STUDY AREA 7

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INTRODUCTION

The City of Bend is the provider of wastewater collection and treatment service within the City of Bend Urban Growth Boundary (UGB). The 2006 Collection System Master Plan was developed in cooperation with the City of Bend Public Works Department to provide the roadmap for the providing service to all existing users, existing developed areas that have not yet connected to the system and for new development.. This includes areas outside of the UGB but within the Urban Area Reserve (UAR). The key principles that the plan was based on were:

- Protect the public health and maintain the quality of the water environment within and around the City of Bend:
- Provide ongoing system capacity and reliability to minimize the risk of Sanitary Sewer Overflows (SSOs);
- Provide planning based on approved General Plan;
- Provide infrastructure capacity for existing developed areas that currently are not provided with sanitary service;
- Provide gravity-based collection system, reducing operational risk and long term life-cycle operations costs for the City wastewater collection system; and
- Develop a long-term plan for sanitary service within the existing UGB and UAR service areas.

The results and recommendations of the Master Plan are summarized in the 2006 Collection System Master Plan Report. In addition to the Master Plan Report, nine Study Area Plans were developed to provide a detailed summary of the plans for providing sanitary service to each parcel. These plans consist of three components:

1. Projects for Unserved Areas (local gravity sewers needed to provide service to currently-developed parcels that do not have City sewer service);
2. Pump Stations (recommendations on the long-term operation of each pump station); and
3. System Deficiencies (the correction of current and long-term system capacity deficiencies).

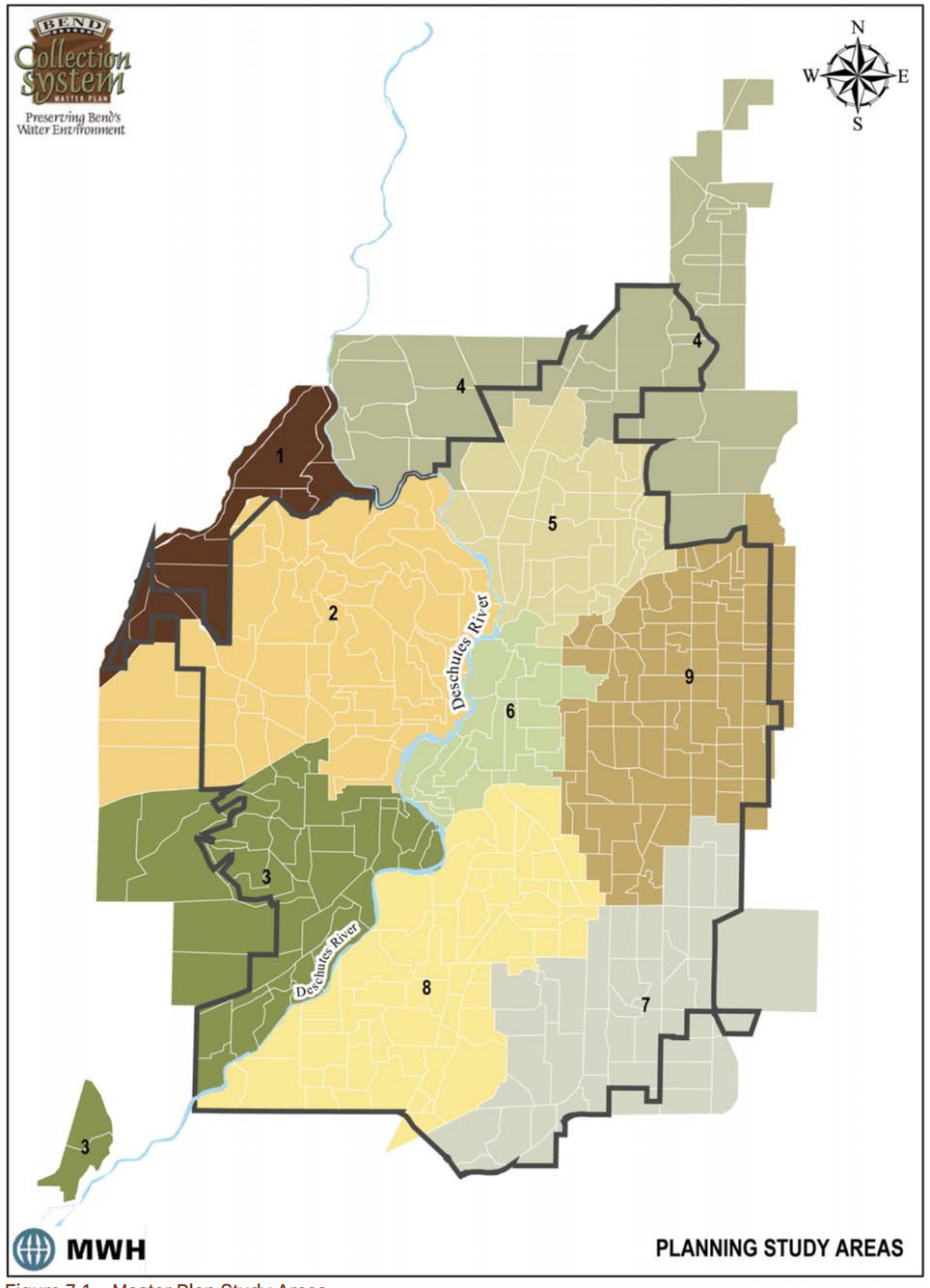


Figure 7-1 – Master Plan Study Areas

STUDY AREA 7

The planning area, which includes both the areas of the UGB and the UAR, is shown in ***Figure 7-1 – Master Plan Study Areas***. To organize and simplify the presentation of the information developed in the Master Plan, the planning area has been divided into nine Study Areas. This document provides the information for Study Area 7 which is the southeastern portion of the City located on the east side of the Deschutes River. This area is highlighted and labeled in ***Figure 7-1***.

