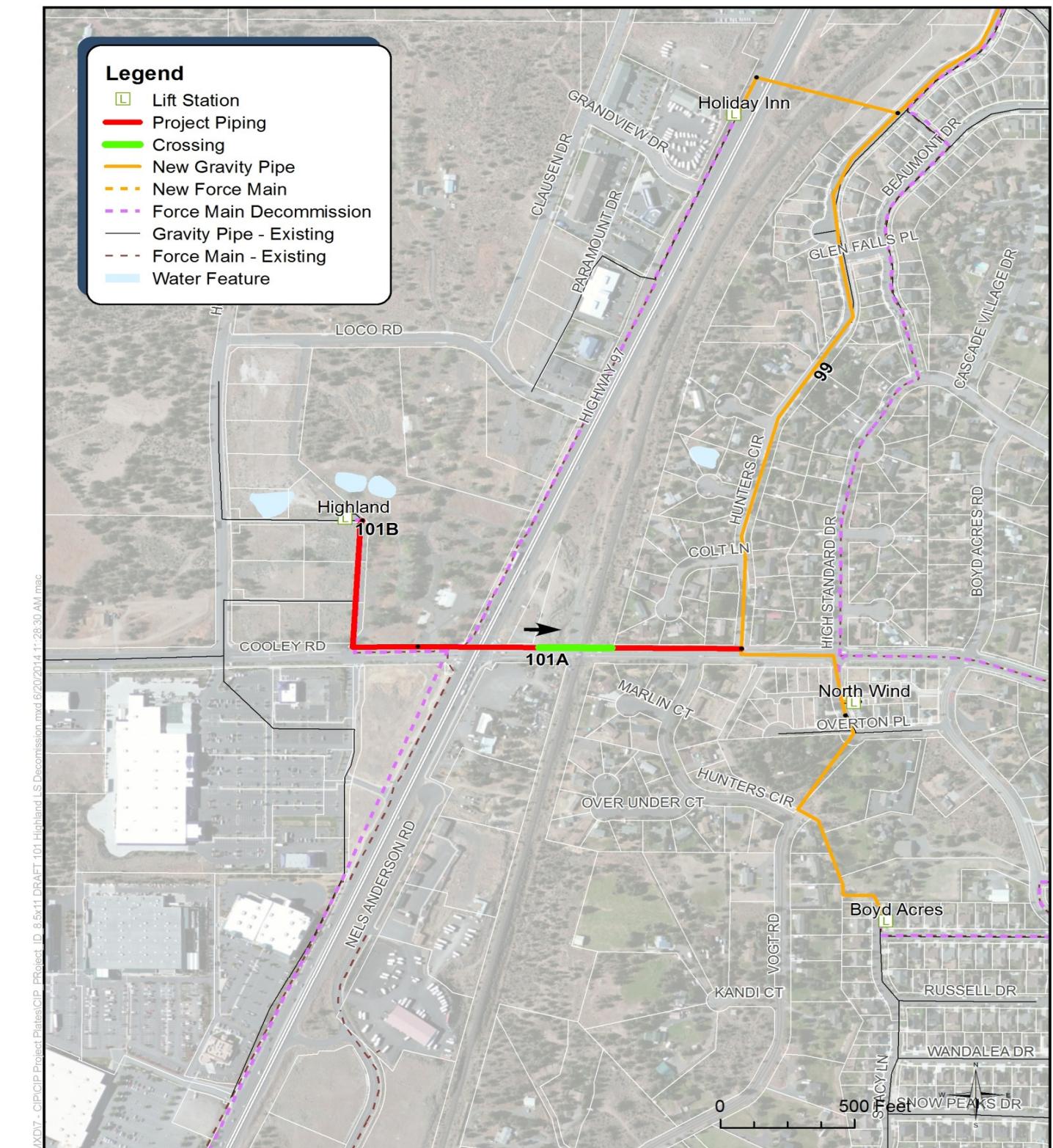
**Total Gravity Piping Estimate** \$1,398,000

101B Lift Station Decommission 1 EA - - -

**Total Lift Station Decommission Estimate** \$28,000

**Total Project Estimate** \$1,426,000

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 102A and 102B

Project Name: Holiday Inn Lift Station Decommission - Gravity Sewer Diversion

From: CMH003856

To: NEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Holiday Inn Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Highway 97 from Holiday Inn Lift Station for approximately 200-feet, then cross-country going east to Hunters Circle, connecting to new 10-inch NEI line at Hunters Circle and Joseph Way intersection. The decommissioning of Holiday Inn Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 99

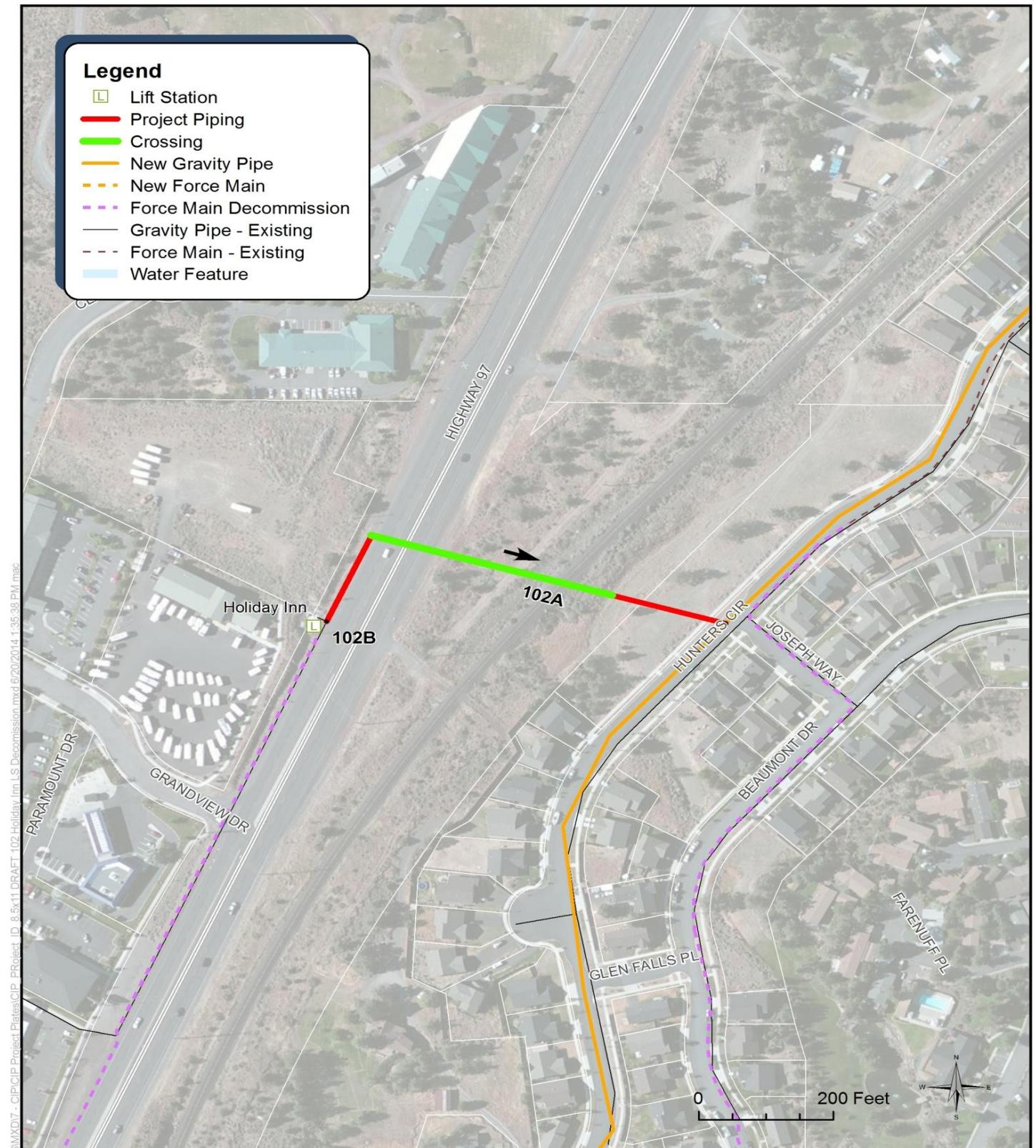
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Gravity pipeline includes highway crossing. Coordinate design size, alignment, connection point and invert with final design of NEI. Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Project ID	Type of Improvement	Unit	Diameter	From	To
102A	Trenched Gravity Sewer	200 LF	8-inch	CMH003856	Project MH
102A	Trenched Gravity Sewer	300 LF	8-inch	Project MH	NEI MH
102A	Trenchless Highway Crossing	300 LF	8-inch	-	-
<b>Total Gravity Piping Estimate</b>			<b>\$523,000</b>		
102B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>			<b>\$28,000</b>		
<b>Total Project Estimate</b>			<b>\$551,000</b>		

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 103A and 103B

Project Name: Juniper Ridge Lift Station Decommission - Gravity Sewer Diversion

From: Juniper Ridge Lift Station

To: Northeast Interceptor

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Juniper Ridge Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 10-inch gravity line going east approximately 2,400 feet cross-country from Juniper Ridge Lift Station, connecting to 18-inch NEI line.

