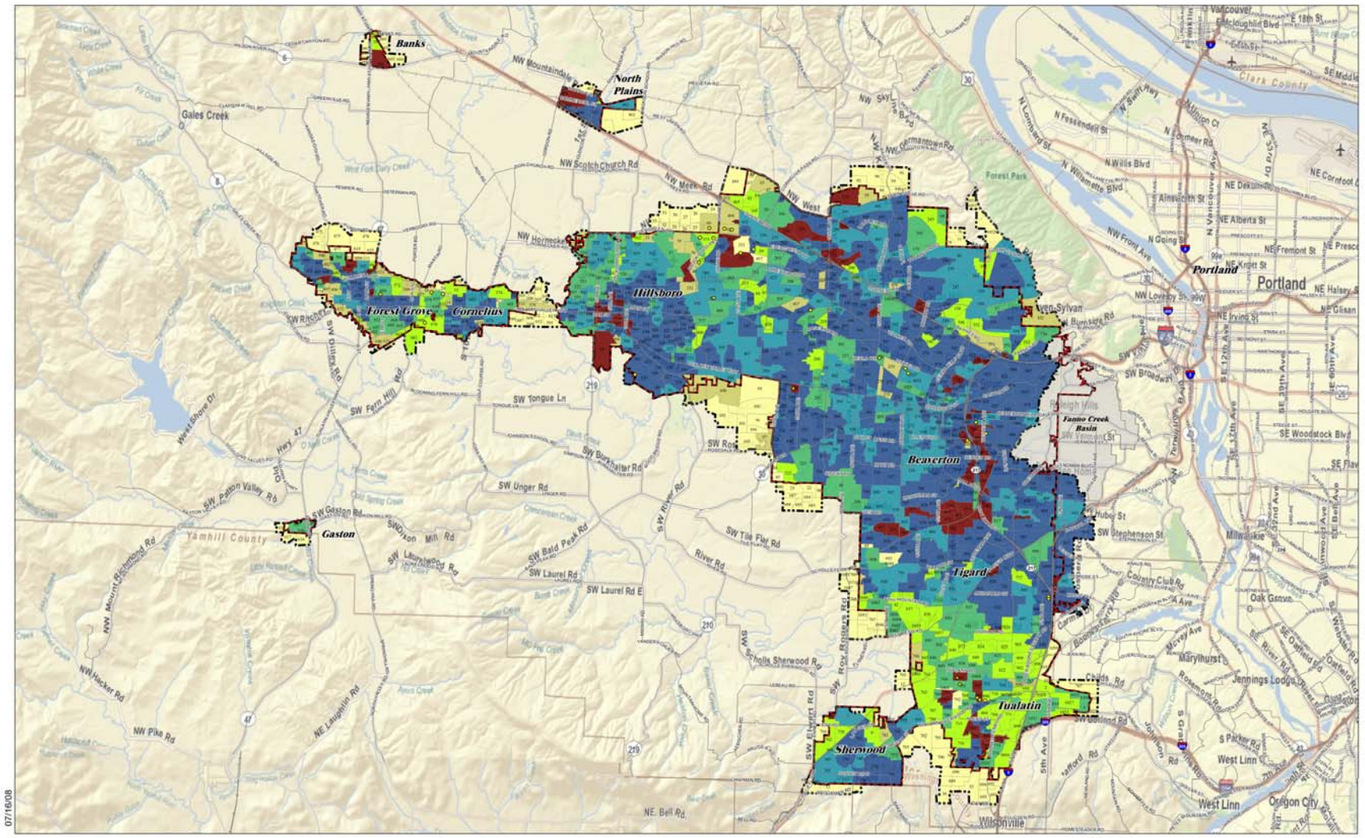

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APPENDIX P

Pump Station Master Plan Data Sheets

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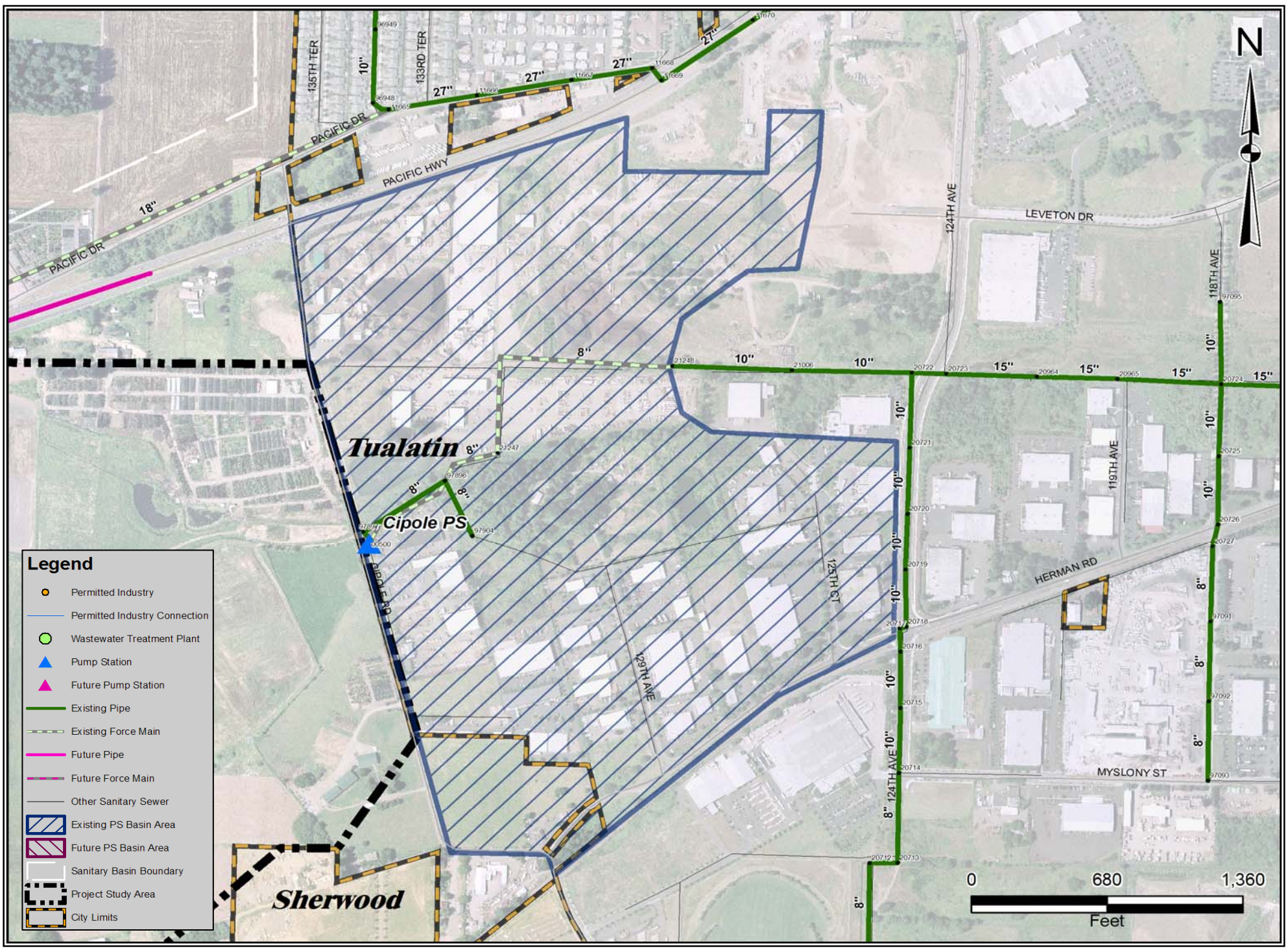
Consulting Engineers

SAMPLE PUMP STATION DATA SHEET



Cipole PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	157	1.36	0.03	90	0.41	1.81	0.15	213	0	0	287	N
2015 Conditions[9]	167	1.49	0.04	90	0.46	2.03	0.10	249	0	0	190	N
Buildout Conditions[9]	198	1.97	0.06	90	0.66	2.91	-0.10	389	0	0	-189	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.66	2.91	-0.10	389	N/A	N/A	N/A	N/A
Firm Capacity					0.56							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Cipole

Pump station and force main are adequately sized for flows anticipated through 2015. A pump station upgrade will be needed to accommodate the modeled buildout flows.

The basin is occupied by industrial and commercial uses, which tend to have wide ranging flow generation characteristics. Actual flows may be signficantly different than modeled flows. For planning purposes, it is assumed that replacement of pumping equipment and controls will be adequate to provide the necessary buildout capacity.

Cipole PS

Firm Capacity: 0.56 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 8 in
FM Length: 1,100 ft

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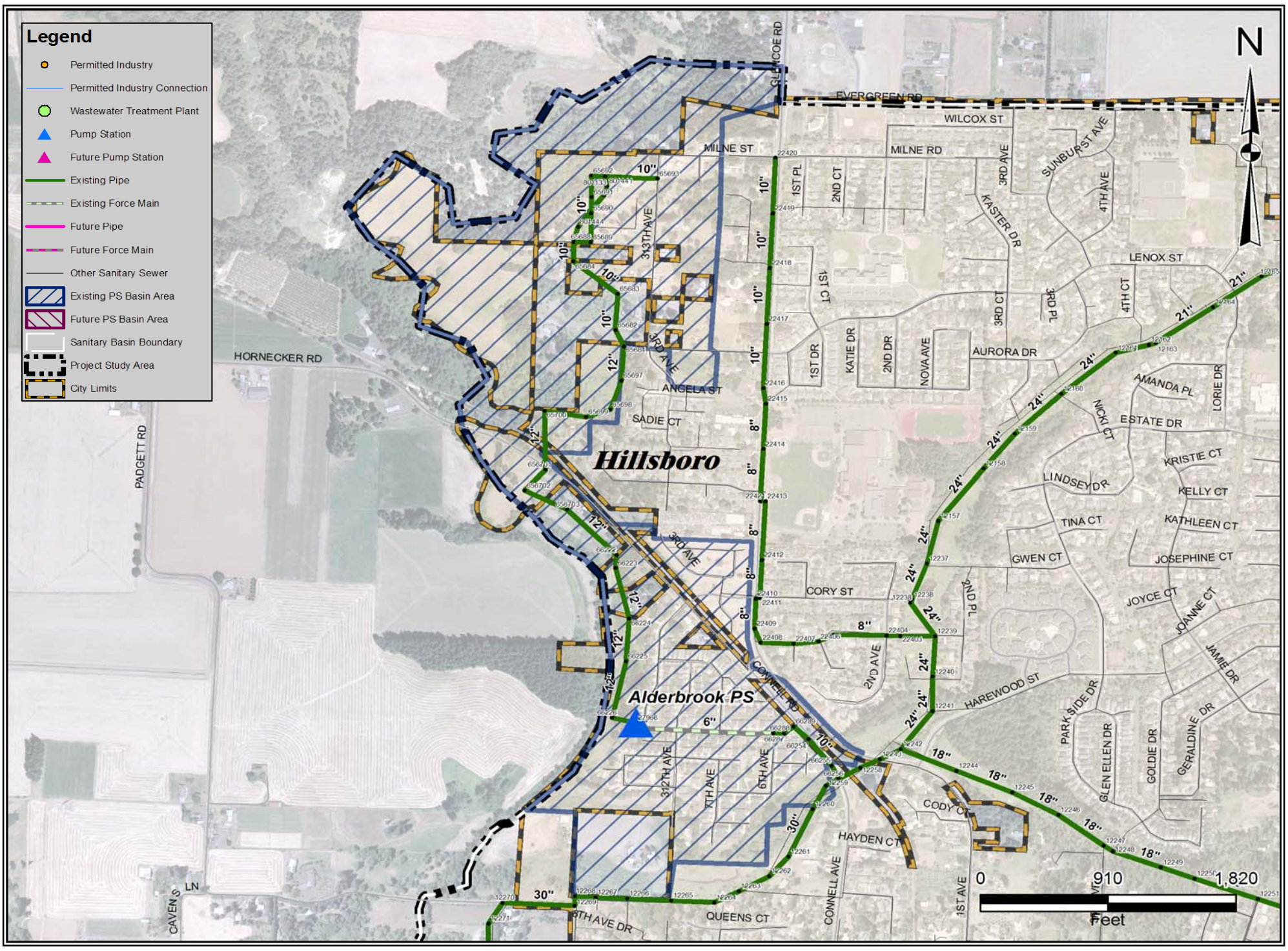

Alderbrook PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	74	3.14	0.04	1,880	0.39	6.97	0.76	232	232	557	1,454	N
2015 Conditions[9]	74	3.67	0.04	1,880	0.40	7.13	0.75	272	238	570	1,437	N
Buildout Conditions[9]	170	3.20	0.09	1,880	0.49	8.67	0.66	545	486	1,166	1,270	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.49	8.67	0.66	545	N/A	N/A	N/A	N/A
Firm Capacity					1.15							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Alderbrook

Pump station and force main are adequately sized for buildout.