Study Area 7 consists of 3.941 acres (3,439 parcels), which can be subdivided into four categories Below is a summary of each category**:**

1. 950 acres (1,484 parcels) that receive sewer service;
2. 938 acres (1,475 parcels) that are developed but do not receive City sewer service (using a septic system or other type of wastewater service);
3. 898 acres (480 parcels) are undeveloped but are buildable within the UGB; and
4. 1,155 acres that are outside UGB but within the UAR. For this Master Plan the UAR lands were considered to be 70% developable.

EXISTING SEWERS

Study Area 7 currently has 10.82-miles of gravity sewers ranging in size from 6-inches in diameter to 8-inches in diameter. A summary of the total length of gravity sewer by line size is summarized in ***Table 7-1***. All 10.82-miles of these gravity sewers are serving local neighborhoods.

Table 7-1
Study Area 7
Gravity Sewer Statistics

Line Diameter (inches)	Length		Percent of Total
	Feet	Miles	
6	156	0.03	0.27
8	56,952	10.79	99.73

Note: Data summary as of May 2005

PROJECTS FOR UNSERVED AREAS

There are many areas within Study Area 7 with no sanitary service. For each of these areas, a project has been defined so that every parcel within Study Area 7 can be served. An emphasis was placed on providing service through a gravity system, unless it was either not technically feasible or cost prohibitive.

CRITERIA FOR LATERAL SEWERS

Determination of the feasibility of gravity sewer laterals to service currently unsewered areas in the Bend system depends on several factors. These include:

- The depth of the existing connection manhole or cleanout;
- The distance from the connecting manhole to the most distant property parcel to be served;
- The average slope of the terrain between the parcel to be served and the connecting manhole;
- Diameter adequate for estimated flows;
- Minimum grades used for gravity sewers (i.e. – 8” @ 0.004 ft/ft, 12” @ 0.0028 ft/ft, etc) to allow a minimum velocity of 2 ft/sec;
- The depth of gravity sewer designs will not be driven by the existence or potential existence of basements in structures;

- Gravity sewer service is possible when the finished floor of the structure to be serviced is at least 3 feet above the invert of the main in the street; and
- Surface features or conflicting utilities that would prevent the installation of gravity sewers were not evaluated.

The existing topography within the UGB is limited to 2-foot contours. The inverts for existing manhole or cleanouts were not always available; therefore some assumptions were made regarding the feasibility of extending gravity sewers to the unsewered parcels. The proposed sanitary sewer layouts for projects to provide service to the unsewered areas within the UGB were developed within the guidelines and limitations of the available information. Confirming field work to ascertain the elevation difference between the connecting manhole and the parcel(s) to be served, along with confirmation of the connecting manhole depth, must be done prior to design of these proposed projects.

SANITARY SEWER PROJECT DEVELOPMENT

The master plan for providing gravity sewers to this area is dependent on the construction of the SE Interceptor. The SE Interceptor will allow for the decommissioning of the Murphy Road Regional Pump Station as well as provide the required capacity to serve this area in both the near and long-term. Without the construction of the SE Interceptor, additional sanitary service to this area is extremely limited.

The sanitary sewer projects are shown in ***Figure 7-2 – Study Area 5 Proposed Sanitary Sewer Layout***. Each project has been given a Project ID. The Project ID is based on the number format of X-Y. This number is based on the following codes:

- X – Study Area Number
- Y – Project Number within the Study Area

This Project ID system will be used to identify each of these projects during system development. Each project has been summarized in ***Table 7-2***. A more detailed figure of the study area proposed projects with the 2-foot topography overlay is provided in the ***Appendix***.