The decommissioning of Juniper Ridge Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 99

Required Concurrent

Projects: -

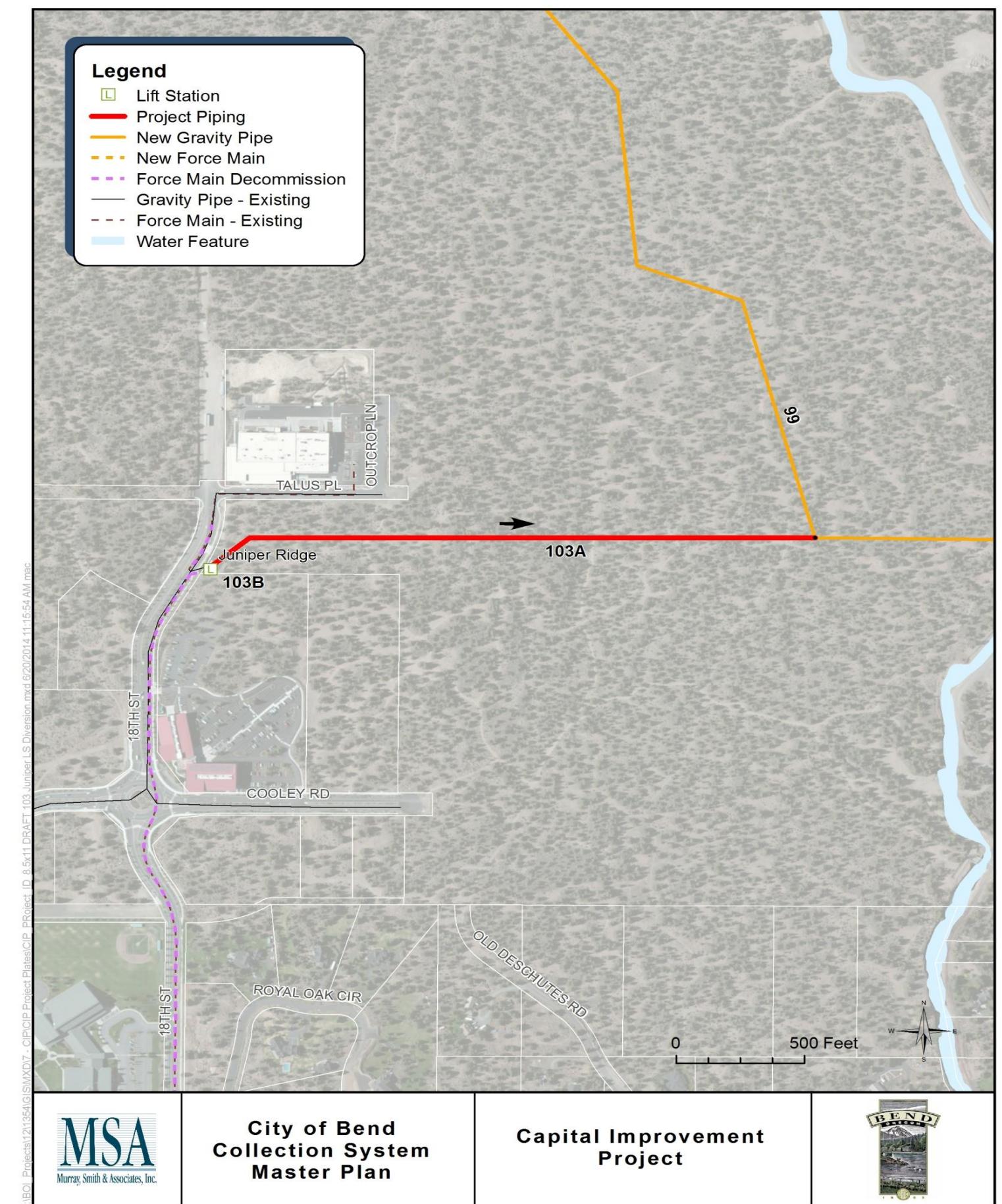
Other Dependent Projects: -

Special Considerations: Proposed pipeline alignment is not in right-of-way, requiring easement acquisition that is not included in the associated budget.

Coordinate design size, alignment, connection point and invert with final design of NEI.

Project ID	Type of Improvement	Unit	Diameter	From	To
103A	Trenched Gravity Sewer	2,500 LF	10-inch	Juniper Ridge Lift Station	NEI MH
<b>Total Gravity Piping Estimate</b>					<b>\$1,433,000</b>
103B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$1,461,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 104A and 104B

Project Name: North Pointe Lift Station Decommission - Gravity Sewer Diversion

From: CMH006383

To: MEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of North Pointe Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Hunters Circle from upstream of North Pointe Lift Station to the new 10-inch NEI line.

The decommissioning of North Pointe Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main and gravity main, which will be abandoned in place.

Required Preceding

Projects: 99

Required Concurrent

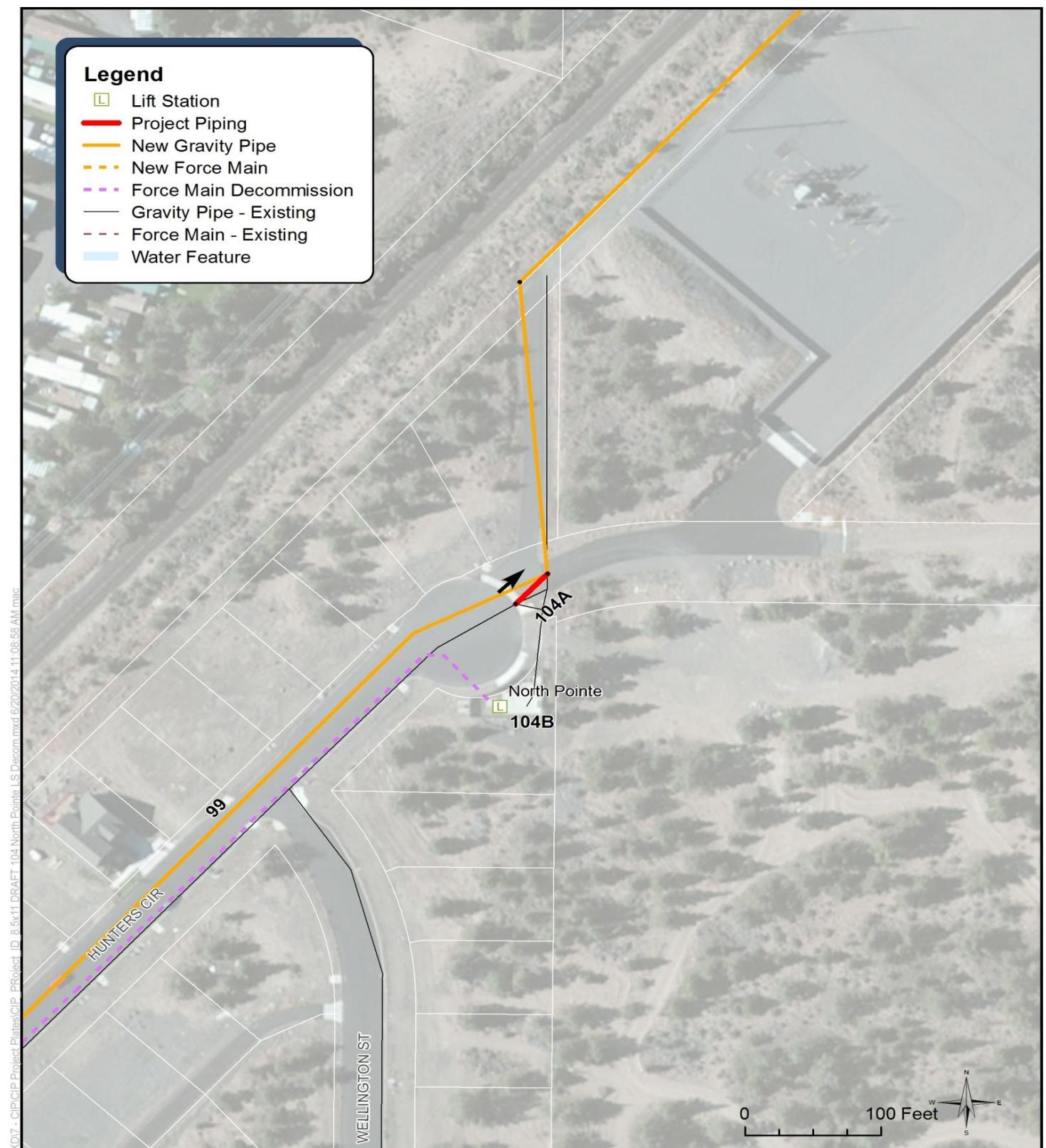
Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to NEI. Coordinate design size, alignment, connection point and invert with final design of NEI.