Alderbrook PS

Firm Capacity: 1.15 mgd
No. Pumps: 2
Basin: Hillsboro
FM Diameter: 4 in
FM Length: 1,016 ft

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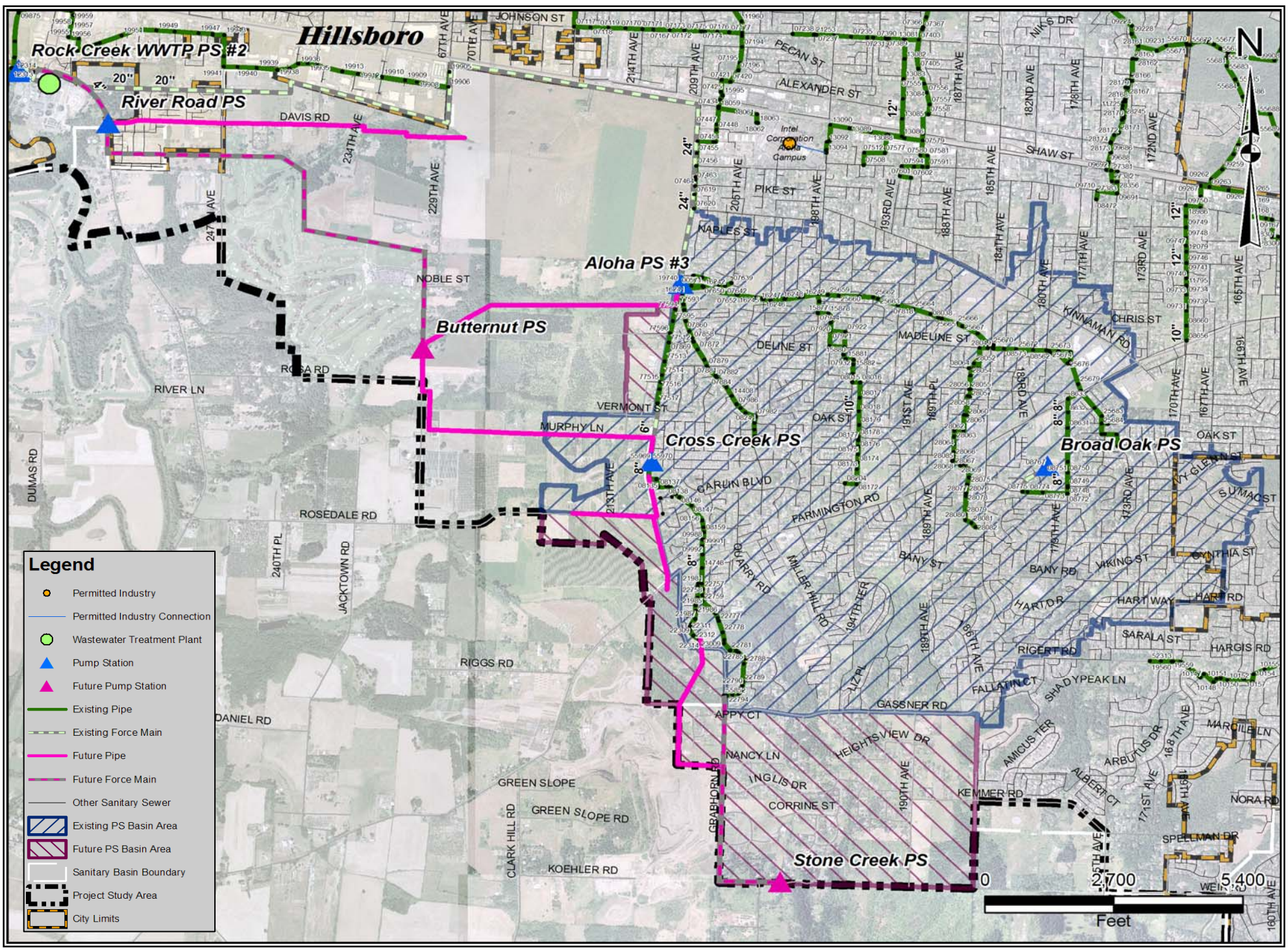

Aloha PS #3

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	2,190	3.41	1.20	2,130	7.99	2.83	7.01	7,461	5,903	14,167	13,435	N
2015 Conditions[9]	2,200	6.78	2.40	2,410	10.38	3.68	4.62	14,908	11,226	26,943	8,851	N
Buildout Conditions[9]	2,652	8.50	3.63	2,360	12.54	4.45	2.46	22,545	16,869	40,485	4,713	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	18.94	6.72	-3.94	22,545	N/A	N/A	N/A	N/A
Firm Capacity					15.00							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Aloha #3

Pump station was recently upgraded to 15 mgd firm capacity with existing twin force mains, which is adequate for buildout flows, including flow from the Cross Creek PS which is currently tributary to Aloha #3. Cross Creek PS will be disconnected in the future when flows are rerouted to the planned Butternut PS in the South Hillsboro growth area.

In the future, flow from Aloha #3 could be routed to the future Butternut Pump Station.

The future connecting gravity sewer from Aloha #3 to Butternut will be relatively deep, unless Aloha #3 is retained as a lift station. In this case, power requirements would be substantially reduced at Aloha #3, but maintenance and other operating costs would continue.

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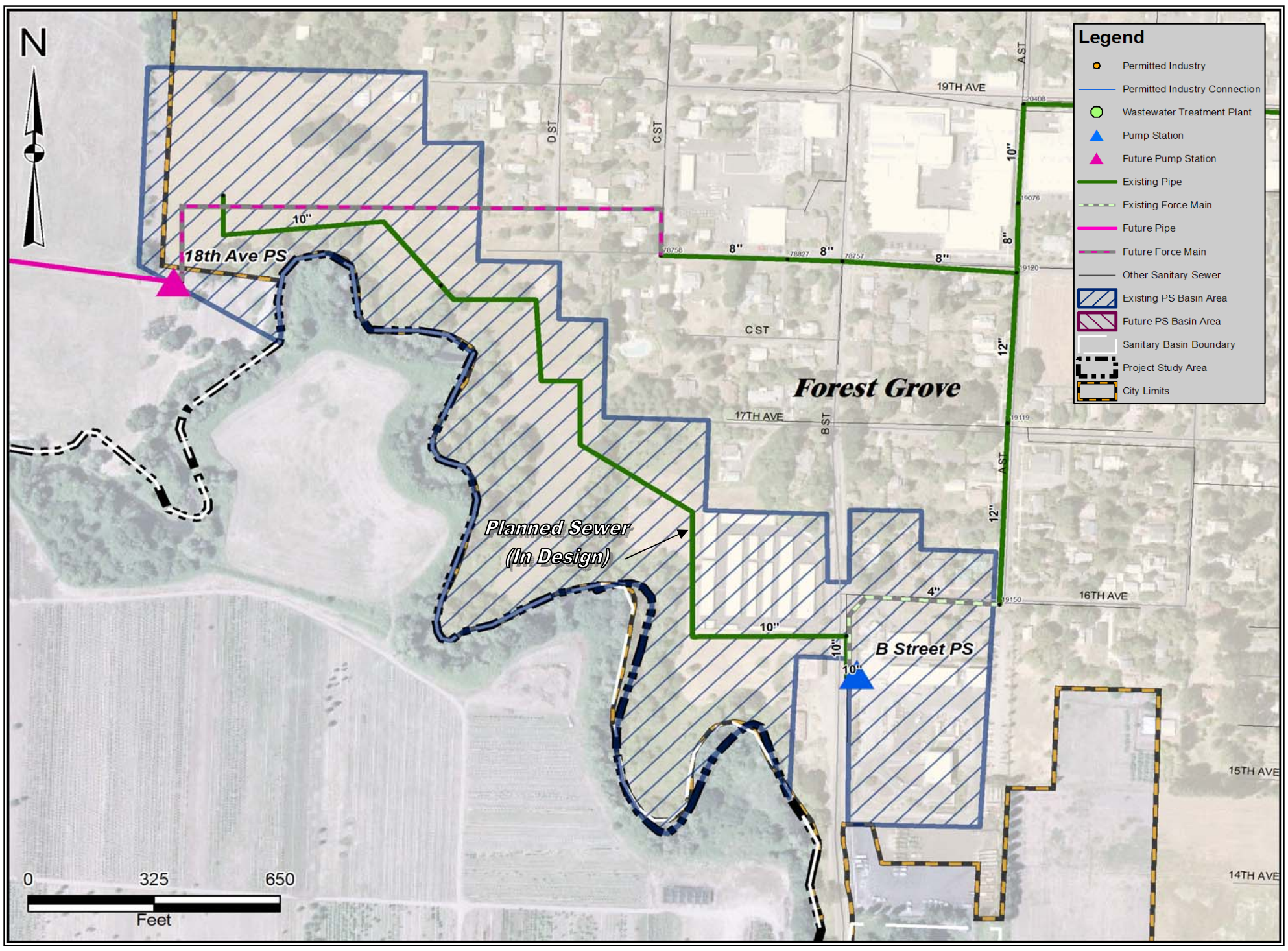
Aloha PS #3

Firm Capacity: 15.00 mgd
No. Pumps: 5
Basin: Rock Creek

FM Diameters: 20 in (dual)
FM Length: 19,484 ft



B Street PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	10	7.83	0.01	1,880	0.05	0.87	0.21	78	9	22	402	N
2015 Conditions[9]	14	18.54	0.04	1,880	0.15	2.69	0.11	258	9	22	206	N
Buildout Conditions[9]	39	22.15	0.14	3,520	0.34	6.06	-0.08	872	622	1,493	-158	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.34	6.06	-0.08	872	N/A	N/A	N/A	N/A
Firm Capacity					0.26							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: B Street

Pump station and force main are adequately sized for flows anticipated through 2015, but will require replacement to accommodate flows after 2015. Buildout flows are approximately two times existing capacity, so it is assumed that a replacement pump station and force main will be constructed. It may be possible to upgrade equipment or and/or upsize the force main without completely replacing the pump station structure.