Table 7-2
Study Area 7 New Sewer Systems
Capital Project Cost Estimates Study

Project ID	Length (feeta0	Diameter (inches)	Notes
7.01	16,895	8	Provides sewers to unsewered area
7.02	19,145	8	Provides sewers to unsewered area
7.03	12,785	8	Provides sewers to unsewered area
7.04	2,251	8	Provides sewers to unsewered area
7.05	603	8	Provides sewers to unsewered area
7.06	310	8	Provides sewers to unsewered area
7.07	454	8	Provides sewers to unsewered area
7.08	5,470	8	Provides sewers to unsewered area
7.09	775	8	Provides sewers to unsewered area
7.10	1,134	8	Provides sewers to unsewered area
7.11	3,166	8	Provides sewers to unsewered area
7.12	500	8	Provides sewers to unsewered area
7.13	212	8	Provides sewers to unsewered area
7.14	450	8	Provides sewers to unsewered area
7.15	478	8	Provides sewers to unsewered area
7.16	4,742	8	Provides sewers to unsewered area
7.17	657	8	Provides sewers to unsewered area
7.18	5,429	8	Provides sewers to unsewered area
7.19	2,017	8	Provides sewers to unsewered area
7.20	1,693	8	Provides sewers to unsewered area
7.21	4,025	8	Provides sewers to unsewered area
7.22	2,696	8	Provides sewers to unsewered area
7.23	1,035	8	Provides sewers to unsewered area
7.24	1,993	8	Provides sewers to unsewered area
7.25	781	8	Provides sewers to unsewered area
7.26	201	8	Provides sewers to unsewered area
7.27	19,453	8	Provides sewers to unsewered area
7.28	4,240	8	Provides sewers to unsewered area
7.29	710	8	Provides sewers to unsewered area
7.30	274	8	Provides sewers to unsewered area
7.31	4,808	8	Provides sewers to unsewered area
7.32	2,973	8	Provides sewers to unsewered area
7.33	2,968	8	Provides sewers to unsewered area
7.34	321	8	Provides sewers to unsewered area
7.35	1,694	8	Provides sewers to unsewered area Flows to School Pump Station
7.36	2,460	8	Provides sewers to unsewered area Flows to School Pump Station
7.37	6,436	8	Provides sewers to unsewered area Flows to School Pump area

Table 7-2(Contd..)
Study Area 7 New Sewer Systems
Capital Project Cost Estimates Study

7.38	5,662	8	Provides sewers to unsewered area Serves eastern portions of Section 11
7.39	1,408	8	Provides sewers to unsewered area Serves northwestern section of Section 11

PUMP STATIONS

Study Area 7 currently has 23 pump stations. Detailed pump station analysis is available in TM 3.8; this section summarizes the process and results. The service area for each of these pump stations is shown in ***Figure 7-3***. A list of the pump stations is shown in ***Table 7-3***. *Table 7-3* also identifies which pumps were included in the model. The capacity for each pump station was evaluated to determine if the existing station has adequate capacity for future growth conditions. For stations that were modeled, the dynamic peak flow determined by the InfoSWMM model was used as the peak flow. For stations that were not modeled, first the current and future service area for each station was determined. Next, the number of dwelling units and base flow for each service area was determined based on the land area and zoning based on the criteria outlined in TM 3.1 – Planning Criteria. Finally, the peak flow was calculated by applying peaking factors and an RDII flow of 150 gallons/acre/day. The following terms and peaking factors were used in the evaluation of each pump station that supports *Table 7-3*:

- Modeled – Yes means that pump station is included in the INFOSWMM hydraulic model. No means it has not been included in the model.
- Firm Capacity – The firm capacity is the capacity of the station with one pump out of service to act as a redundant pump. This is a regulatory requirement.
- Base Flow –winter season flow based on area zoning.
- RDII Flow –flow due to inflow into the system during heavy rainfall.
- Peak Flow – The peak hour flow for non-modeled pumps was estimated as the base flow multiplied by a diurnal peaking factor of 1.8 and the seasonal peaking factor of 1.25 to which the RDII flow was added.

The application of this criteria determined if the pump station will meet the build-out flow of its respective service area or not. For stations where the installed capacity will not serve the build-out flows, the time at which the stations will reach capacity was not part of this evaluation. This must be determined by the respective growth rate in each pump station's service area. The respective service area data for the estimated growth rates were not available for this evaluation.

Blue Ridge

The Blue Ridge Pump Station serves an area of 38 acres. This station service area is currently 62% sewered serving 68 of the 110 potential build-out dwelling units. The current (2005) estimated base flow for this station is 9-gpm with a peak hour flow of 28-gpm. The build-out estimated base flow for this station is 14-gpm with a peak flow of 39-gpm. The force main for this pump station is a 3-inch line. The design velocity in this force main under firm pumping conditions is 3.2-fps. The existing station capacity of 70-gpm will meet the long-term requirements of the service area.

Table 7-3
Study Area 7 Pump Stations
Existing Installed Information

Pump Station Name	Modeled	Number Of Pumps	Firm Capacity (gpm)	Force Main	
				Diameter (in)	Length (ft)
Blue Ridge	N	2	70	3	-
Camden	Y	2	125	4	38
Crown Villa RV #1	N	2	80	Note 1	Note 1
Crown Villa RV #2	N	2	80	Note 1	Note 1
Darnell Estates	Y	2	170	4	528
Desert Skies	Y	2	95	4	649
Foxborough	Y	2	260	6	2837
Nottingham #1	N	2	76	4	Note 1
Nottingham #2	N	2	55	4	Note 1
Quail Ridge #1	N	2	100	-	Note 1
Quail Ridge #2	N	2	100	-	Note 1
Ridgewater #1	Y	2	125	4	5489
Ridgewater #2	Y	2	118	4	3709
South Fire Station	N	2	65	2	Note 1
Stonehaven	N	2	250	4	Note 1
Sun Meadows	N	2	380	6	Note 1
The Pines #1	N	2	60	4	Note 1
The Pines #2	N	2	60	4	Note 1
The Pines #3	N	2	60	4	Note 1
The Pines #4	N	2	60	4	Note 1
The Pines #5	N	2	60	4	Note 1
The Pines #6	N	2	60	4	Note 1
The Pines #7	N	2	60	4	Note 1

Note 1: This system was part of the original Juniper Ridge Utilities System. No service area analysis was performed due to the lack of required data.
Note 2: Nottingham #2 receives flow from Nottingham #1.