Project ID	Type of Improvement	Unit	Diameter	From	To
104A	Trenched Gravity Sewer	100 LF	8-inch	CMH006383	NEI MH
<b>Total Gravity Piping Estimate</b>					<b>\$19,000</b>
104B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$47,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 105A and 105B

Project Name: North Wind Lift Station Decommission - Gravity Sewer Diversion

From: North Wind Lift Station

To: NEI MH

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of North Wind Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Stacy Lane between Overton Place and Cooley Road, then along Cooley Road to Hunters Circle, connecting to new 8-inch NEI line. The decommissioning of North Wind Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding

Projects: 99

Required Concurrent

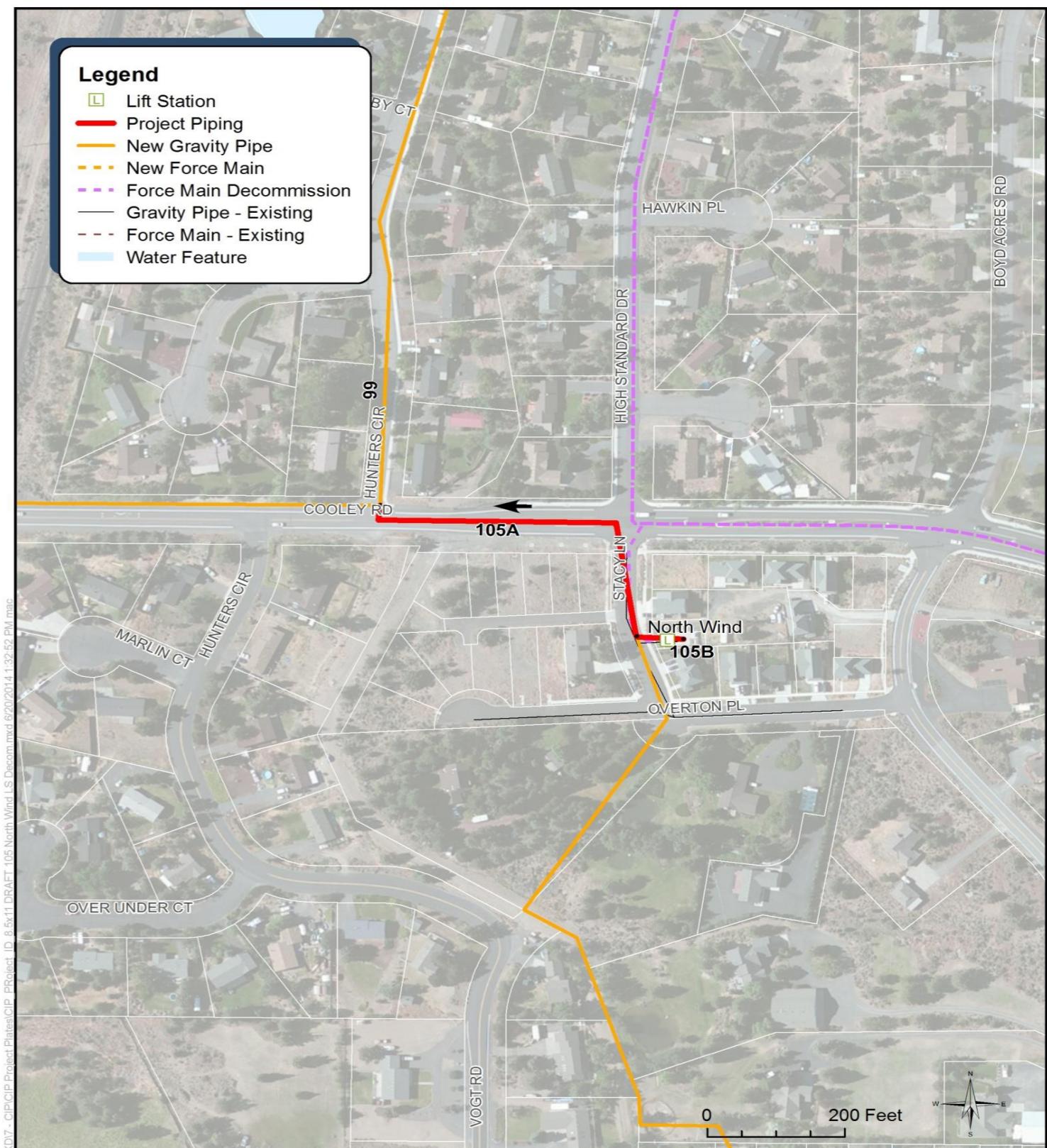
Projects: -

Other Dependent Projects: 100A, 100B

Special Considerations: Cannot be constructed prior to NEI. Coordinate design size, alignment, connection point and invert with final design of NEI.

Project ID	Type of Improvement	Unit	Diameter	From	To
105A	Trenched Gravity Sewer	700 LF	8-inch	North Wind Lift Station	NEI MH
<b>Total Gravity Piping Estimate</b>					<b>\$639,000</b>
105B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$667,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 106A and 106B

Project Name: Phoenix Lift Station Decommission - Gravity Sewer Diversion

From: Phoenix Lift Station

To: CMH007761

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: This improvement allows the contributing area of Phoenix Lift Station to be served by gravity through build-out, increases the reliability of the local system and results in a lower long term life cycle cost compared to a pumped system.

Description: New 8-inch gravity line along Ranch Village Drive from Phoenix Lift Station to Cooley Road, then east along Cooley Road, connecting to existing 8-inch line west of Cooley Road and 18th Street intersection. The decommissioning of Phoenix Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.

Required Preceding Projects: 99, 103A

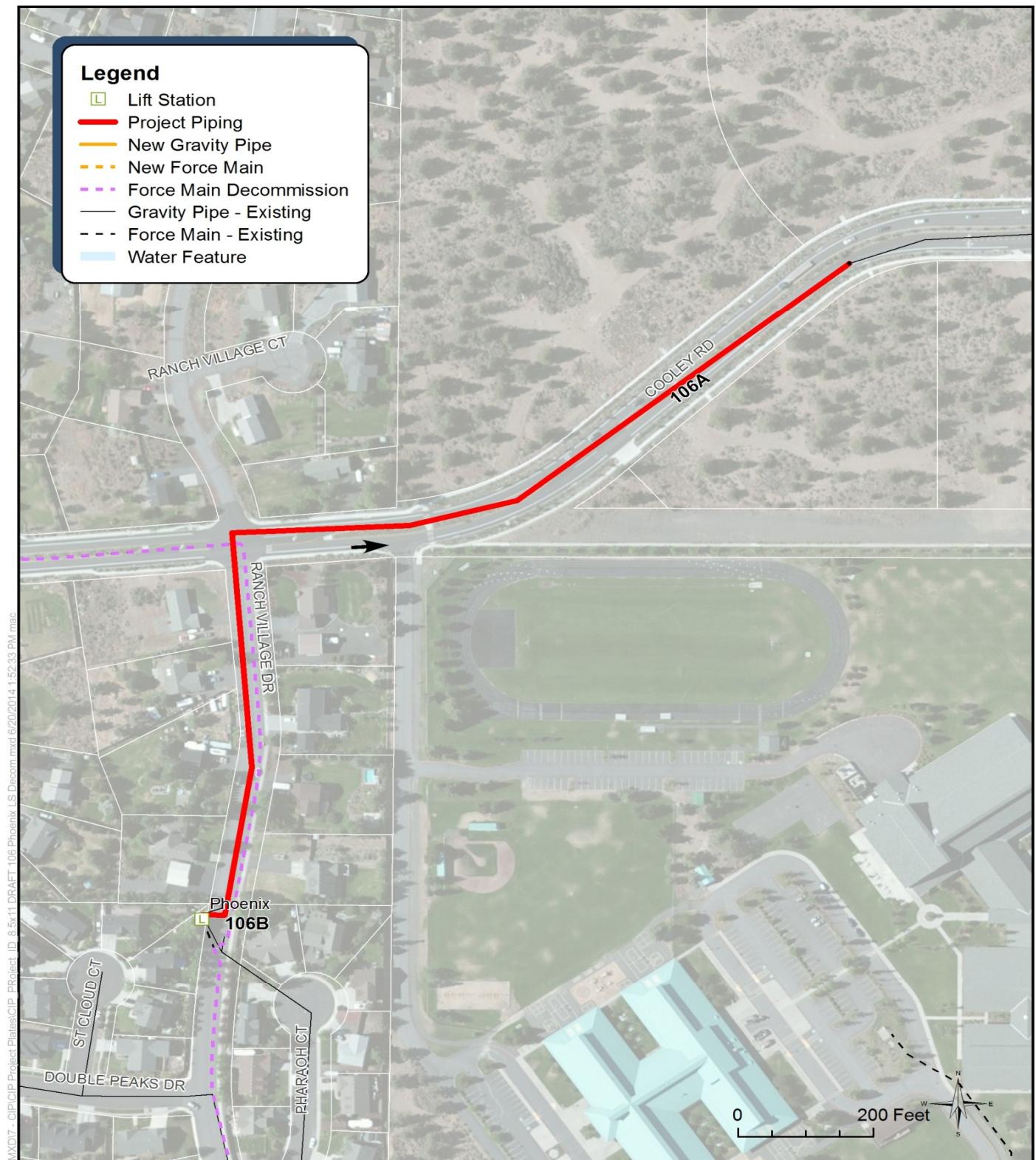
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: Cannot be constructed prior to NEI. Coordinate design size, alignment, connection point and invert with final design of NEI.