B Street PS

Firm Capacity: 0.26 mgd
No. Pumps: 2
Basin: Forest Grove
FM Diameter: 4 in
FM Length: 595 ft

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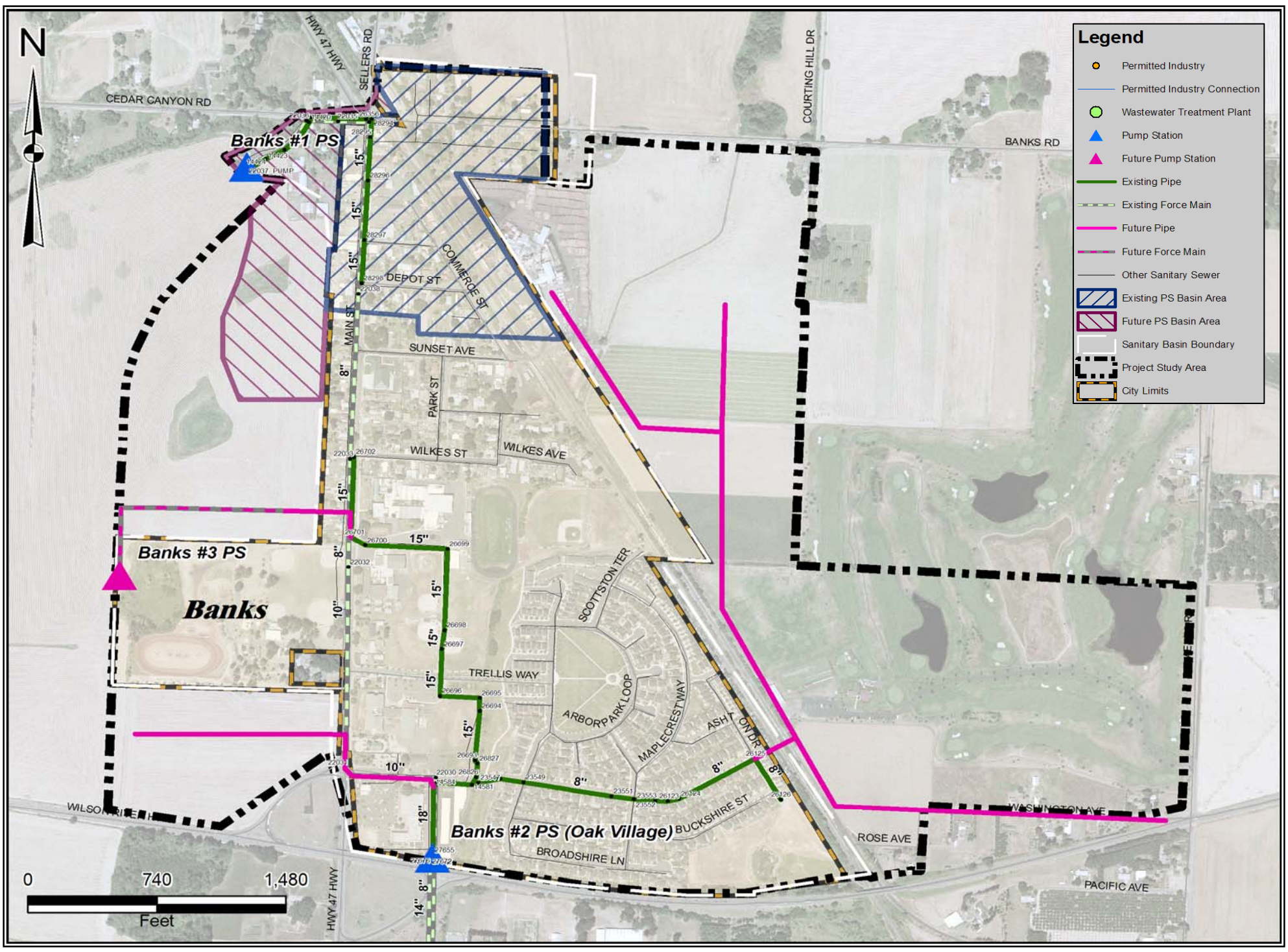

Banks #1 PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	26	4.90	0.02	1,390	0.10	0.46	0.66	125	30	73	1,263	N
2015 Conditions[9]	26	12.30	0.05	2,010	0.19	0.86	0.57	314	193	464	1,088	N
Buildout Conditions[9]	51	12.30	0.10	2,980	0.36	1.58	0.41	628	386	927	778	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.36	1.58	0.41	628	N/A	N/A	N/A	N/A
Firm Capacity					0.76							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Banks #1

Firm capacity is adequate for buildout flows, including growth from areas directly south of the pump station.

Submersible Pumps 1 & 2 are rated at 0.76 mgd (529 gpm) at 100 ft TDH. An above-ground booster pump has a rated capacity of 1.22 mgd (850 gpm) at 177 ft TDH capacity. Firm capacity is limited to the capacity of one submersible pump, assuming the booster pump is not self-priming.

Force main analysis assesses velocities in the 8-inch portions of the force main. It is assumed the force main is not interconnected with the larger Banks #2 (Oak Village) force main.

Banks #1 PS

Firm Capacity: 0.76 mgd
No. Pumps: 2
Basin: Hillsboro
FM Diameter: 8 to 10 in
FM Length: 33,151 ft

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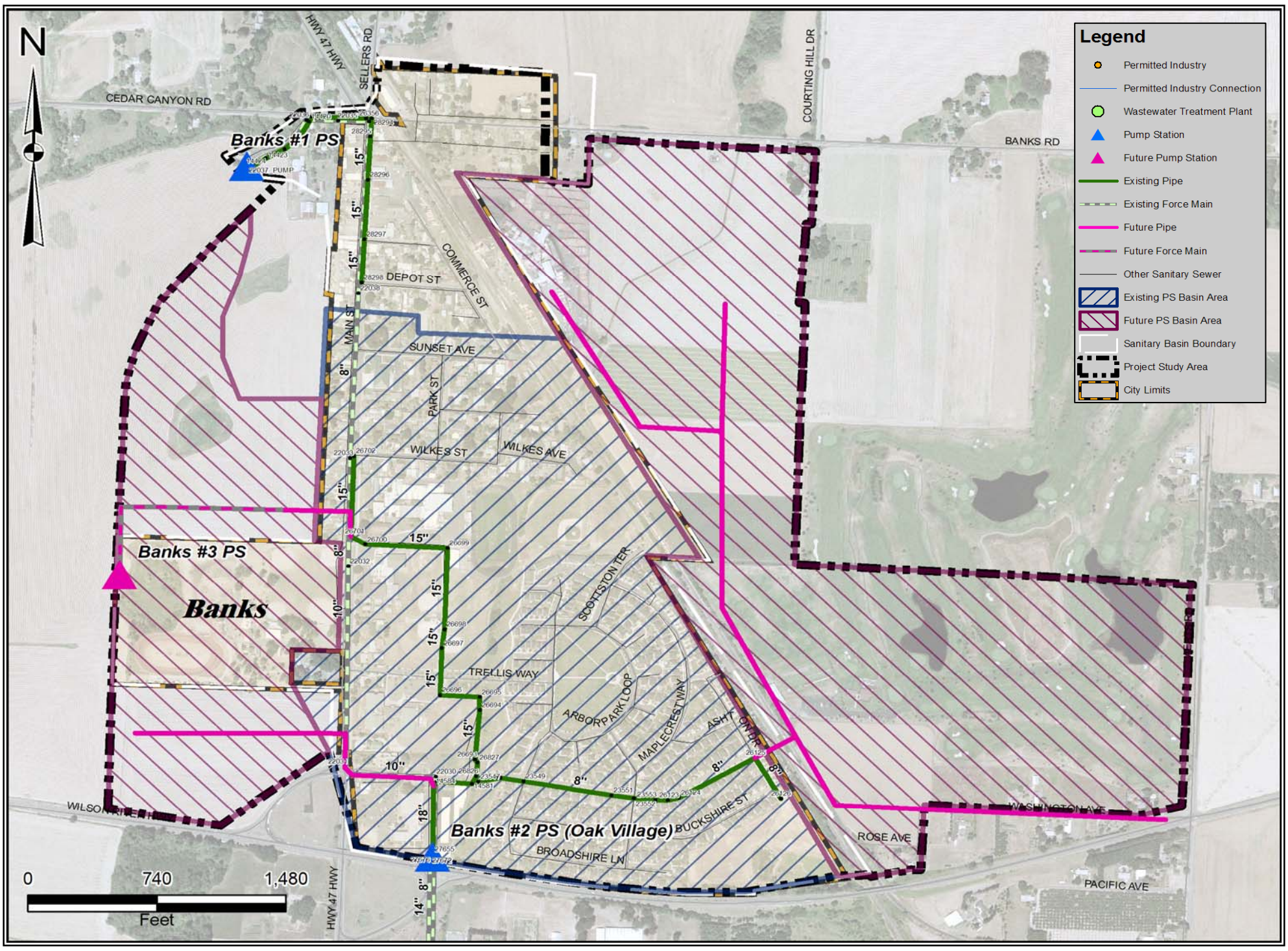

Banks #2 PS (Oak Village)

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	295	2.29	0.11	930	0.49	0.72	0.91	677	119	286	1,746	N
2015 Conditions[9]	295	11.35	0.54	1,890	1.41	2.03	0.00	3,354	1,431	3,433	1	N
Buildout Conditions[9]	392	10.69	0.67	1,860	1.85	2.68	-0.45	4,185	3,659	8,783	-858	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	1.85	2.68	-0.45	4,185	N/A	N/A	N/A	N/A
Firm Capacity					1.41							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Banks #2 (Oak Village)

Pump station would require upsizing to accommodate all potential growth identified for Banks. However, substantial growth can be accommodated without exceeding the current rated capacity of the pump station, and the timing of that growth will determine the timing of the upgrade. Note that development on both the west and east sides of Banks is unlikely.

Force main analysis assesses velocities in the 14-inch portions of the force main. Buildout flows would not result in excessive velocities, so it is likely that the existing force main size is adequate if the pipeline remains in servicable condition. The force main is very long, so pumping head must be carefully considered at the time the pump station upgrade is designed.