Camden

The Camden Pump Station serves an area of 72 acres. This station service area is currently 29% sewered serving 63 of the 214 potential build-out dwelling units. The current (2005) estimated base flow for this

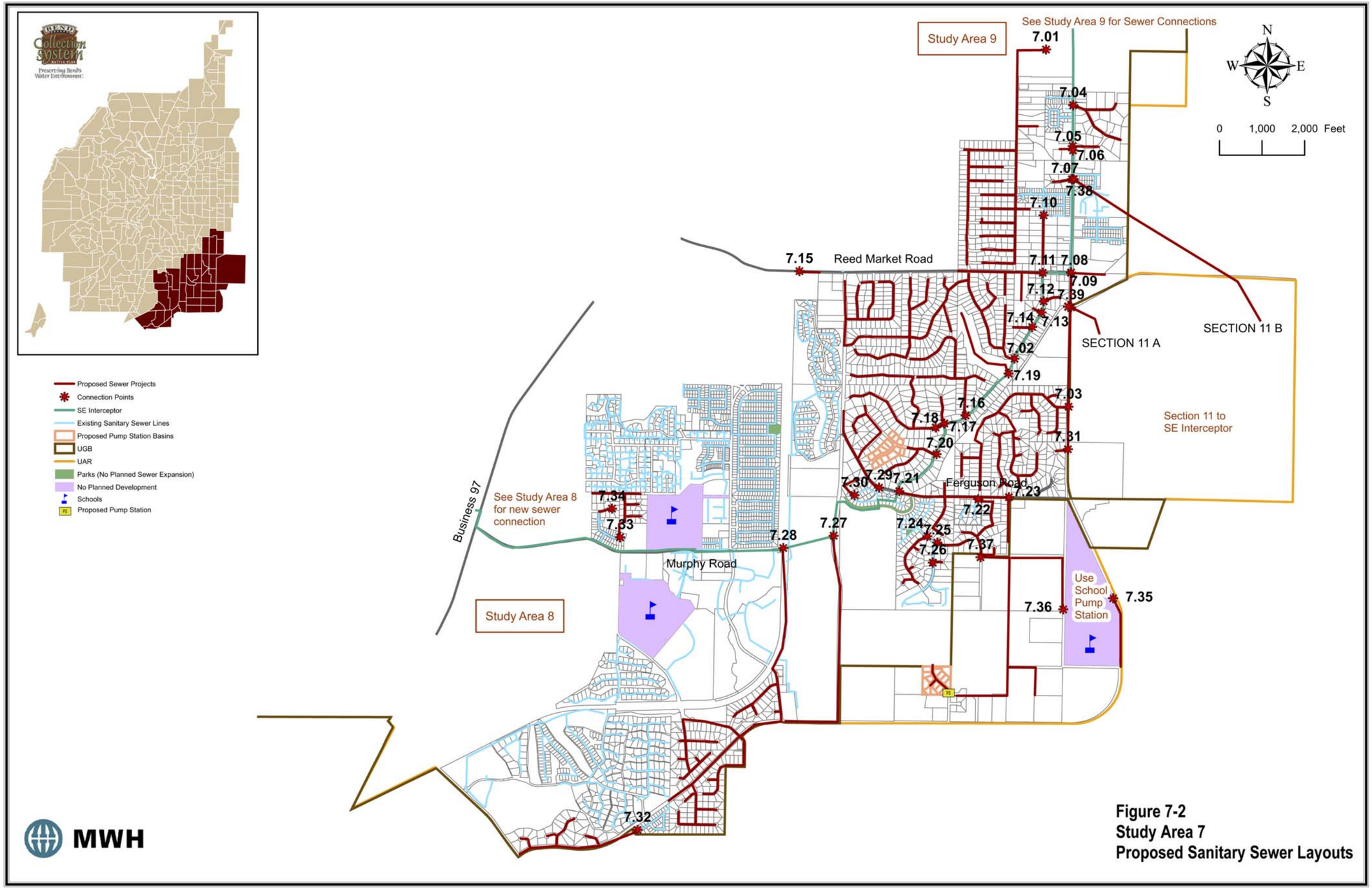


Figure 7-2
Study Area 7
Proposed Sanitary Sewer Layouts

station is 9-gpm with a peak hour flow of 35-gpm. The build-out estimated base flow for this station is 29-gpm with a peak flow of 80-gpm. The force main for this pump station is a 38-foot long 4-inch line. The design velocity in this force main under firm pumping conditions is 3.2-fps. The design TDH for this station is currently 48-feet. The existing station capacity of 125-gpm will meet the long-term requirements of the service area.

Crown Villa RV #1 and #2

The Crown Villa RV #1 and #2 Pump Stations were part of the original Juniper Ridge Utility System. The service areas for each of these stations are at build-out. These stations pump to a common pressure header the discharges into the Murphy Road Pump station. No detailed analysis was done on this system for the 2006 Collection System Master Plan. The City staff has stated that the existing station capacities of 80-gpm will meet the long-term requirements of the respective service areas.