Project ID	Type of Improvement	Unit	Diameter	From	To
106A	Trenched Gravity Sewer	1,800 LF	8-inch	Phoenix Lift Station	CMH007761
<b>Total Gravity Piping Estimate</b>					<b>\$599,000</b>
106B	Lift Station Decommission	1 EA	-	-	-
<b>Total Lift Station Decommission Estimate</b>					<b>\$28,000</b>
<b>Total Project Estimate</b>					<b>\$627,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 107

### Parallel Sewer along Butler Market

**Project Name:**

From: CMH002154

To: CMH002167

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: Increase the hydraulic conveyance capacity of the sewer system to accommodate future flows.

Description: Parallel 8-inch gravity line along Butler Market Road between Rumgay Lane and Brinson Boulevard, connecting to existing 8-inch line southwest of Butler Market Road and Tiffany Lane.

Required Preceding Projects: -

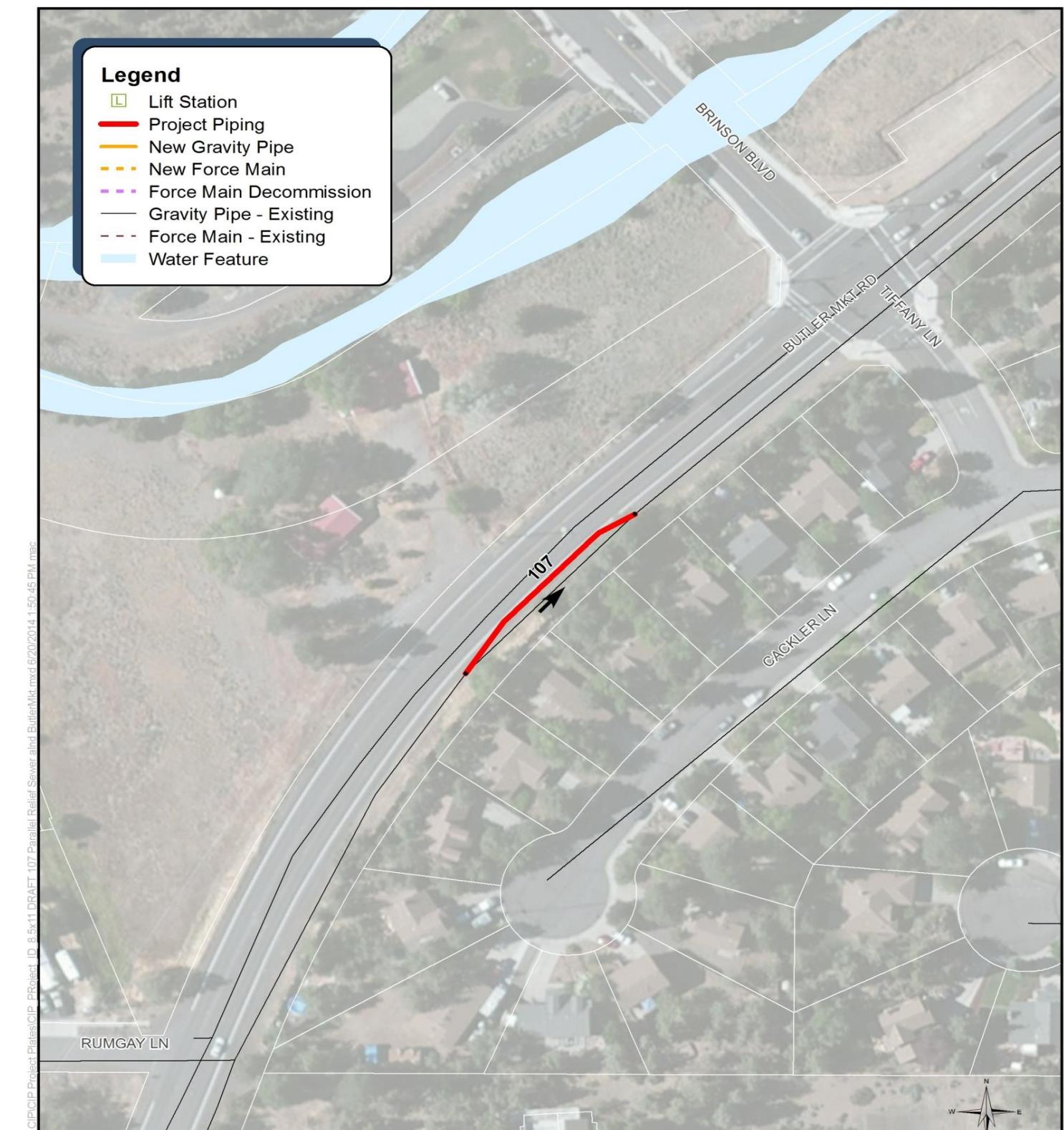
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
107	Trenched Gravity Sewer	200 LF	8-inch	CMH002154	CMH002167
<b>Total Project Estimate</b>					<b>\$47,000</b>

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## Capital Improvement Project



Project ID: 108

Project Name: Parallel Sewer along Purcell Boulevard

From: CMH001372

To: CMH002467

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: Increase the hydraulic conveyance capacity of the sewer system to accommodate future flows.

Description: Parallel 8-inch gravity line along Highway 20 between Dean Swift Road to Purcell Boulevard, then along Purcell Boulevard to Paula Drive, connecting to existing 8-inch line at the intersection.

Required Preceding Projects: -

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
108	Trenched Gravity Sewer	2,200 LF	8-inch	CMH001372	CMH002467
<b>Total Project Estimate</b>					<b>\$555,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 109A

### Parallel Sewer along 4th Street

**Project Name:**

From: CMH009119  
To: CMH009103  
Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: Increase the hydraulic conveyance capacity of the sewer system to accommodate future flows.

Description: Parallel 8-inch gravity line along 4th Street between Emerson Avenue and Franklin Avenue, connecting to existing 8-inch line at Franklin Avenue and 4th Street.

Required Preceding Projects: -

Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
109A	Trenched Gravity Sewer	400 LF	8-inch	CMH009119	CMH009103
<b>Total Project Estimate</b>					<b>\$95,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 109B

Project Name: Parallel Sewer along Alley South of Franklin Avenue

From: CMH009095

To: CMH008162

Project Category: Hydraulic Capacity

Implementation

Timeframe: 11 to 20 year

Objective: Increase the hydraulic conveyance capacity of the sewer system to accommodate future flows.

Description: Parallel 8-inch gravity line between 3rd Street and 4th Street, then along an alley north of Emerson Avenue, connecting to existing 27-inch line south of Franklin Avenue and 2nd Avenue intersection at manhole CMH008162.