Banks # 2 PS

Firm Capacity: 1.41 mgd
No. Pumps: 2
Basin: Hillsboro
FM Diameter: 14 to 16 in
FM Length: 31,440 ft

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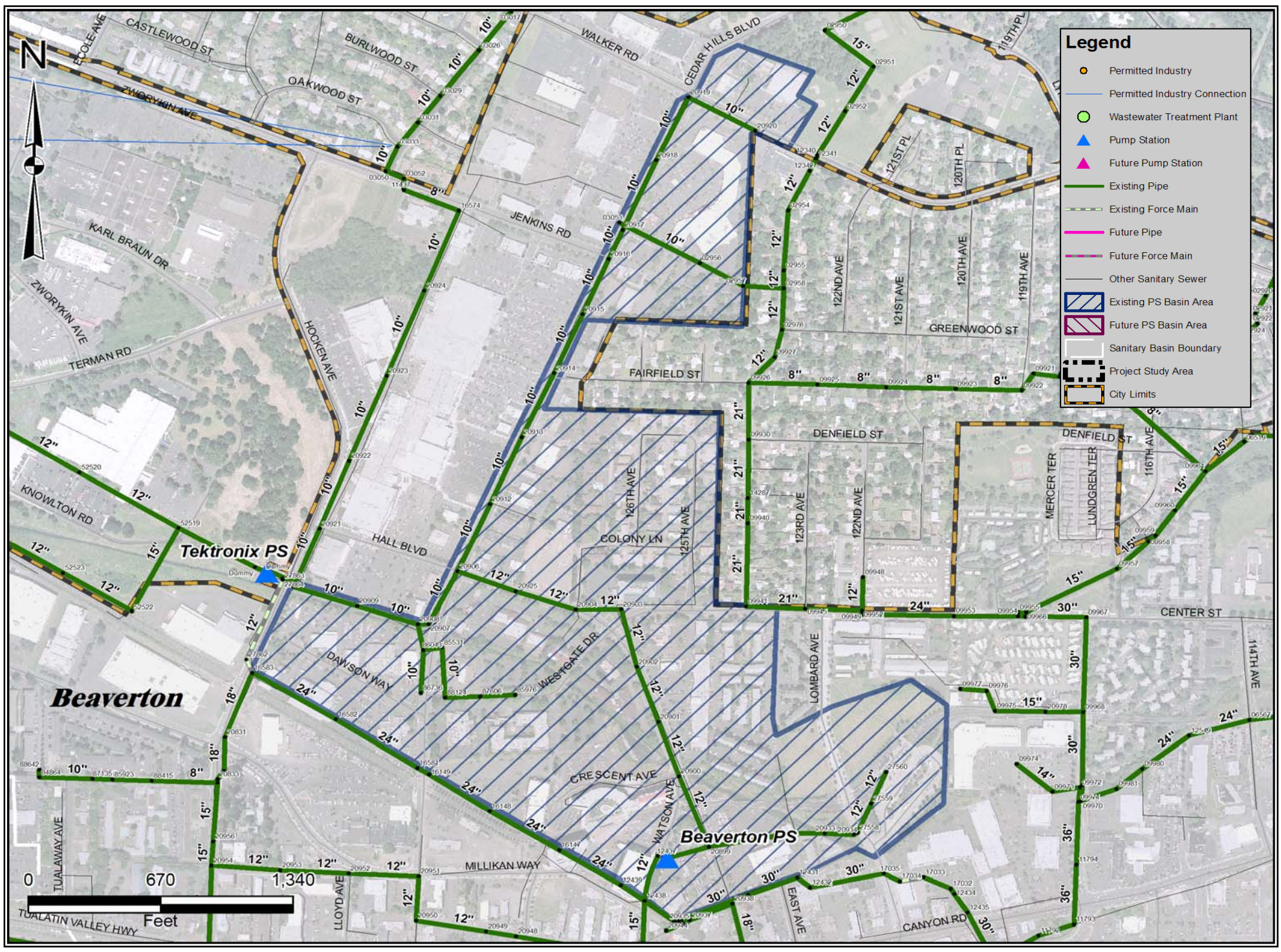

Beaverton PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	109	16.64	0.29	5,660	1.06	8.36	0.09	1,820	1,579	3,790	176	N
2015 Conditions[9]	111	16.74	0.30	5,640	1.07	8.42	0.08	1,863	1,579	3,790	160	N
Buildout Conditions[9]	124	17.80	0.36	5,650	1.17	9.20	-0.01	2,212	1,928	4,627	-28	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	1.17	9.20	-0.01	2,212	N/A	N/A	N/A	N/A
Firm Capacity					1.15							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Beaverton

Modeled flows for 2015 and Buildout slightly exceed the rated pump station capacity. It is assumed that new pumps and controls with adequate capacity can be housed within the existing structure, representing a relatively minor upgrade, as compared to replacement of the station. Actual peak flows should be monitored to determine if and when they approach the rated capacity so the upgrade can be appropriately scheduled.

Beaverton PS

Firm Capacity: 1.15 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 6 in
FM Length: 185 ft

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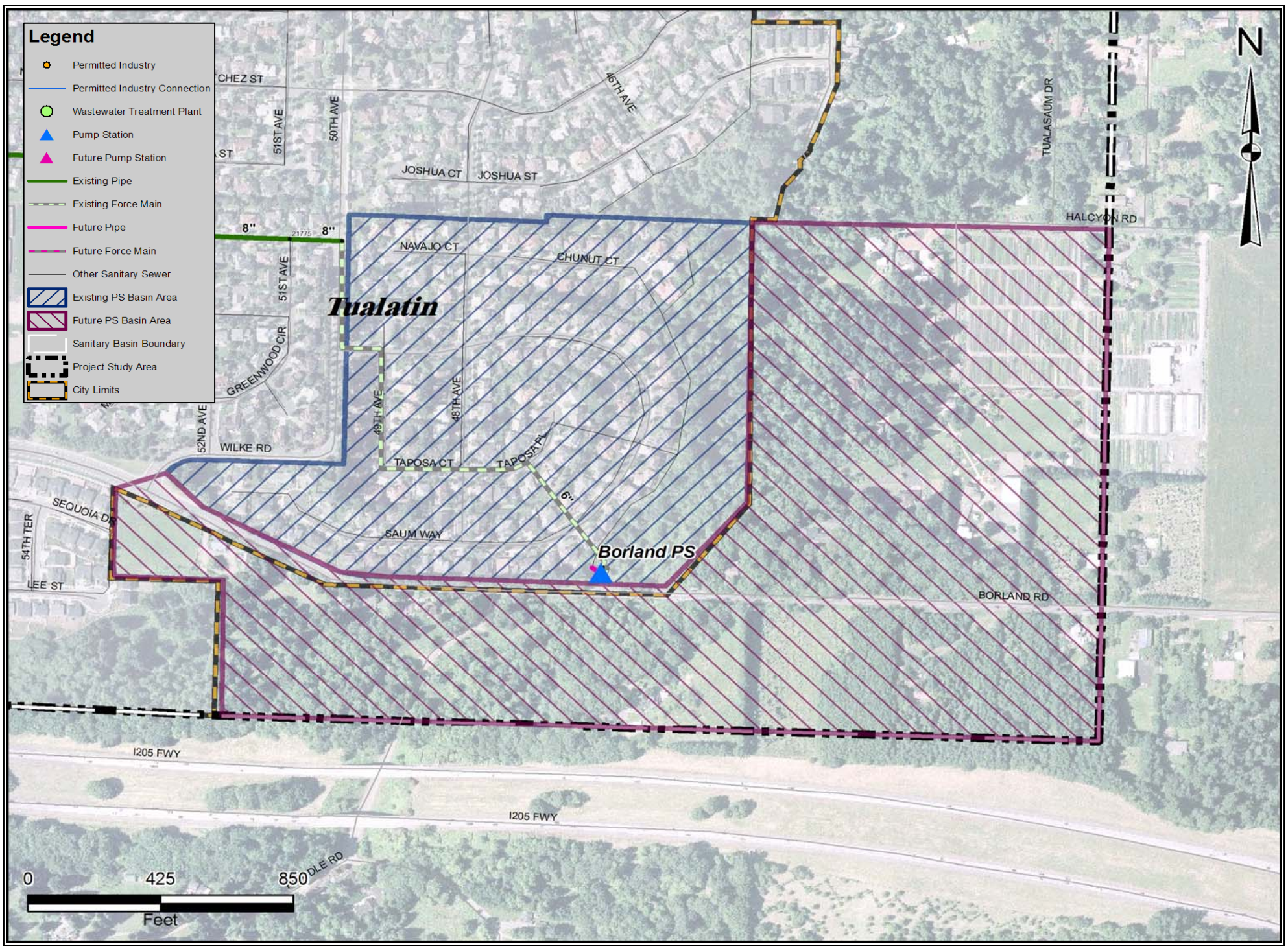

Borland PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	38	6.45	0.04	1,370	0.14	1.13	0.29	246	246	590	553	N
2015 Conditions[9]	46	11.83	0.09	1,600	0.26	2.08	0.17	544	460	1,105	323	N
Buildout Conditions[9]	92	15.95	0.24	3,410	0.81	6.41	-0.38	1,473	1,153	2,766	-730	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.81	6.41	-0.38	1,473	N/A	N/A	N/A	N/A
Firm Capacity					0.43							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Borland

Pump station and force main are adequately sized for buildout of the existing service area. There is a large potential growth area included in the buildout model which would generate flows in excess of the pump station capacity. It is possible that new pumping equipment and controls adequate to accommodate buildout flows could be accomodated within the existing structure and panel; however, for the purposes this master plan it is assumed that the pump station would need to be replaced.

Borland PS

Firm Capacity: 0.43 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 6 in
FM Length: 1,852 ft

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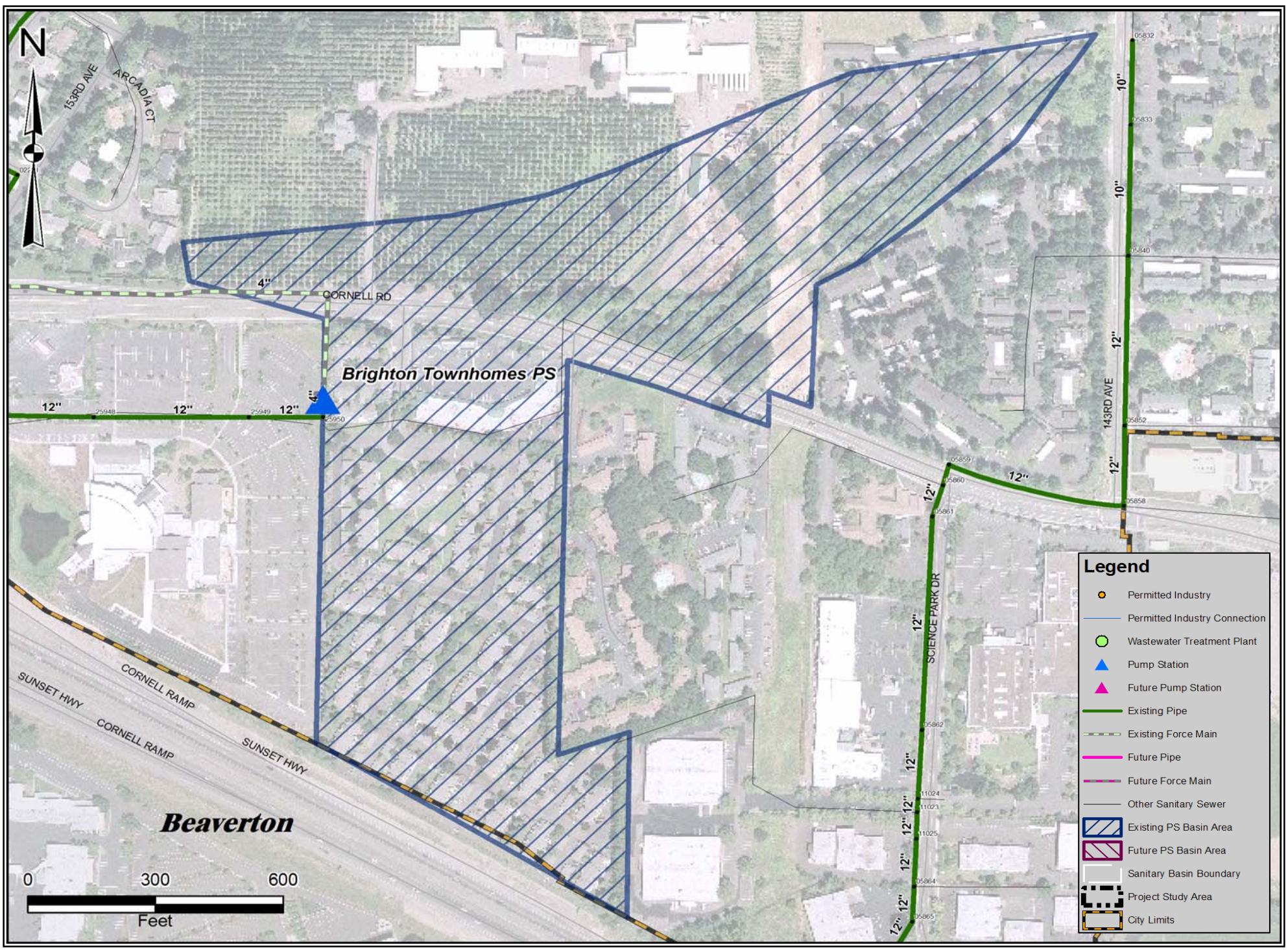