Darnell Estates

The Darnell Estates Pump Station serves an area of 69 acres. This station service area is currently 3% sewered serving 8 of the 283 potential build-out dwelling units. The current (2005) estimated base flow for this station is 1-gpm with a peak hour flow of 17-gpm. The build-out estimated base flow for this station is 37-gpm with a peak flow of 98-gpm. The force main for this pump station is a 528-foot long 4-inch line. The design velocity in this force main under firm pumping conditions is 4.3-fps. The design TDH for this station is currently 25-feet. The existing station capacity of 170-gpm will meet the long-term requirements of the service area.

Desert Skies

The Desert Skies Pump Station serves an area of 142 acres. This station service area is currently 38% sewered serving 200 of the 531 potential build-out dwelling units. The current (2005) estimated base flow for this station is 28-gpm with a peak hour flow of 92-gpm. The build-out estimated base flow for this station is 65-gpm with a peak flow of 176-gpm. The force main for this pump station is a 649-foot long 4-inch line. The design velocity in this force main under firm pumping conditions is 2.4-fps. The design TDH for this station is currently 32-feet. The existing station capacity of 95-gpm will ***NOT*** meet the long-term requirements of the service area.

Foxborough

The Foxborough Pump Station serves an area of 88 acres. This station service area is currently 60% sewered serving 384 of the 636 potential build-out dwelling units. The current (2005) estimated base flow for this station is 53-gpm with a peak hour flow of 138-gpm. The build-out estimated base flow for this station is 77-gpm with a peak flow of 192-gpm. The force main for this pump station is a 2837-foot long 6-inch line. The design velocity in this force main under firm pumping conditions is 3.0-fps. The design TDH for this station is currently 66-feet. The existing station capacity of 260-gpm will meet the long-term requirements of the service area.

Nottingham #1

The Nottingham #1 Pump Station serves an area of 63 acres. This station service area is currently 47% sewered serving 98 of the 208 potential build-out dwelling units. The current (2005) estimated base flow for this station is 14-gpm with a peak hour flow of 45-gpm. The build-out estimated base flow for this station is 23-gpm with a peak flow of 65-gpm. The force main for this pump station is a 4-inch line. This station pumps through the common force main network of the original Juniper Ridge development ultimately discharging to the Murphy Road Regional Pump Station. No detailed analysis was done on this system for the 2006 Collection System Master Plan. The existing station capacity of 76-gpm will meet the long-term requirements of the service area.

Nottingham #2

The Nottingham #2 Pump Station serves an area of 131 acres. This station service area is currently 39% sewered serving 170 of the 437 potential build-out dwelling units. The current (2005) estimated base flow for this station is 24-gpm with a peak hour flow of 81-gpm. The build-out estimated base flow for this station is 49-gpm with a peak flow of 202-gpm. This station receives flow from the Nottingham #1 Pump Station. The force main for this pump station is a 4-inch line. This station pumps through the common force main network of the original Juniper Ridge development ultimately discharging to the Murphy Road Regional Pump Station. No detailed analysis was done on this system for the 2006 Collection System Master Plan. The existing station capacity of 55-gpm will ***NOT*** meet the long-term requirements of the service area.

Quail Ridge #1 and #2

The Quail Ridge #1 and #2 Pump Stations serve areas within the original Juniper Ridge Utility. The flows from these stations are discharged through an existing pressure network to the Murphy Road Regional Pump Station. No detailed analysis was done on this system for the 2006 Collection System Master Plan. The existing station capacities of 100-gpm each will meet the long-term requirements of the service area, based on input from City staff.

Ridgewater #1

The Ridgewater #1 Pump Station serves an area of 26 acres. This station service area is currently 40% sewered serving 43 of the 108 potential build-out dwelling units. The current (2005) estimated base flow for this station is 6-gpm with a peak hour flow of 19-gpm. The build-out estimated base flow for this station is 9-gpm with a peak flow of 26-gpm. The force main for this pump station is a 1432-foot long 4-inch line that is shared with four other pump stations. The design TDH for this station is 82-feet. The design velocity in this force main will vary depending on the number of stations that are pumping into the common line. The existing station capacity of 125-gpm will meet the long-term requirements of the service area.

Ridgewater #2

The Ridgewater #2 Pump Station serves an area of 69 acres. This station service area is currently 37% sewered serving 75 of the 202 potential build-out dwelling units. The current (2005) estimated base flow for this station is 10-gpm with a peak hour flow of 37-gpm. The build-out estimated base flow for this station is 21-gpm with a peak flow of 62-gpm. The force main for this pump station is an 88-foot long 4-inch line that discharges to a force main that is shared with four other pump stations. The design TDH for this station is 73-feet. The design velocity in this force main will vary depending on the number of stations that are pumping into the common line. The existing station capacity of 118-gpm will meet the long-term requirements of the service area.

South Fire Station

The South Fire Station Pump Station is a small station that serves the South Fire Station. This station has two 65-gpm pumps with one of the pumps a redundant unit. The force main for this pump station is a 2-

inch line. The design velocity in this force main under firm pumping conditions is 6.6-fps. The service requirements for this station will not change in the future so this station will meet the long-term requirements of the service area.

Stonehaven

The Stonehaven Pump Station serves an area of 74 acres. This station service area is currently 30% sewered serving 40 of the 133 potential build-out dwelling units. The current (2005) estimated base flow for this station is 6-gpm with a peak hour flow of 29-gpm. The build-out estimated base flow for this station is 20-gpm with a peak flow of 60-gpm. This station serves an area that was within the original Juniper Ridge Utility service area. The flows from this station is discharged through an existing pressure network to the Murphy Road Regional Pump Station. No detailed analysis was done on this system for the 2006 Collection System Master Plan. The existing station capacity of 250-gpm will meet the long-term requirements of the service area.