Required Preceding Projects: -

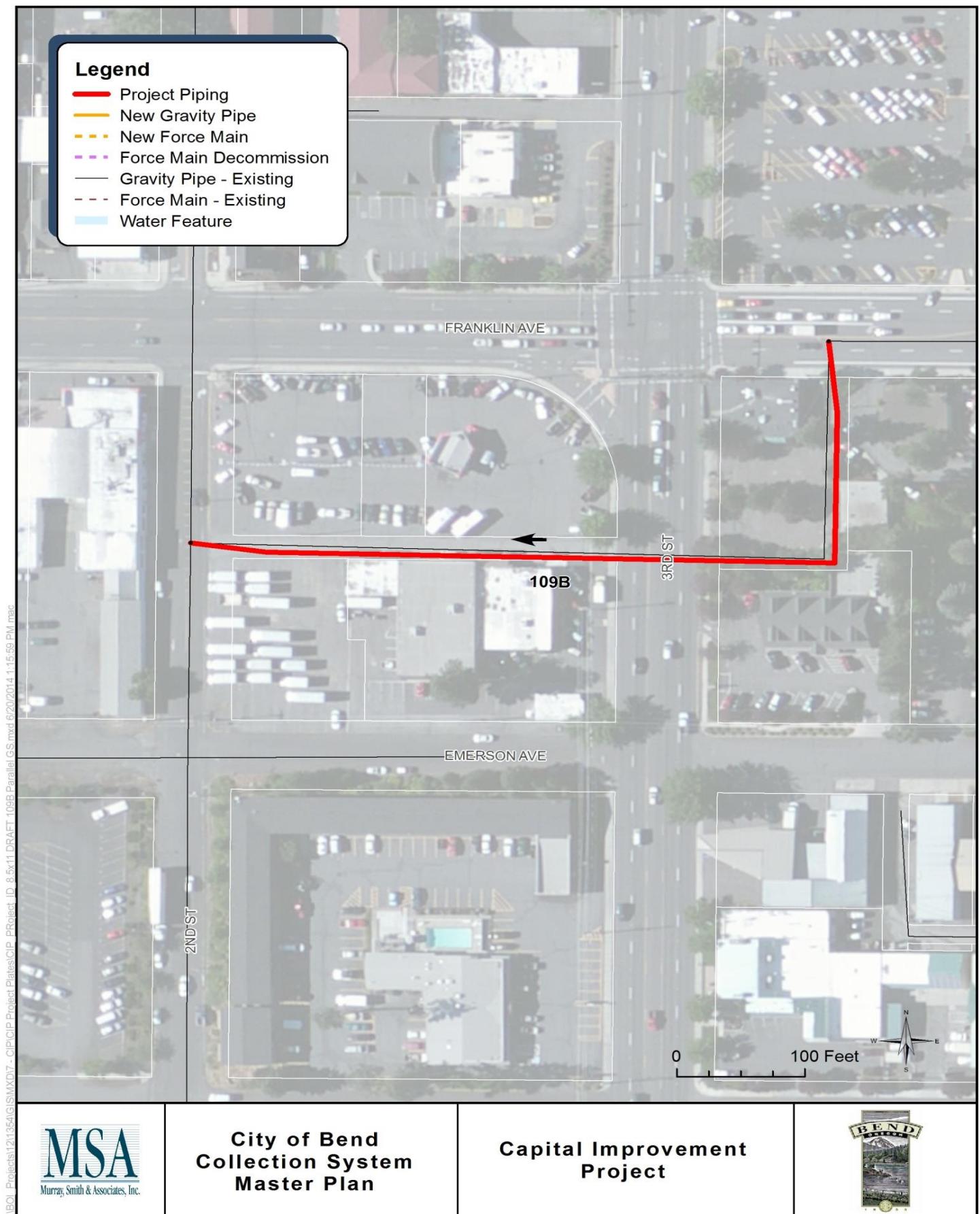
Required Concurrent Projects: -

Other Dependent Projects: -

Special Considerations: The project was sized as a parallel alignment; however during design, the existing piping could be evaluated for replacement with a single larger pipe.

Project ID	Type of Improvement	Unit	Diameter	From	To
109B	Trenched Gravity Sewer	700 LF	8-inch	CMH009095	CMH008162
<b>Total Project Estimate</b>					<b>\$177,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 110

Project Name:	Pheasant Run Lift Station Hydraulic Replacement	
Location:	19840 Hollygrape Street	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	11 to 20 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Replacement of existing facility with a new lift station to accommodate upgrades in capacity. Project includes new pumps, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	
Project ID	Type of Improvement	Required Buildout Capacity
110	Lift Station Replacement	190 gpm
<b>Total Project Estimate</b>	<b>\$553,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 111



Project Name:	Shevlin Commons Lift Station Hydraulic Replacement	
Location:	18984 Squirrel Tail Loop	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	11 to 20 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Replacement of existing facility with a new lift station to accommodate upgrades in capacity. Project includes new pumps, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	
Project ID	Type of Improvement	Required Buildout Capacity
111	Lift Station Replacement	110 gpm
<b>Total Project Estimate</b>	<b>\$726,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 112



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Shevlin Meadows Lift Station Hydraulic Upgrade</b>	
Location:	2980 NW Shevlin Meadow Drive	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	11 to 20 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.	
<b>Project ID</b>	<b>Type of Improvement</b>	<b>Required Buildout Capacity</b>
112	Lift Station Upgrade	170 gpm
<b>Total Project Estimate</b>	<b>\$345,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

**Project ID:** 113

<b>Project Name:</b>	<b>Bachelor Village Lift Station Condition Upgrade</b>
Location:	19723 Mt. Bachelor Court
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.

**Total Project Estimate** **\$345,000**

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 114

Project Name:	Deschutes River Crossing Lift Station Condition Upgrade
Location:	19883 Duck Call Lane
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*

# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 115



**MSA**  
Murray, Smith & Associates, Inc.

Project Name:	<b>Foxborough Lift Station Condition Upgrade</b>
Location:	61308 Sunflower Lane
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*

# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: **116**



<b>Project Name:</b>	<b>Glen Vista Lift Station Condition Upgrade</b>
Location:	20210 Glen Vista Drive
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

*The opinions or estimates of project costs herein were prepared on the basis of available project information, reflecting planning-level preliminary estimates for the year 2013. The project costs are expected to change in the future as new and more detailed information is collected and as the project evolves from planning through construction. Factors beyond the control of MSA that may affect project costs include, but are not limited to, project scope modifications, economic conditions, market conditions, competitive bidding, and variances in the cost of labor, materials and equipment.*

# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 117



Project Name:	<b>Hollow Pines #1 Lift Station Condition Upgrade</b>
Location:	314 SE Springer Court
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 118



<b>Project Name:</b>	<b>Linster Lift Station Condition Upgrade</b>
Location:	267 NW Revere Avenue
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 119



Project Name:	Main Fire Station Lift Station Condition Upgrade
Location:	1212 Simpson Avenue
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 120



**MSA**  
Murray, Smith & Associates, Inc.

Project Name:	<b>N. Fire Station Lift Station Condition Upgrade</b>
Location:	63377 Jamison Street
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$100,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 121



Project Name:	Orion Greens Lift Station Condition Upgrade
Location:	21042 Perrigan Drive
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 122



**MSA**  
Murray, Smith & Associates, Inc.

Project Name:	Pine Ridge Lift Station Condition Upgrade
Location:	61323 Brianne Place
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 123



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	Renaissance Lift Station Hydraulic Upgrade	
Location:	62752 Shevlin Park Road	
Project Category:	Hydraulic Capacity	
Implementation		
Timeframe:	11 to 20 year	
Objective:	Increase hydraulic capacity of the existing lift station to serve build-out conditions (peak wet-weather flow).	
Description:	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements.	
Project ID	Type of Improvement	Required Buildout Capacity
123	Renaissance Lift Station Condition Upgrade	47 gpm
<b>Total Project Estimate</b>	<b>\$345,000</b>	

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# City of Bend Collection System Master Plan

## Capital Improvement Project



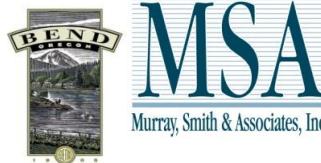
Project ID: 124

Project Name:	Rim Rock Riders Lift Station Condition Upgrade
Location:	20157 NW Roper Lane
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 125

Project Name:	River Canyon #1 Lift Station Condition Upgrade
Location:	19489 Hollygrape Street
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 126



Project Name:	Riviera Lift Station Condition Upgrade
Location:	1562 1st Street
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 127



**MSA**  
Murray, Smith & Associates, Inc.

Project Name:	Service Station Lift Station Condition Upgrade
Location:	63240 Service Road
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.

**Total Project Estimate** \$345,000

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 128



**MSA**  
Murray, Smith & Associates, Inc.

Project Name:	<b>Sunrise #1 Lift Station Condition Upgrade</b>
Location:	19651 Mammoth Drive
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: rail system.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



**MSA**  
Murray, Smith & Associates, Inc.

**Project ID:** 129

<b>Project Name:</b>	<b>Touchmark Lift Station Condition Upgrade</b>
Location:	19855 Touchmark Way
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 130



<b>Project Name:</b>	<b>Tumalo Heights Lift Station Condition Upgrade</b>
Location:	2551 NW 1st Street
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 131



Project Name:	Westside Lift Station Condition Upgrade
Location:	35 Portland Avenue
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition. This lift station is the largest in the system and due to site constraints and size, it will be expensive to upgrade.
<b>Total Project Estimate</b>	<b>\$1,000,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 132



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Woodriver Village Lift Station Condition Upgrade</b>
Location:	20010 Birchwood Drive
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: 133



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Wyndemere Lift Station Condition Upgrade</b>
Location:	745 NW Archie Briggs Road
Project Category:	Improve Condition
Implementation	
Timeframe:	11 to 20 year
Objective:	Rehabilitation and upgrade of lift station components in order to maintain the operational design conditions and avoid further deterioration.
Description:	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.
<b>Total Project Estimate</b>	<b>\$345,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 134