Brighton Townhomes PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	19	11.79	0.04	950	0.10	1.71	0.18	222	206	494	354	N
2015 Conditions[9]	19	11.79	0.04	950	0.10	1.71	0.18	222	206	494	354	N
Buildout Conditions[9]	20	12.19	0.04	950	0.10	1.79	0.18	240	223	536	345	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.00	1.79	0.28	240	N/A	N/A	N/A	N/A
Firm Capacity					0.28							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Brighton Townhomes

Pump station and force main are adequately sized for buildout.

Brighton Townhomes PS

Firm Capacity: **0.28 mgd**
No. Pumps: **2**
Basin: **Rock Creek**
FM Diameter: **4 in**
FM Length: **1,252 ft**

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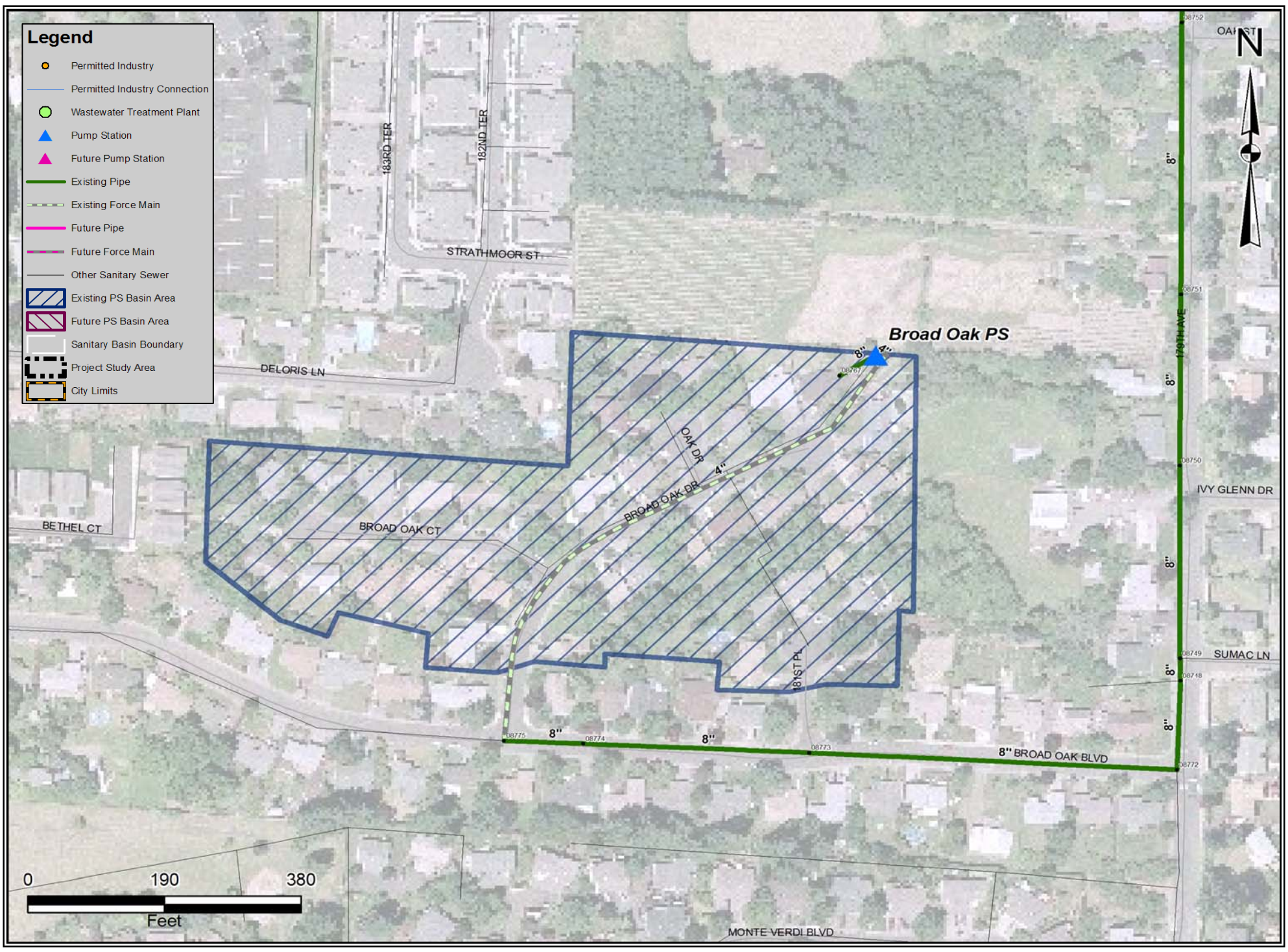

Broad Oak PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	7	1.72	0.002	1,800	0.02	0.36	0.12	12	12	28	237	N
2015 Conditions[9]	7	1.72	0.002	1,800	0.02	0.36	0.12	12	12	28	237	N
Buildout Conditions[9]	8	1.77	0.002	1,800	0.02	0.38	0.12	14	14	34	235	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.00	0.38	0.14	14	N/A	N/A	N/A	N/A
Firm Capacity					0.14							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Broad Oak

Pump station and force main are adequately sized for buildout.

Broad Oak PS

Firm Capacity: 0.14 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 4 in
FM Length: 851 ft

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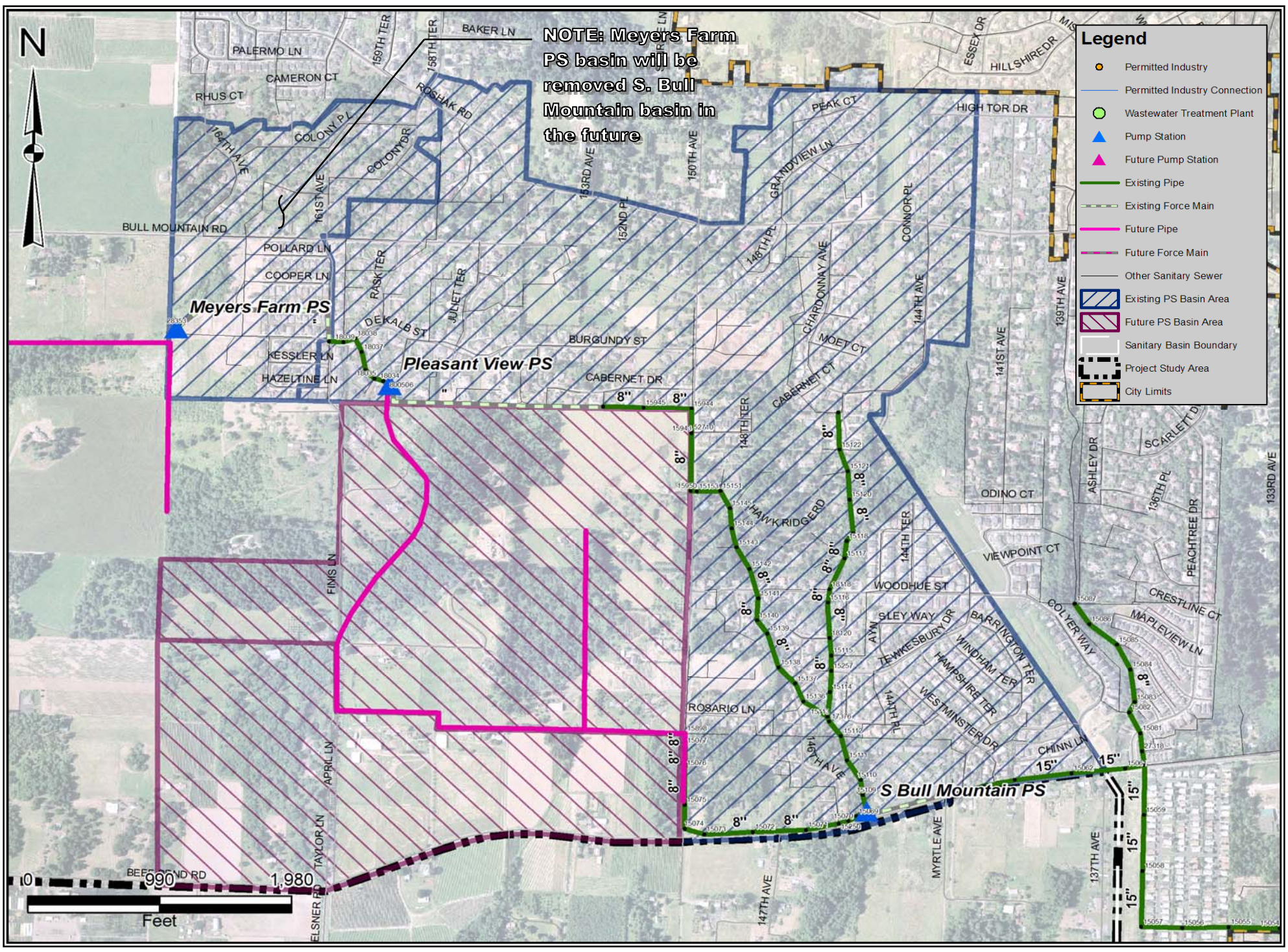

S Bull Mountain PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	402	4.98	0.32	2,410	2.02	3.99	0.57	2,005	2,001	4,802	1,090	N
2015 Conditions[9]	554	10.60	0.94	2,060	4.00	7.31	-1.41	5,869	3,749	8,998	-2,697	Y
Buildout Conditions[9]	652	13.37	1.40	3,520	6.93	12.93	-4.34	8,715	4,815	11,556	-8,310	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	6.93	12.93	-4.34	8,715	N/A	N/A	N/A	N/A
Firm Capacity					2.59							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: S Bull Mountain

Modeled flows for 2015 marginally exceed existing capacity of the pump station. The timing of upgrades will be depedent on the timing of growth in new development areas west of 150th Avenue. Buildout flows substantially exceed the exsting capacity, therefore a replacement pump station is planned.