Sun Meadows

The Sun Meadows Pump Station serves an area of 142 acres. This station service area is currently 30% sewered serving 196 of the 651 potential build-out dwelling units. The current (2005) estimated base flow for this station is 27-gpm with a peak hour flow of 90-gpm. The build-out estimated base flow for this station is 74-gpm with a peak flow of 196-gpm. The force main for this pump station is a 6-inch line. The design velocity in this force main under firm pumping conditions is 4.3-fps. The existing station capacity of 380-gpm will meet the long-term requirements of the service area.

The Pines #1, #2, #3, #4, #5, #6 and #7

The Pines #1, #2, #3, #4, #5, #6 and #7 Pump Stations serve areas within the original Juniper Ridge Utility. The flows from these stations are discharged through an existing pressure network to the Murphy Road Regional Pump Station. No detailed analysis was done on this system for the 2006 Collection System Master Plan. The existing station capacities of 60-gpm each will meet the long-term requirements of the service area, based on input from City staff.

PUMP STATION UPGRADES

Pump station upgrades will be required to ensure that adequate pumping capacity is available to ensure that there are no Sanitary Sewer Overflows (SSOs) in the system. The station capacity has been developed to ensure that adequate redundancy is provided. The cost of pump station upgrades is summarized in ***Table 7-4***.

Table 7-4
Recommended Pump Station Upgrades

Project ID	Pump Station Name	Upgrade	Cost ($)	Period
7.PS01	Desert Skies	Replace with new 180 gpm pumps	$30,500	When capacity is reached
7.PS02	Nottingham #2	Replace with new 200 gpm pumps	$30,500	When capacity is reached

Desert Skies

The existing station capacity of 95-gpm will not meet the long-term requirements of the service area. The existing force main is adequate for the increased station flow. The cost to replace the pumps with new pumps to provide a capacity of 180-gpm is estimated at $30,500.

Nottingham #2

The existing station capacity of 55-gpm will not meet the long-term requirements of the service area. The pumps will need to be replaced with new 200-gpm pumps to provide for the long-term needs of the service area. The existing force main is adequate as the new design velocity at 100-gpm will be 2.6-fps at a TDH of 31-feet. The estimated cost for installing new pumps in this station is $30,500.

REMOVAL OF EXISTING PUMP STATIONS

Each of the existing pump stations was evaluated to determine if they could be removed from service. To remove the pump stations from service, a new gravity trunk will need to be constructed to transport the flow from the existing pump station influent sewer to another point in the collection system. The pump stations that can be removed from service are shown in ***Table 7-5***.

Blue Ridge

The Blue Ridge Pump Station can be removed from service with the installation of sewers on the unsewered parcels east of the station. These gravity sewers are shown as Project 7.28 on ***Figure 7-2***. This area will flow by gravity to the new SE Interceptor. This inter-tie can be done at an estimated cost of $16,000. The estimated project cost is $41,000 which includes the cost to remove the pump station from service.

Table 7-5
Recommended Pump Station Decommissioning

Project ID	Pump Station Name	Upgrade	Cost ($)	Period
7.PS03	Blue Ridge	Installation of inter-tie to new gravity sewers	$16,000	When Project 7.28 is completed
7.PS04	Blue Ridge	Removal of Pump station	$25,000	On completion of Project 7.PS03
7.PS05	Darnell Estates	Construction of a 300-foot 8” Sewer	$49,000	When SE Interceptor is completed
7.PS06	Darnell Estates	Removal of Pump station	$25,000	On completion of Project 7.PS05
7.PS07	Desert Skies	Construction of a 550-foot 8” Sewer	$86,000	When SE Interceptor is completed
7.PS08	Desert Skies	Removal of Pump station	$25,000	On completion of Project 7.PS07
7.PS09	Ridgewater #1	Construction of 250-foot 8” Sewer	$39,000	When SE Interceptor is completed
7.PS10	Ridgewater #1	Removal of Pump station	$25,000	On completion of Project 7.PS09
7.PS11	Sun Meadows	Construction of 1500-foot 8” Sewer	$204,000	When SE Interceptor is completed
7.PS12	Sun Meadows	Removal of Pump station	$25,000	On completion of Project 7.PS11

Darnell Estates

The Darnell Estates Pump Station can be removed from service with the construction of a 300-foot 8-inch gravity sewer that discharges to the SE Interceptor on 27th Street. The estimated project cost to construct

the gravity sewer to remove the station from service is $49,000. The estimated cost to remove the pump station is $25,000. A present value analysis of this project was done to determine the cost-effectiveness of this project. In this analysis it was assumed that the project would occur in the year 2015. Growth in the area would grow at a constant growth rate until build-out of the area occurs in 2035. Based on these assumptions, the 20-year and 50-year present values for continuing operation of the station (starting in 2006) are $194,000 and $517,000, respectively. Based on the same assumptions, the 20-year and 50-year present values for removing the pump station in 2015 are $153,000 and $159,000, respectively. This analysis shows that replacement of the pump station is cost-effective following the construction of the SE Interceptor.