Project Name:	On-Call Hydraulic Modeling Services
Location:	NA
Project Category:	Miscellaneous Project
Implementation:	
Timeframe:	11 to 20 year
Objective:	Maintaining an updated hydraulic model that accurately reflects existing conditions. Utilize the model for analyzing sewer flows and infrastructure needs.
Description:	Engineering services contract for use in maintaining the hydraulic sewer model. This contract will provide funds for a consultant to update the model piping and facilities, review and adjust the calibration, or run specific system analysis to identify required improvements or operational changes. This contract is intended to be utilized on an “as-needed” basis per City staff request. Funding level is \$100,000 per year. City Project ID SW111CA.
<b>Total Project Estimate</b>	<b>\$1,000,000</b>

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# City of Bend Collection System Master Plan Capital Improvement Project

Project ID: 135



Project Name:	Collection System Master Plan Update
Location:	NA
Project Category:	Miscellaneous Project
Implementation	
Timeframe:	11 to 20 year
Objective:	Update the collection system master plan based on recent growth, associated sewer loading and which capital projects have been implemented.
Description:	Engineering services contract to update the current Master Plan, document changes in the system, update the system analysis and CIP. The update will ensure the City is utilizing up-to-date and accurate information regarding the condition of the collection system, flow projections and applicable regulations.
<b>Total Project Estimate</b>	<b>\$1,000,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project



Project ID: 136

Project Name: Large Gravity Main Condition Assessment Program - 11 to 20 year

Location: System Wide

Project Category: Miscellaneous Project

Implementation

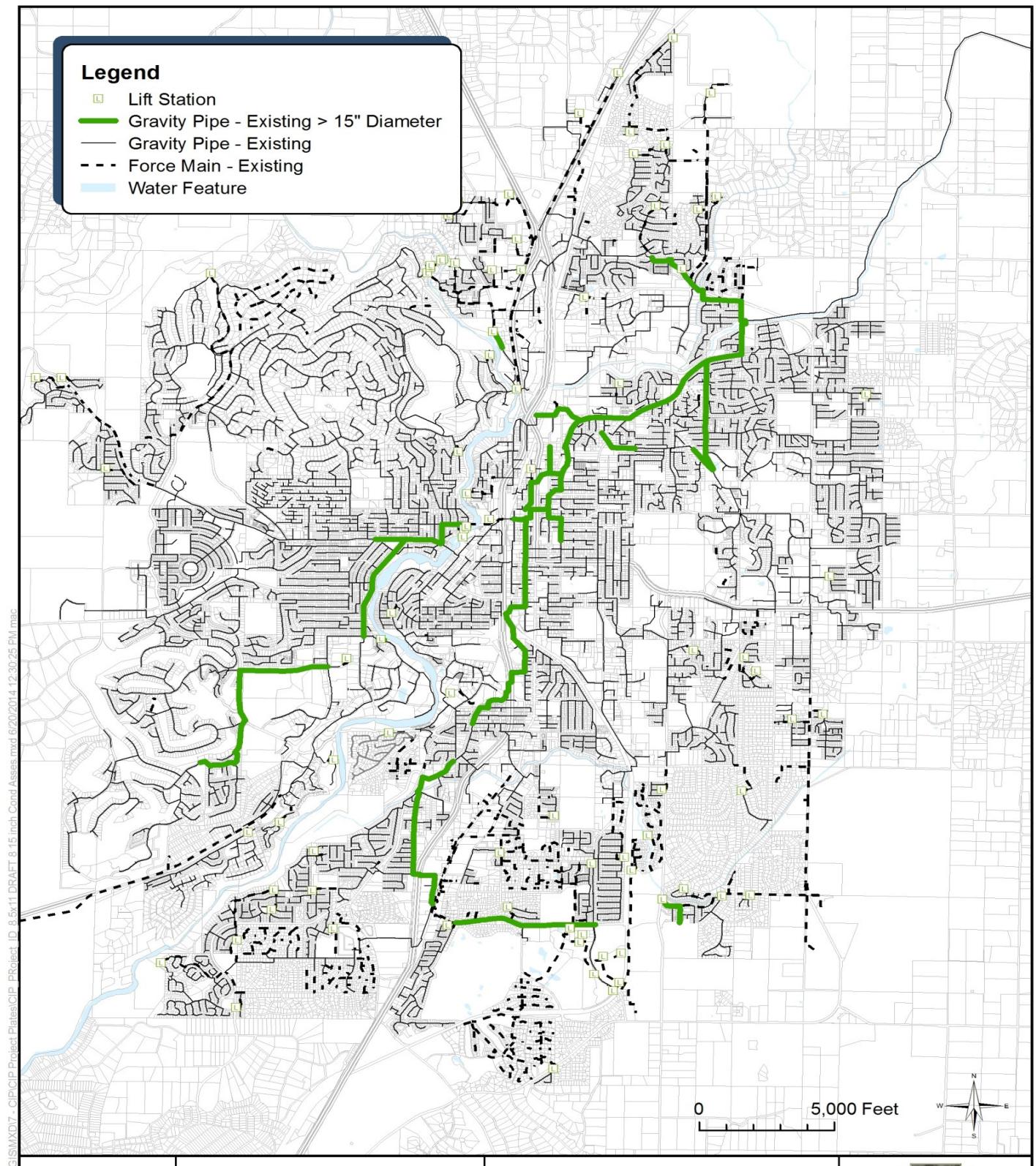
Timeframe: 11 to 20 year

Objective: To evaluate the condition of the existing trunk system, grade system components and recommend repair or replacement where appropriate.

Description: Establish a program to inspect the condition of existing gravity trunk collection system with diameters greater than 15 inches (approximately 4% of the collection system), grade the trunk system components, evaluate rehabilitation options and recommend the most effective solution. This type of inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. This project does not include condition assessment of the Plant Interceptor or Inverted Siphon. Funding level is \$200,000 per year.

**Total Project Estimate** \$2,000,000

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**City of Bend  
Collection System  
Master Plan**

**Capital Improvement  
Project**



# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: **B**



<b>Project Name:</b>	<b>Local Area Improvements</b>
Location:	System Wide
Project Category:	Fund Local Area Improvements
Implementation	
Timeframe:	1 to 5 Year
Objective:	To address currently unsewered areas and areas with historically underperforming sewer systems that will likely need to be improved or replaced in the relatively near future
Description:	Budget to develop a plan for implementing local area sewer improvements in the system. These areas include currently unsewered customers (septic) and areas that have poorly performing systems. Funding level is \$1,000,000 per year. Specific details, including pipe alignments, pipe sizes, service areas, and timetable for construction have not yet been determined.
<b>Total Project Estimate</b>	<b>\$5,000,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: D



Project Name:	Ongoing Repair and Replacement
Location:	System Wide
Project Category:	Fund Ongoing Repair & Replacement
Implementation	
Timeframe:	4 to 5 year
Objective:	To address short-term system condition issues that have not been identified at this time.
Description:	Fund for implementing long term ongoing repair and replacement budget to address condition-related projects in the future. Specific details including alignment, pipe sizes have not been determined at this point.
<b>Total Project Estimate</b>	<b>\$9,680,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: G



<b>Project Name:</b>	<b>Local Area Improvements</b>
Location:	System Wide
Project Category:	Fund Local Area Improvements
Implementation	
Timeframe:	6 to 10 year
Objective:	To address currently unsewered areas and areas with historically underperforming sewer systems that will likely need to be improved or replaced in the relatively near future
Description:	Budget to develop a plan for implementing local area sewer improvements in the system. These areas include currently unsewered customers (septic) and areas that have poorly performing systems. Funding level is \$1,000,000 per year. Specific details, including pipe alignments, pipe sizes, service areas, and timetable for construction have not yet been determined.
<b>Total Project Estimate</b>	<b>\$5,000,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: **H**



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Ongoing Repair and Replacement</b>
Location:	System Wide
Project Category:	Fund Ongoing Repair & Replacement
Implementation	
Timeframe:	11 to 20 year
Objective:	To address long-term system condition issues that have not been identified at this time.
Description:	Fund for implementing long term ongoing repair and replacement budget to address condition-related projects in the future. Specific details including alignment, pipe sizes have not been determined at this point.
<b>Total Project Estimate</b>	<b>\$27,070,000</b>

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# City of Bend Collection System Master Plan

## Capital Improvement Project

Project ID: I



**MSA**  
Murray, Smith & Associates, Inc.

<b>Project Name:</b>	<b>Local Area Improvements</b>
Location:	System Wide
Project Category:	Fund Local Area Improvements
Implementation:	
Timeframe:	11 to 20 year
Objective:	To address currently unsewered areas and areas with historically underperforming sewer systems that will likely need to be improved or replaced in the future
Description:	Budget to develop a plan for implementing local area sewer improvements in the system. These areas include currently unsewered customers (septic) and areas that have poorly performing systems. Funding level is \$1,000,000 per year. Specific details, including pipe alignments, pipe sizes, service areas, and timetable for construction have not yet been determined.
<b>Total Project Estimate</b>	<b>\$10,000,000</b>

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## **APPENDIX 7C**

### **20-Year Lift Station Improvement Plan**

## APPENDIX 7C

### **20-YEAR LIFT STATION IMPROVEMENT PLAN**

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#### **Introduction**

This appendix summarizes the 20-Year Lift Station Improvement Plan for the City of Bend (City) Collection System Master Plan (CSMP), and outlines the projects required for all City-owned, non-residential regional lift stations in the collection system for both near-term and long-term service. This lift station analysis considers hydraulic upgrades, condition improvements and the option to decommission the lift stations. Recommended projects are prioritized for implementation in 1 to 5 years, 6 to 10 years and finally those required in 11 to 20 years.