The tributary area currently includes the Meyers Farm PS basin. This master plan includes a future Roy Rogers PS that could receive flow from the Meyers Farm basin without pumping. At the time of construction of the future Roy Rogers PS, the Meyers Farm basin will be removed from the S Bull Mountain basin.

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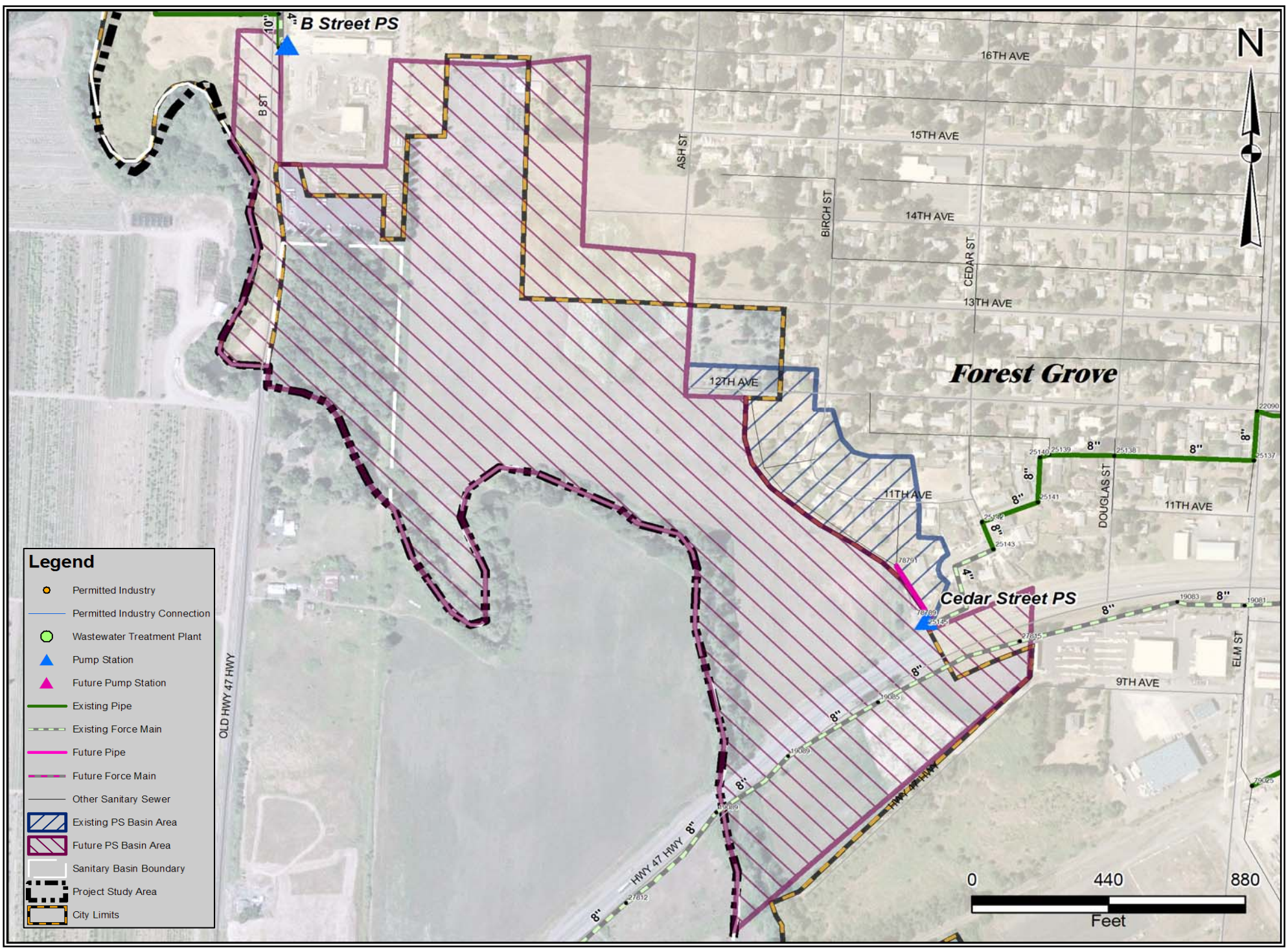
S Bull Mountain PS

Firm Capacity: 2.59 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 12 in
FM Length: 644 ft



Cedar Street PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	56	2.28	0.021	130	0.03	0.54	0.19	128	55	132	356	N
2015 Conditions[9]	57	18.20	0.167	4,900	0.58	10.30	-0.36	1,034	198	476	-699	Y
Buildout Conditions[9]	62	17.42	0.173	7,320	0.79	14.07	-0.58	1,072	734	1,762	-1,106	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.79	14.07	-0.58	1,072	N/A	N/A	N/A	N/A
Firm Capacity					0.22							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Cedar Street

Pump station and force main are adequately sized for buildout of the existing service area. However, a large growth area west of the Cedar Street PS will be tributary to the pump station and trigger the need for a replacement. Master planning assumptions result in flows exceeding the existing capacity before 2015; the actual timing of the improvements will be tied to the timing of growth in the new development area. A replacement pump station and force main are planned.

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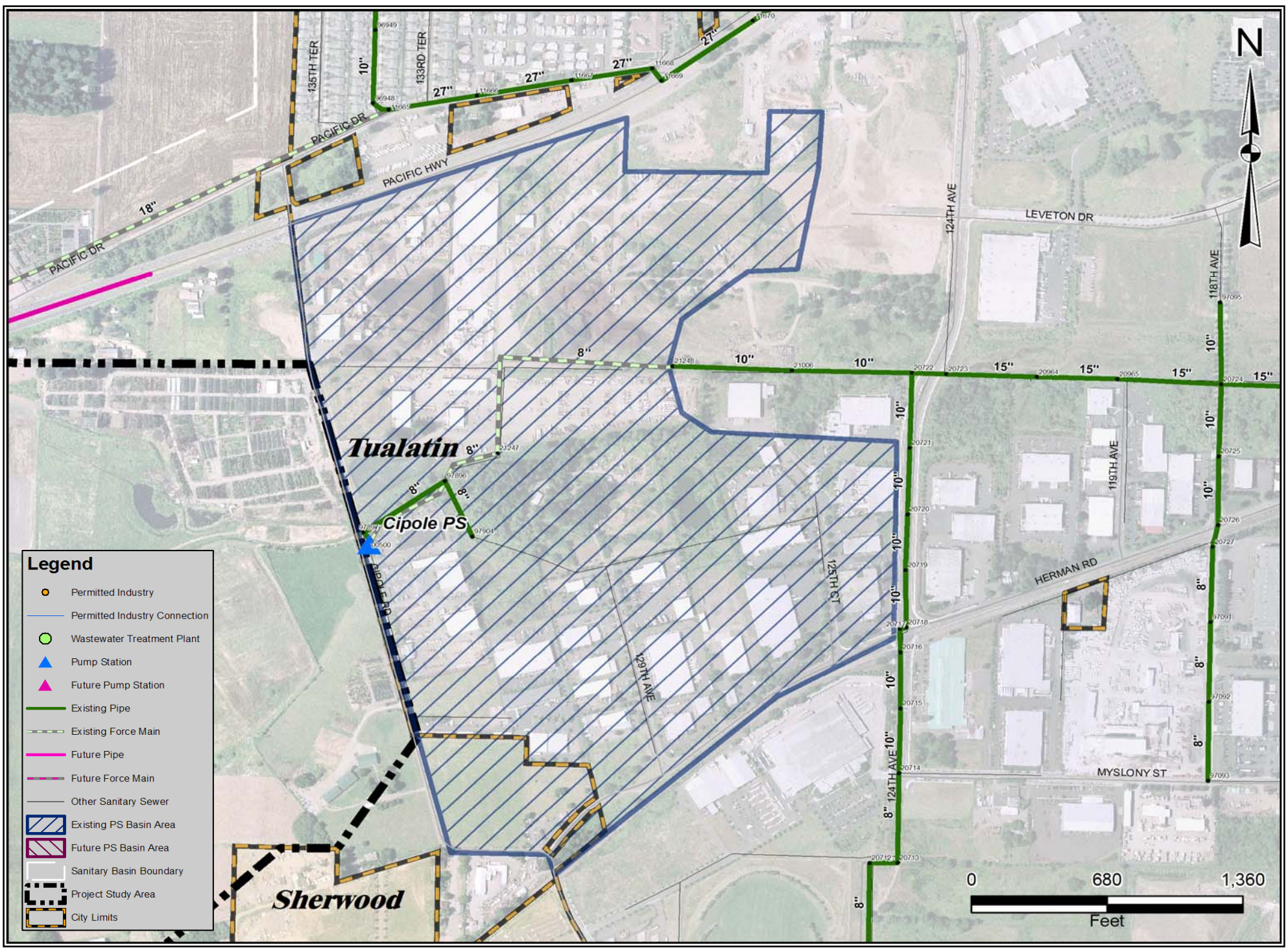
Cedar Street PS

Firm Capacity: 0.22 mgd
No. Pumps: 2
Basin: Forest Grove

FM Diameter: 4 in
FM Length: 405 ft



Cipole PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	157	1.36	0.03	90	0.41	1.81	0.15	213	0	0	287	N
2015 Conditions[9]	167	1.49	0.04	90	0.46	2.03	0.10	249	0	0	190	N
Buildout Conditions[9]	198	1.97	0.06	90	0.66	2.91	-0.10	389	0	0	-189	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.66	2.91	-0.10	389	N/A	N/A	N/A	N/A
Firm Capacity					0.56							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Cipole

Pump station and force main are adequately sized for flows anticipated through 2015. A pump station upgrade will be needed to accommodate the modeled buildout flows.

The basin is occupied by industrial and commercial uses, which tend to have wide ranging flow generation characteristics. Actual flows may be signficantly different than modeled flows. For planning purposes, it is assumed that replacement of pumping equipment and controls will be adequate to provide the necessary buildout capacity.