Desert Skies

The Desert Skies Pump Station can be removed from service with the construction of a 550-foot 8-inch trunk sewer that discharges to the SE Interceptor on 27th Street. The estimated project cost to construct the gravity sewer to remove the station from service is $86,000. The estimated cost to remove the pump station is $25,000. A present value analysis of this project was done to determine the cost-effectiveness of this project. In this analysis it was assumed that the project would occur in the year 2015. Growth in the area would grow at a constant growth rate until build-out of the area occurs in 2024. Based on these assumptions, the 20-year and 50-year present values for continuing operation of the station (starting in 2006) are $255,000 and $642,000, respectively. This includes the cost of a pump station capacity upgrade in the year 2010. Based on the same assumptions, the 20-year and 50-year present values for removing the pump station in 2015 are $191,000 and $199,000, respectively. This analysis shows that replacement of the pump station is cost-effective following the construction of the SE Interceptor.

Ridgewater #1

The Ridgewater #1 Pump Station can be removed from service with the construction of a 250-foot 8-inch trunk sewer that discharges to the SE Interceptor at 15th Street. The estimated project cost to construct the gravity sewer to remove the station from service is $39,000. The estimated cost to remove the pump station is $25,000. A present value analysis of this project was done to determine the cost-effectiveness of this project. In this analysis it was assumed that the project would occur in the year 2015. Growth in the area would grow at a constant growth rate until build-out of the area occurs in 2014. Based on these assumptions, the 20-year and 50-year present values for continuing operation of the station (starting in 2006) are $206,000 and $500,000, respectively. Based on the same assumptions, the 20-year and 50-year present values for removing the pump station in 2015 are $149,000 and $152,000, respectively. This analysis shows that replacement of the pump station is cost-effective following the construction of the SE Interceptor.

Sun Meadows

The Sun Meadows Pump Station can be removed from service with the construction of a 1500-foot 8-inch trunk sewer that discharges to the newly sewered area located on the east side of the Foxborough Pump Station service area. The estimated project cost to construct the gravity sewer to remove the station from service is $204,000. The estimated cost to remove the pump station is $25,000. A present value analysis of this project was done to determine the cost-effectiveness of this project. In this analysis it was assumed that the project would occur in the year 2015. Growth in the area would grow at a constant growth rate until build-out of the area occurs in 2027. Based on these assumptions, the 20-year and 50-year present values for continuing operation of the station (starting in 2006) are $235,000 and $620,000, respectively. Based on the same assumptions, the 20-year and 50-year present values for removing the pump station in 2015 are $323,000 and $341,000, respectively. This analysis shows that replacement of the pump station is cost-effective in the long-term, once the area to the east of the Foxborough Pump Station service area is sewered.

SYSTEM DEFICIENCIES

The City's Collection System was evaluated to determine if there were any deficiencies under existing and build-out flows. The analysis was performed using the calibrated 2005 INFOSWMM hydraulic model. The system modeling showed that there are no existing or future deficiencies in this area. This is mostly because future flows in this developing area will be handled by the new SE Interceptor.