#### **Lift Station Service Area**

The lift stations in the collection system are typically designed to convey wastewater from areas of lower to higher elevation. For most areas of the City's system, after the sewage is pumped, it can flow by gravity to the Water Reclamation Facility (WRF) with no further pumping (single-pumping requirement). There are areas of the system where sewage must be pumped twice before it reaches the WRF (double-pumping requirement).

#### **20-Year Consolidated Lift Station Plan**

Even though many of the pumping facilities do not have any existing or projected capacity or condition issues, it is assumed that at a minimum, all lift stations will have their mechanical and electrical systems improved within a 20-year timeframe, based on typical useful life of these components. Therefore, all of the City's larger lift stations are included in the identified improvement plan. Many lift stations will be decommissioned as the Southeast Interceptor and Northeast Interceptor are constructed.

#### ***Hydraulics***

As presented in Table 4-1 of Section 4—System Analysis, a lift station must have the capacity to discharge the flow associated with the peak wet weather flow event with the largest pump out of service. Each of the area and regional lift stations in the system were assessed for hydraulic deficiencies.

Due to the hydraulic complexity of the common pressure mains in the collection system where multiple lift stations discharge into one force main, an in-depth assessment of each lift station and common pressure main system was completed, and is detailed in Section 4 and Appendix 4C—Lift Station Duty Point Analysis. The assessment was completed for the existing, 10- and 20-year wastewater flow rates and evaluated using the existing and proposed CSMP force main configurations. The existing configuration analyzed the piping currently utilized for all lift stations pumping into force mains and common pressure mains.

The proposed CSMP force main configurations analyzed deficiencies for modified force main and common pressure mains. The analysis accounted for the changes that would occur as the CIP is implemented related to changes in piping and as lift stations are decommissioned.

The results of the lift station hydraulic analysis are presented in Section 4 and Appendix 4C. Recommendations resulting from lift station hydraulic assessment are presented according to the following timeframe categories:

- Requires upgrade/replacement immediately
- Requires upgrade/replacement in the 1- to 5-year timeframe
- Requires upgrade/replacement in the 6- to 10-year timeframe
- Requires upgrade/replacement in the 11- to 20-year timeframe
- Does not require upgrade/replacement in the 20-year planning horizon

### ***Condition***

The City's Operations & Maintenance (O&M) Department rated the City-owned lift stations in the collection system (summarized in Section 4). The lift station condition assessment included the following timeframe categories:

- Requires significant improvements immediately, included in the 1- to 5-year timeframe
- Requires significant improvements within 5 years, included in the 1- to 5-year timeframe
- Requires significant improvements within 10 years, included in the 6- to 10-year timeframe
- In good condition, requiring no major improvements within 10 years (included in the 11- to 20-year CIP)

### ***Decommission***

As identified in Section 6—Optimization, the optimization analysis evaluated alternatives to decommission existing lift stations where gravity sewer diversion alternatives were considered viable. Where life-cycle costs analysis favors decommissioning a lift station, the CIP lists that lift station as having been removed from operation. Costs associated with decommissioning a lift station include the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place. The installation of new gravity piping enabling the decommissioning of a lift station is also identified in the CIP.

## ***Consolidated Lift Station Plan***

The results of the hydraulic analysis, condition analysis and decommissioning analysis were incorporated to create this 20-Year Consolidated Lift Station Plan. Due to the various drivers and timeframes for the potential improvements, lift stations may have one or two projects occurring within the 20-year timeframe.

In general, decommissioning projects take precedence over hydraulic improvement or condition-related improvements when occurring at the same time or earlier. However, this is not the case when the option to decommission occurs later than hydraulic improvement or condition-related improvement requirements.

In this case, the lift station will have two projects: either a hydraulic or a condition-related improvement project followed by a decommissioning project. If a condition improvement project was identified to occur prior to a hydraulic upgrade/replacement project, both will be implemented concurrently.

The lift station improvement projects and project combinations are described below:

- Hydraulic - The lift station will receive an upgrade/replacement to increase the pumping capacity to the required capacity.
- Condition - The lift station will receive a condition improvement to correct condition issues at the lift station.
- Decommission - The decommissioning of a lift station includes the removal of the existing lift station facility when the construction of a new gravity diversion makes the lift station obsolete.
- Hydraulic and Condition projects occurring at the same horizon - Hydraulic and condition deficiencies occur at the same time. The lift station will receive an upgrade/replacement to increase the pumping capacity to the required capacity, and other improvements will be made as needed to correct condition issues at the lift station.
- Condition-related project horizon occurring prior to Hydraulic project horizon - When a condition-related improvement is needed prior to a hydraulic improvement project, the hydraulic improvement will be completed earlier than required to minimize the number of projects and streamline the overall effort. The proposed lift station project will correct condition-related issues and increase the pumping capacity to the required capacity.
- Condition-related project prior to Decommission project - In this case, the lift station will receive a condition improvement and subsequently the lift station will be decommissioned (in general at least 5 years after the condition improvement).
- Hydraulic project prior to Decommission project - In this case, the lift station will receive an upgrade or replacement to increase the pumping capacity to the required capacity and subsequently the lift station will be decommissioned (in general at least 5 years after the upgrade or replacement).

The overall 20-Year Lift Station Improvement Plan assumes mechanical and electrical systems have a service life of 20 years; therefore, at a minimum, all the City's lift stations include condition-based upgrades within the 20-year timeframe. All costs identified in this section reference 2013 dollars.

**Table 7C-1**  
**20-Year Lift Station Plan Summary**

Lift Station	Force Main	Modeled	Improvement Horizon			20 Year Plan		
			Decommission	Condition	Hydraulic	Horizon	Improvement	Cost of Improvement
Aspen Ridge <sup>1</sup>	Common	Modeled	NA	11 to 20 years	6 to 10 years	6 to 10 years	Hydraulic	\$1,042,000
Awbrey Glen	Dedicated	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$139,000
Bachelor Village	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Blue Ridge	Common	Modeled	11 to 20 years	11 to 20 years	Beyond 20 years	11 to 20 years	Decommission	\$28,000
Boyd Acres	Dedicated	Modeled	11 to 20 years	11 to 20 years	1 to 5 years	1 to 5 years	Hydraulic	\$345,000
						11 to 20 years	Decommission	\$28,000
Camden Park	Common	Modeled	6 to 10 years	1 to 5 years	6 to 10 years	1 to 5 years	Condition	\$150,000
						6 to 10 years	Decommission	\$28,000
Canal View	Common	Modeled	NA	1 to 5 years	Existing	1 to 5 years	Hydraulic	\$150,000
Crown Villa #1	Common	Not Modeled	1 to 5 years	Immediate	Not Modeled	1 to 5 years	Condition	\$100,000
						1 to 5 years	Decommission	\$28,000
Crown Villa #2	Common	Not Modeled	1 to 5 years	Immediate	Not Modeled	1 to 5 years	Condition	\$100,000
						1 to 5 years	Decommission	\$28,000
Darnell Estates	Common	Modeled	11 to 20 year	11 to 20 years	11 to 20 years	11 to 20 years	Decommission	\$28,000
Deschutes Business	Common	Modeled	NA	Immediate	Beyond 20 years	1 to 5 years	Condition	\$345,000
Deschutes River Crossing	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Desert Skies	Common	Modeled	6 to 10 years	11 to 20 years	6 to 10 years	6 to 10 years	Decommission	\$28,000
Drake <sup>1</sup>	Dedicated	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$1,853,000
Empire Estates	Common	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Empire	Dedicated	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$100,000
Empire Village	Dedicated	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$100,000
Enchant on Deschutes	Common	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Forum	Dedicated	Modeled	6 to 10 years	6 to 10 years	Beyond 20 years	6 to 10 years	Decommission	\$28,000
Foxborough	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Glen Vista	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Glenshire	Dedicated	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Highland	Common	Modeled	11 to 20 v	11 to 20 years	11 to 20 years	11 to 20 years	Decommission	\$28,000
Holiday Inn	Common	Modeled	11 to 20 years	11 to 20 years	Beyond 20 years	11 to 20 years	Decommission	\$28,000
Hollow Pines #1	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Hollow Pines #2	Common	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Juniper Ridge	Common	Modeled	11 to 20 years	11 to 20 years	11 to 20 years	11 to 20 years	Decommission	\$28,000
Linster	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Main Fire Station	Dedicated	Not Modeled	NA	11 to 20 years	Not Modeled	11 to 20 years	Condition	\$100,000
Majestic	Dedicated	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Murphy	Common	Modeled	1 to 5 years	11 to 20 years	1 to 5 years	1 to 5 years	Decommission	\$28,000