Cipole PS

Firm Capacity: 0.56 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 8 in
FM Length: 1,100 ft

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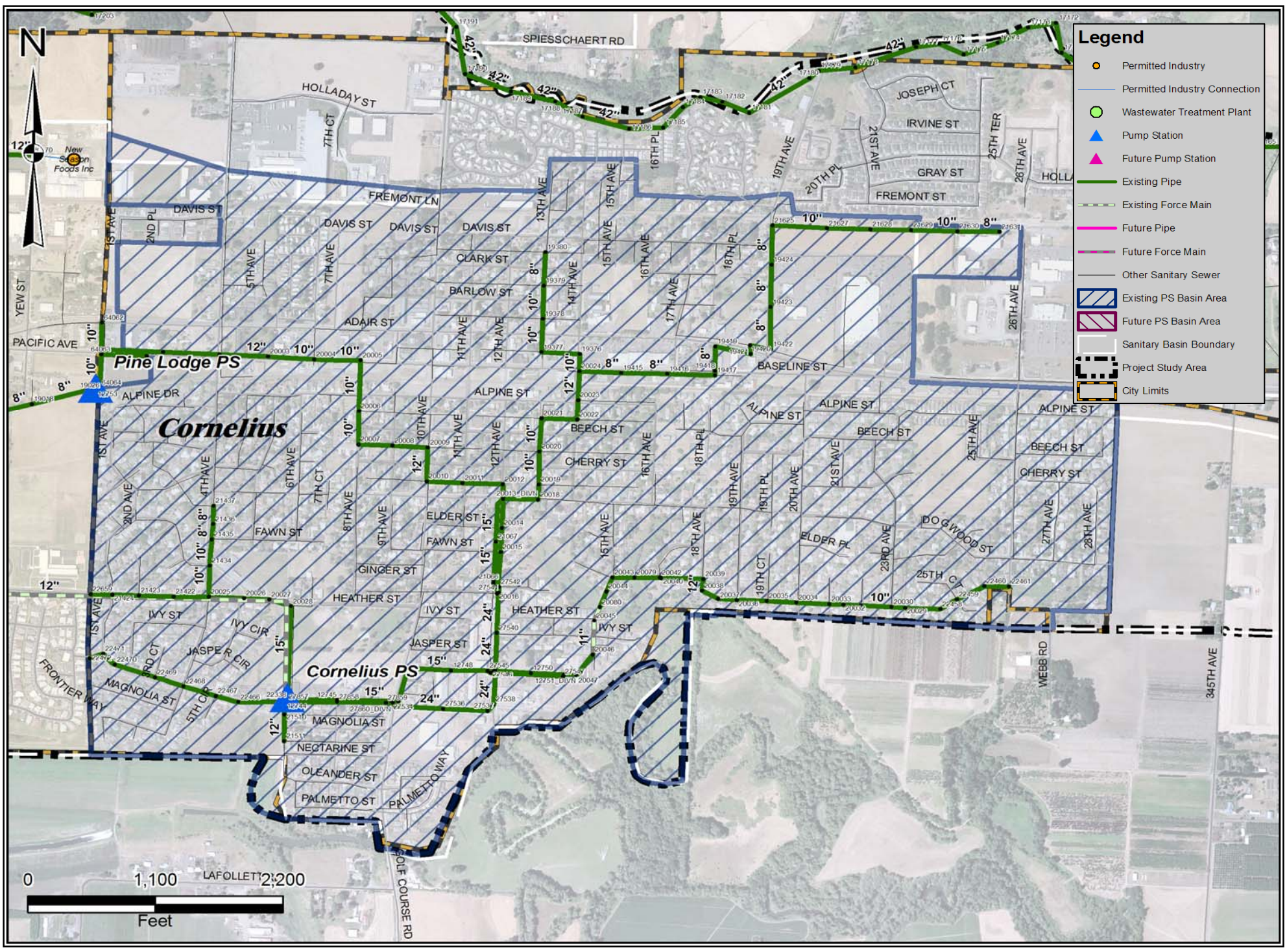

Cornelius PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	607	3.34	0.33	1,840	2.27	1.90	3.93	2,025	1,223	2,934	7,522	N
2015 Conditions[9]	616	3.89	0.39	1,860	2.28	1.90	3.92	2,393	1,273	3,054	7,503	N
Buildout Conditions[9]	697	5.72	0.64	1,870	2.68	2.24	3.51	3,989	2,010	4,825	6,730	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	2.68	2.24	3.51	3,989	N/A	N/A	N/A	N/A
Firm Capacity					6.20							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Cornelius

Pump station and force main are adequately sized for buildout.

Cornelius PS

Firm Capacity: 6.20 mgd
No. Pumps: 3
Basin: Forest Grove
FM Diameter: 12, 14 in parallel
FM Length: 3,617 ft

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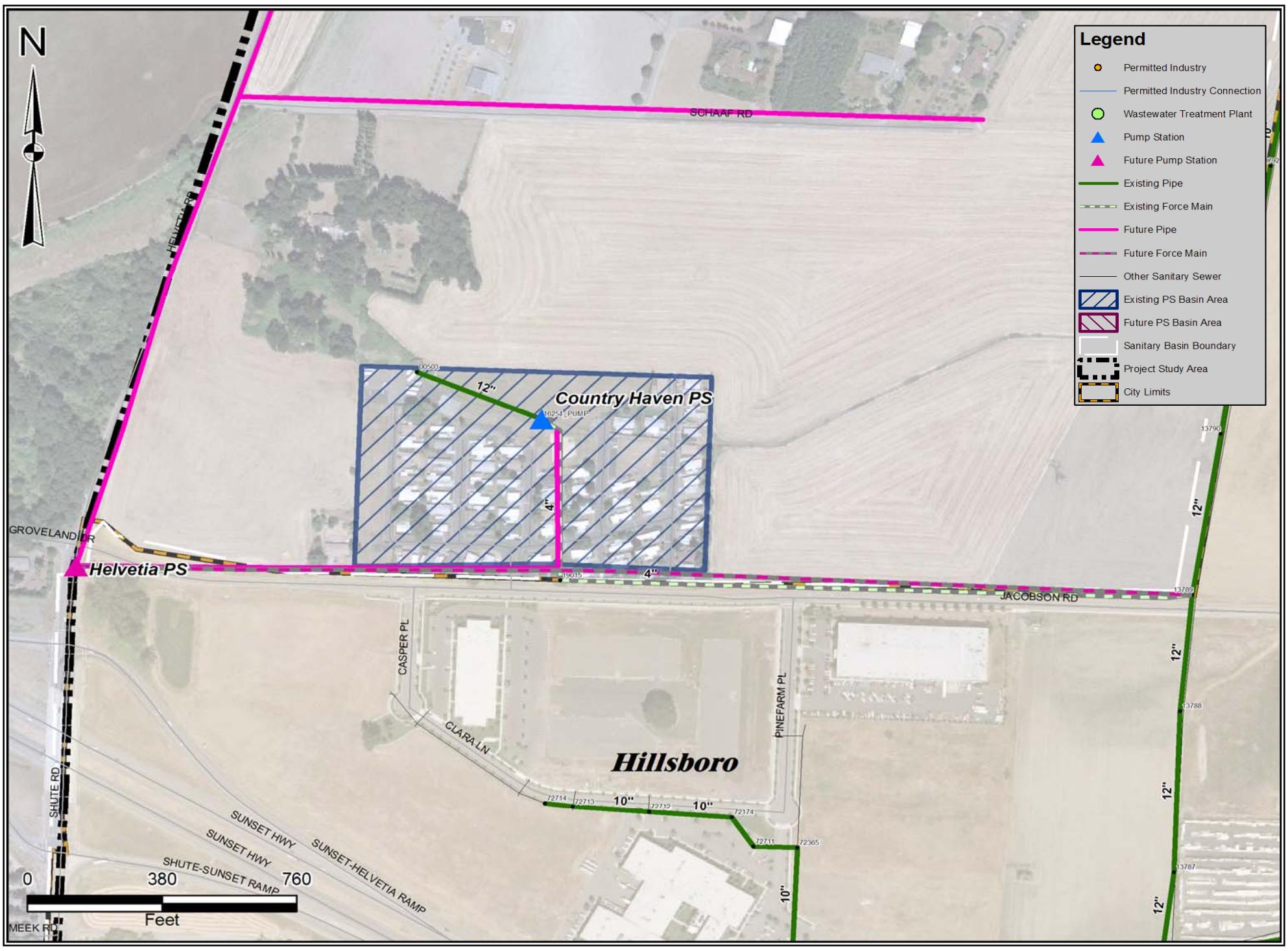

Country Haven PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	2	0.22	0.000	1,670	0.02	0.40	0.15	0	0	0	281	N
2015 Conditions[9]	10	23.49	0.037	1,670	0.05	0.85	0.12	227	161	386	233	N
Buildout Conditions[9]	19	23.49	0.073	1,670	0.10	1.70	0.07	454	322	773	141	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.10	1.70	0.07	454	N/A	N/A	N/A	N/A
Firm Capacity					0.17							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Country Haven

Pump station and force main are adequately sized for buildout. However, upon construction of the planned Helvetia PS, the Country Haven PS may be abadoned and the flows diverted by gravity to the new PS.

Country Haven PS

Firm Capacity: 0.17 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 4 in
FM Length: 2,276 ft

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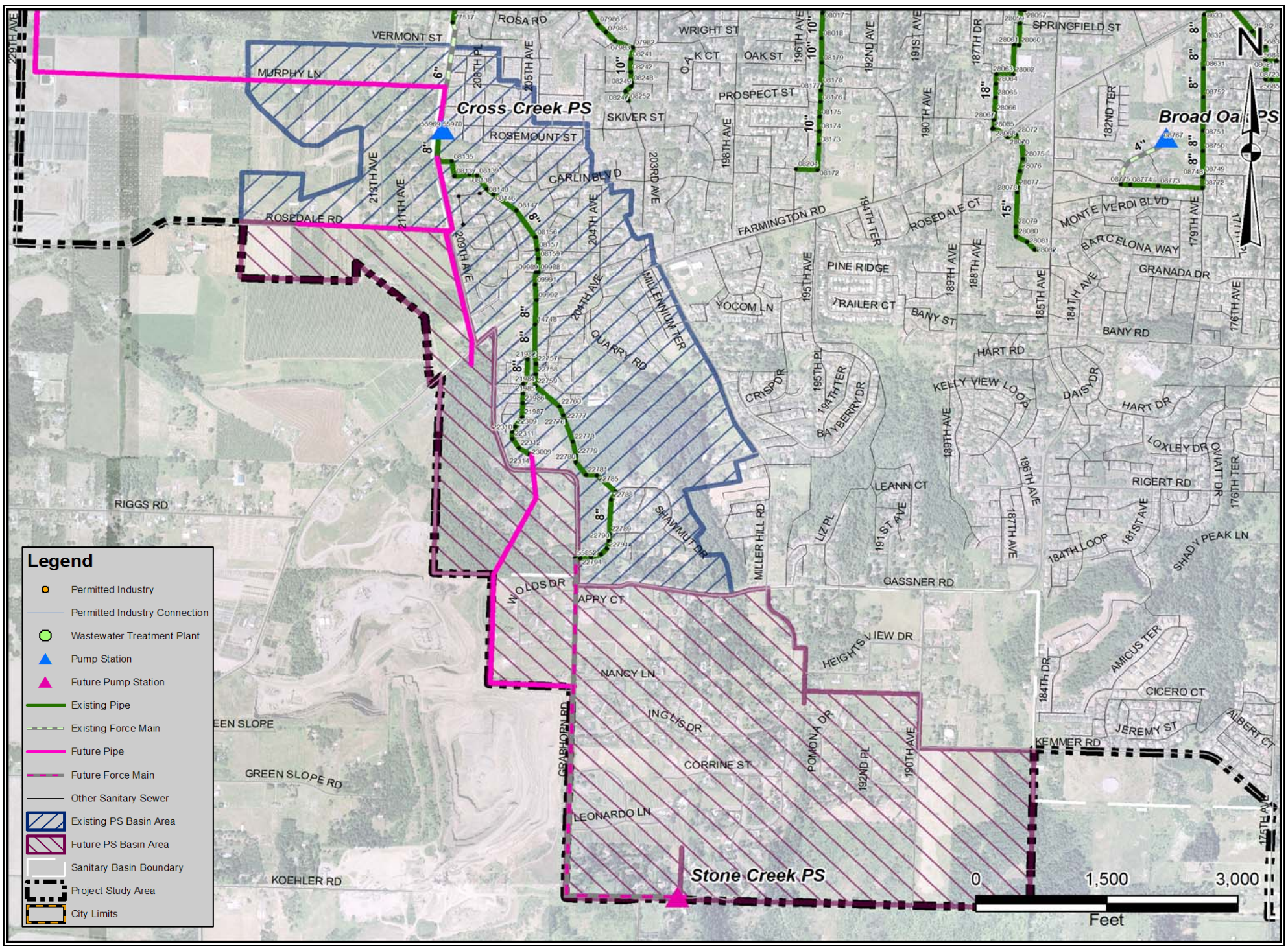

Cross Creek PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	522	2.81	0.24	890	1.15	5.09	0.29	1,468	992	2,381	562	N
2015 Conditions[9]	529	14.64	1.25	1,880	3.28	14.55	-1.84	7,748	5,486	13,165	-3,527	Y
Buildout Conditions[9]	793	16.28	2.08	3,300	5.81	25.76	-4.37	12,916	9,279	22,271	-8,370	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	13.67	60.62	-12.23	12,916	N/A	N/A	N/A	N/A
Firm Capacity					1.44							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Cross Creek

Significant growth is planned upstream of the pump station, exceeding existing capacity before 2015. Future flows include an area tributary to the future Stone Creek PS with a signficant number of existing homes not currently connected to the system. In lieu of a new pump station at the current location, flows can be diverted to the future Butternut PS when it is placed into service, via a new gravity trunk sewer.