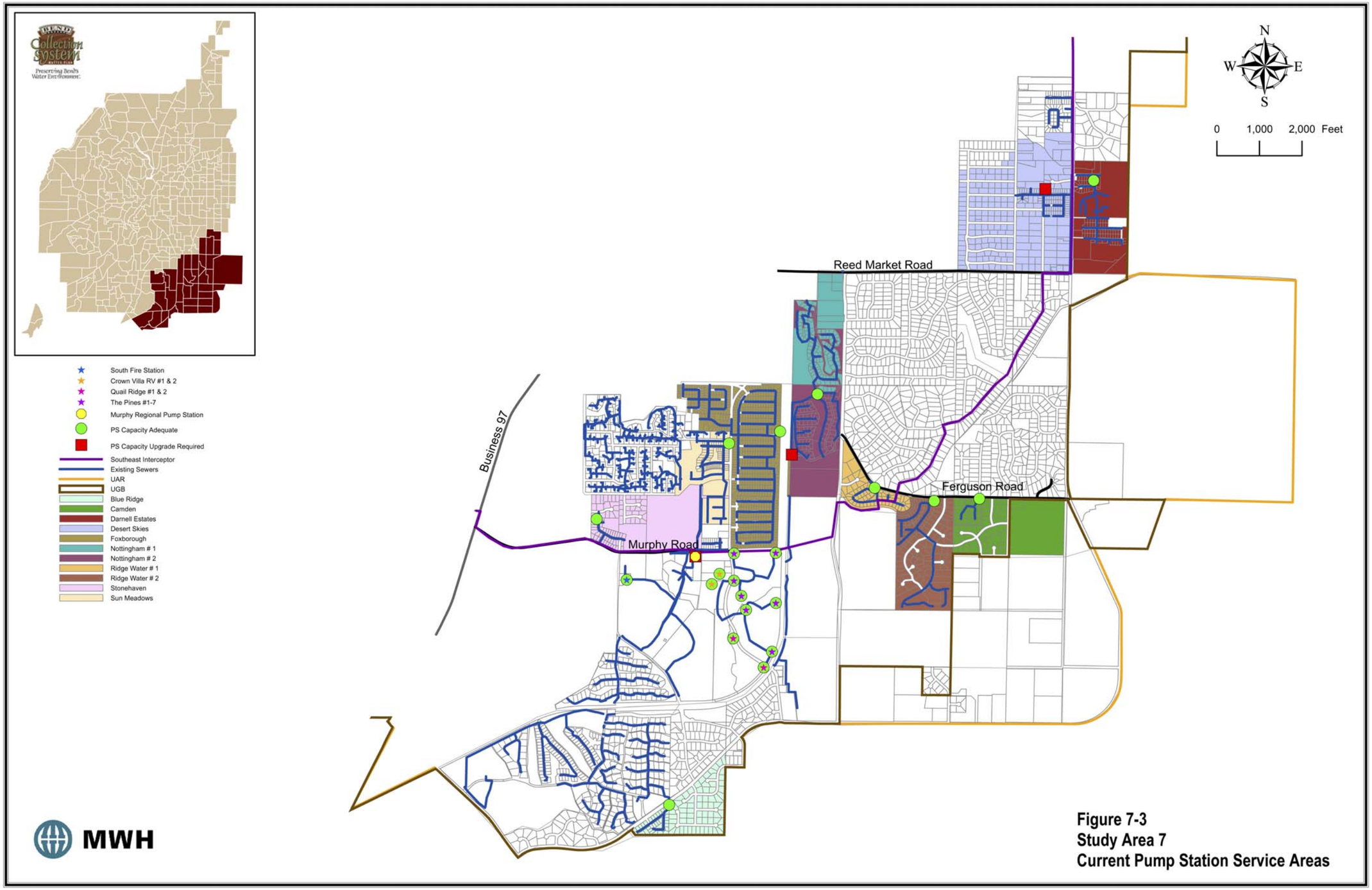
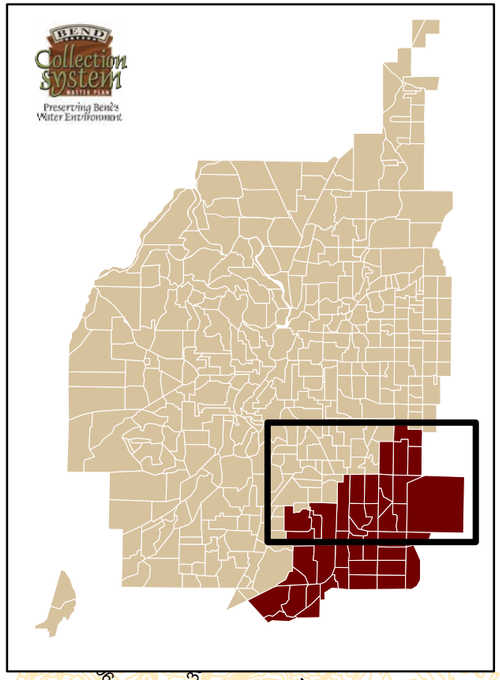


Figure 7-3
Study Area 7
Current Pump Station Service Areas

APPENDIX



Reed Market Road

Ferguson Road

27th Street

Business 97

SECTION 11 A

SECTION 11 B

7.01 7.04 7.06 7.05 7.38 7.07 7.10 7.15 7.11 7.08 7.09 7.12 7.39 7.13 7.14 7.02 7.19 7.03 7.16 7.17 7.18 7.20 7.31 7.29 7.21 7.30 7.22 7.23 7.34

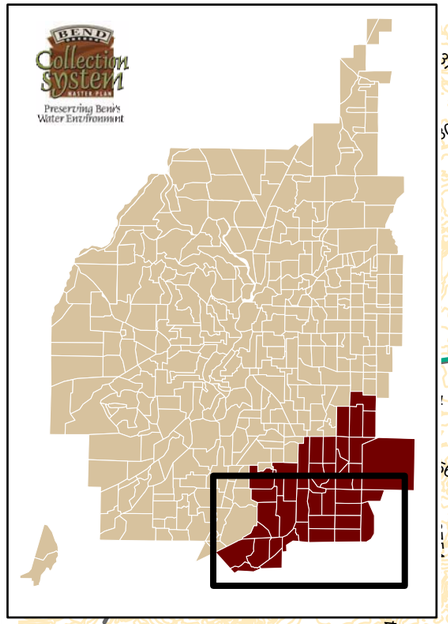
Proposed Sewer Projects
Connection Points
SE Interceptor
Proposed Pump Station Basins
Existing Sanitary Sewer Lines
UGB
UAR
No Planned Development
Parks (No Planned Sewer Expansion)
Schools

0 1,000 2,000 Feet

MWH

Figure A.7-1
Study Area 7
Proposed Sanitary Sewer Layouts

N W E S



Murphy Road

Ferguson Road

27th Street

Knott Road

7.2
7.21
7.22
7.23
7.24
7.25
7.26
7.27
7.28
7.29
7.3
7.31
7.32
7.33
7.34
7.35
7.36
7.37

Proposed Sewer Projects
Connection Points
SE Interceptor
Proposed Pump Station Basins
Existing Sanitary Sewer Lines
UGB
UAR
No Planned Development
Parks (No Planned Sewer Expansion)
Schools
Proposed Pump Station

0 1,000 2,000 Feet

MWH

Figure A.7-2
Study Area 7
Proposed Sanitary Sewer Layouts

N
W E
S