Lift Station	Force Main	Modeled	Improvement Horizon			20 Year Plan		
			Decommission	Condition	Hydraulic	Horizon	Improvement	Cost of Improvement
North Fire Station	Dedicated	Not Modeled	NA	11 to 20 years	Not Modeled	11 to 20 years	Condition	\$100,000
North Pointe	Common	Modeled	11 to 20 years	11 to 20 years	11 to 20 years	11 to 20 years	Decommission	\$28,000
North Wind	Common	Modeled	11 to 20 years	11 to 20 years	11 to 20 years	11 to 20 years	Decommission	\$28,000
Nottingham #1	Common	Not Modeled	6 to 10 years	Immediate	Not Modeled	1 to 5 years	Condition	\$150,000
						6 to 10 years	Decommission	\$28,000
Nottingham #2	Common	Not Modeled	6 to 10 years	Immediate	Not Modeled	1 to 5 years	Condition	\$150,000
						6 to 10 years	Decommission	\$28,000
Old Mill	Dedicated	Modeled	NA	11 to 20 years	6 to 10 years	6 to 10 years	Hydraulic	\$345,000
Orion Greens	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Pacific	Dedicated	Not Modeled	NA	Immediate	Not Modeled	1 to 5 years	Condition	\$345,000
Pheasant Run <sup>1</sup>	Common	Modeled	NA	11 to 20 years	11 to 20 years	11 to 20 years	Hydraulic, Condition	\$553,000
Phoenix	Common	Modeled	11 to 20 v	11 to 20 years	11 to 20 years	11 to 20 years	Decommission	\$28,000
Pine Ridge	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Pioneer	Dedicated	Modeled	NA	Immediate	Beyond 20 years	1 to 5 years	Condition	\$345,000
Poplar Park	Common	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$100,000
Quail Crossing <sup>1</sup>	Common	Modeled	NA	11 to 20 years	6 to 10 years	6 to 10 years	Hydraulic	\$559,000
Quail Ridge #1	Common	Not Modeled	11 to 20 years	Immediate	Not Modeled	1 to 5 years	Condition	\$150,000
						11 to 20 years	Decommission	\$28,000
Quail Ridge #2	Common	Not Modeled	1 to 5 years	Immediate	Not Modeled	1 to 5 years	Condition	\$150,000
						1 to 5 years	Decommission	\$28,000
Renaissance	Common	Modeled	NA	11 to 20 years	11 to 20 years	11 to 20 years	Hydraulic, Condition	\$345,000
Renwick	Dedicated	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$345,000
Ridgewater #1	Common	Modeled	1 to 5 years	11 to 20 years	6 to 10 years	1 to 5 years	Decommission	\$28,000
Ridgewater #2	Common	Modeled	6 to 10 years	11 to 20 years	6 to 10 years	6 to 10 years	Decommission	\$28,000
Rimrock #1	Common	Not Modeled	NA	1 to 5 years	Not Modeled	1 to 5 years	Condition	\$100,000
Rimrock #2	Common	Not Modeled	NA	1 to 5 years	Not Modeled	1 to 5 years	Condition	\$100,000
Rimrock #4	Common	Not Modeled	NA	1 to 5 years	Not Modeled	1 to 5 years	Condition	\$100,000
Rimrock #5	Common	Not Modeled	NA	1 to 5 years	Not Modeled	1 to 5 years	Condition	\$100,000
Rim Rock Riders	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
River Canyon #1	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
River Canyon #2	Common	Modeled	NA	11 to 20 years	Existing	1 to 5 years	Hydraulic	\$345,000
River Rim <sup>1</sup>	Common	Modeled	NA	11 to 20 years	Existing	1 to 5 years	Hydraulic	\$1,558,000
Riverhouse <sup>2</sup>	Common	Modeled	NA	1 to 5 years	1 to 5 years	1 to 5 years	Hydraulic, Condition	\$345,000
Rivers Edge	Dedicated	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Riviera	Dedicated	Not Modeled	NA	11 to 20 years	Not Modeled	11 to 20 years	Condition	\$345,000
Sawyer Park	Common	Modeled	NA	6 to 10 years	11 to 20 years	6 to 10 years	Condition, Hydraulic	\$345,000
Service	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Shadow Glen	Common	Modeled	6 to 10 years	11 to 20 years	6 to 10 years	6 to 10 years	Decommission	\$28,000
Shevlin <sup>3</sup>	Dedicated	Modeled	1 to 5 years	Immediate	Existing	1 to 5 years	Decommission	\$28,000

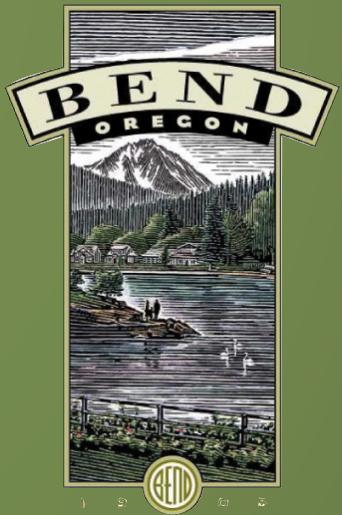
Lift Station	Force Main	Modeled	Improvement Horizon			20 Year Plan		
			Decommission	Condition	Hydraulic	Horizon	Improvement	Cost of Improvement
Shevlin Commons <sup>1</sup>	Common	Modeled	NA	11 to 20 years	11 to 20 years	11 to 20 years	Hydraulic, Condition	\$726,000
Shevlin Meadows	Common	Modeled	NA	11 to 20 years	11 to 20 years	11 to 20 years	Hydraulic, Condition	\$345,000
Simplicity	Dedicated	Modeled	11 to 20 years	11 to 20 years	Beyond 20 years	11 to 20 years	Decommission	\$28,000
South Village	Common	Modeled	6 to 10 years	11 to 20 years	6 to 10 years	6 to 10 years	Decommission	\$28,000
Stone Haven	Dedicated	Modeled	11 to 20 years	11 to 20 years	Beyond 20 years	11 to 20 years	Decommission	\$28,000
Summit Park	Dedicated	Modeled	11 to 20 years	11 to 20 years	Beyond 20 years	11 to 20 years	Decommission	\$28,000
Sun Meadow	Common	Modeled	1 to 5 years	11 to 20 years	6 to 10 years	1 to 5 years	Decommission	\$28,000
Sunrise #1	Common	Not Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
The Pines #5	Common	Not Modeled	11 to 20 years	1 to 5 v	Not Modeled	1 to 5 years	Condition	\$100,000
						11 to 20 years	Decommission	\$28,000
The Pines #6	Common	Not Modeled	11 to 20 years	1 to 5 years	Not Modeled	1 to 5 years	Condition	\$100,000
						11 to 20 years	Decommission	\$28,000
The Pines #7	Common	Not Modeled	11 to 20 years	1 to 5 years	Not Modeled	1 to 5 years	Condition	\$100,000
						11 to 20 years	Decommission	\$28,000
The Shire	Dedicated	Modeled	11 to 20 years	11 to 20 years	Beyond 20 years	11 to 20 years	Decommission	\$28,000
Touchmark	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Tri Peaks	Dedicated	Modeled	1 to 5 years	11 to 20 years	1 to 5 years	1 to 5 years	Decommission	\$28,000
Tumalo Heights	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000
Underwood	Dedicated	Modeled	NA	1 to 5 years	Beyond 20 years	1 to 5 years	Condition	\$345,000
Westside <sup>4</sup>	Dedicated	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$1,000,000
Widgi Creek	Common	Modeled	NA	6 to 10 years	Beyond 20 years	6 to 10 years	Condition	\$345,000
Woodriver Village	Dedicated	Not Modeled	NA	11 to 20 years	Not Modeled	11 to 20 years	Condition	\$345,000
Wyndemere	Common	Modeled	NA	11 to 20 years	Beyond 20 years	11 to 20 years	Condition	\$345,000

<sup>1</sup> Lift station is a replacement rather than upgrade/improvement due to combination of design of existing lift station, condition of lift station, and required capacity.

<sup>2</sup> Riverhouse Lift Station is not hydraulically deficient after the planned common pressure main system modifications. However, it is severely oversized and project to decrease the capacity is recommended ion the 1- to 5-year horizon.

<sup>3</sup> While Shevlin Lift Station does not appear to be deficient hydraulically, flows from Deschutes Brewery are released over a short period of time and result in a deficiency which is only mitigated by wet well storage. The lift station is considered an existing deficiency for the CIP.

<sup>4</sup> This lift station is the largest in the system and due to site constraints and size, it will be expensive to upgrade.



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