District GIS reports a 6-inch force main, Other information provided by the District indicates 8-inch diameter, which is assumed for this plan.

Depending on when growth occurs upstream of Cross Creek PS, it may be necessary to upgrade the existing pump station before the new gravity trunk sewer and Butternut PS are constructed. For the purposes of this master plan, it is assumed that the pumps and controls will be replaced at Cross Creek to provide adequate capacity until the Butternut PS is in service.

Cross Creek PS

Firm Capacity: 1.44 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 8 in
FM Length: 1,369 ft

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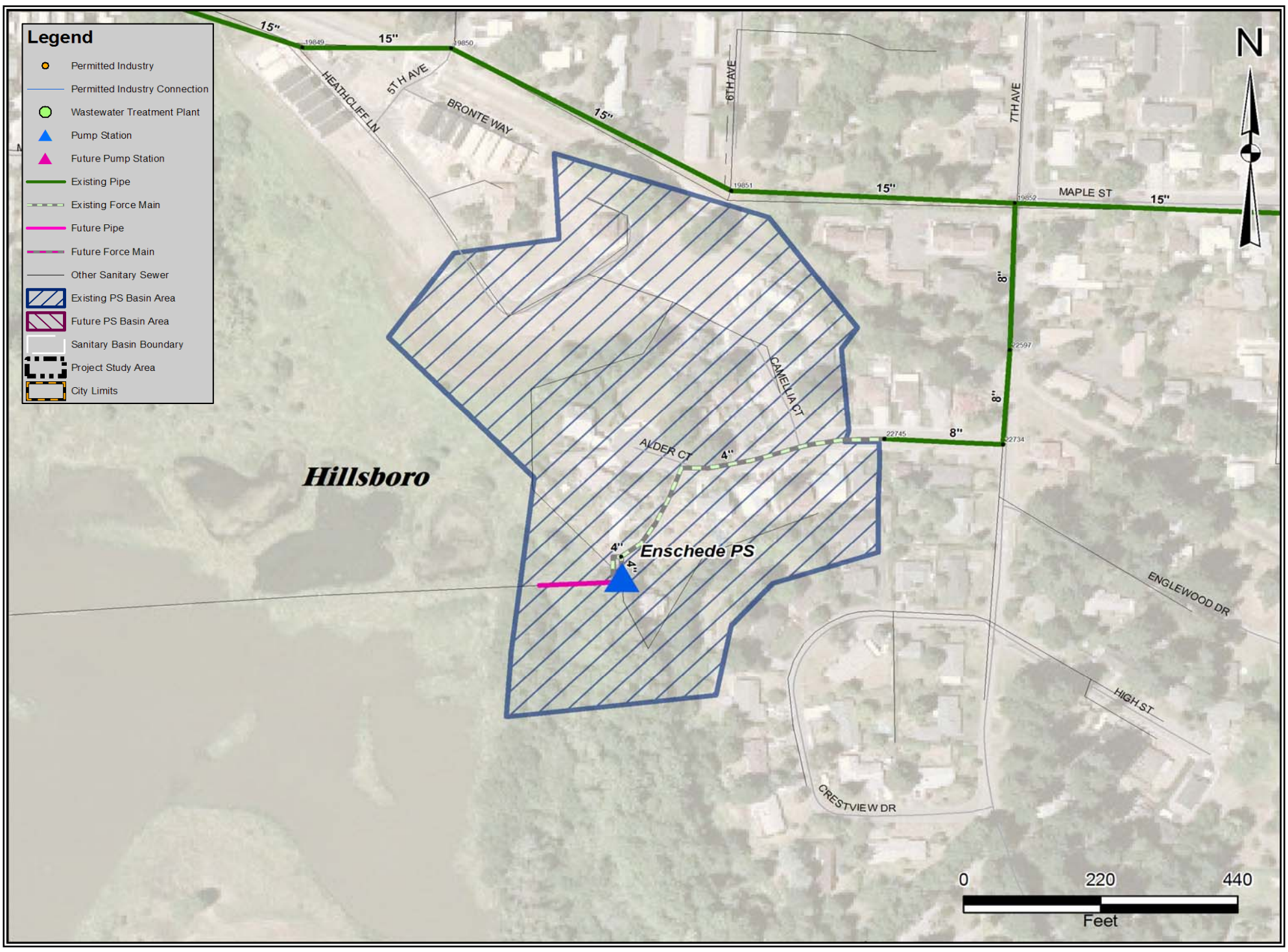

Enschede PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	50	0.53	0.004	2,680	0.04	0.69	0.16	27	27	64	298	N
2015 Conditions[9]	50	0.53	0.004	2,680	0.04	0.69	0.16	27	27	64	298	N
Buildout Conditions[9]	50	0.69	0.006	2,690	0.04	0.72	0.15	35	35	83	294	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.04	0.72	0.15	35	N/A	N/A	N/A	N/A
Firm Capacity					0.19							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Enschede

Pump station and force main are adequately sized for buildout.

Enschede PS

Firm Capacity: **0.19 mgd**
No. Pumps: **2**
Basin: **Hillsboro**
FM Diameter: **4 in**
FM Length: **592 ft**

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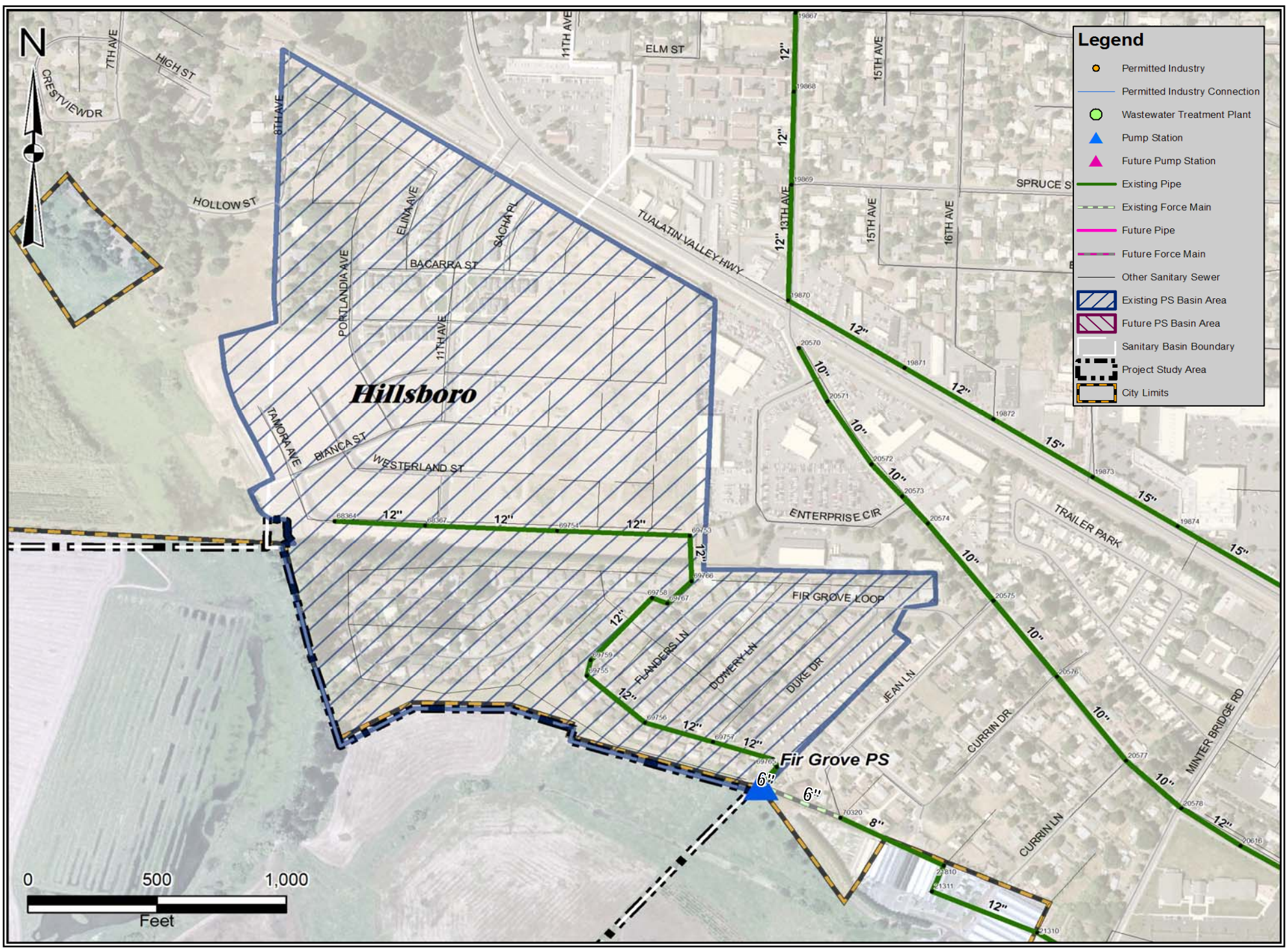

Fir Grove PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	73	9.05	0.11	1,810	0.34	2.68	0.40	665	644	1,546	766	N
2015 Conditions[9]	75	8.96	0.11	1,810	0.34	2.69	0.40	669	649	1,557	763	N
Buildout Conditions[9]	81	10.70	0.14	1,810	0.39	3.08	0.35	872	851	2,043	670	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.39	3.08	0.35	872	N/A	N/A	N/A	N/A
Firm Capacity					0.74							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Fir Grove

Pump station and force main are adequately sized for buildout.

District GIS reports a 4-inch force main, Other information provided by the District indicates 6-inch diameter, which is assumed for this plan.

Fir Grove PS

Firm Capacity: 0.74 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 6 in
FM Length: 333 ft

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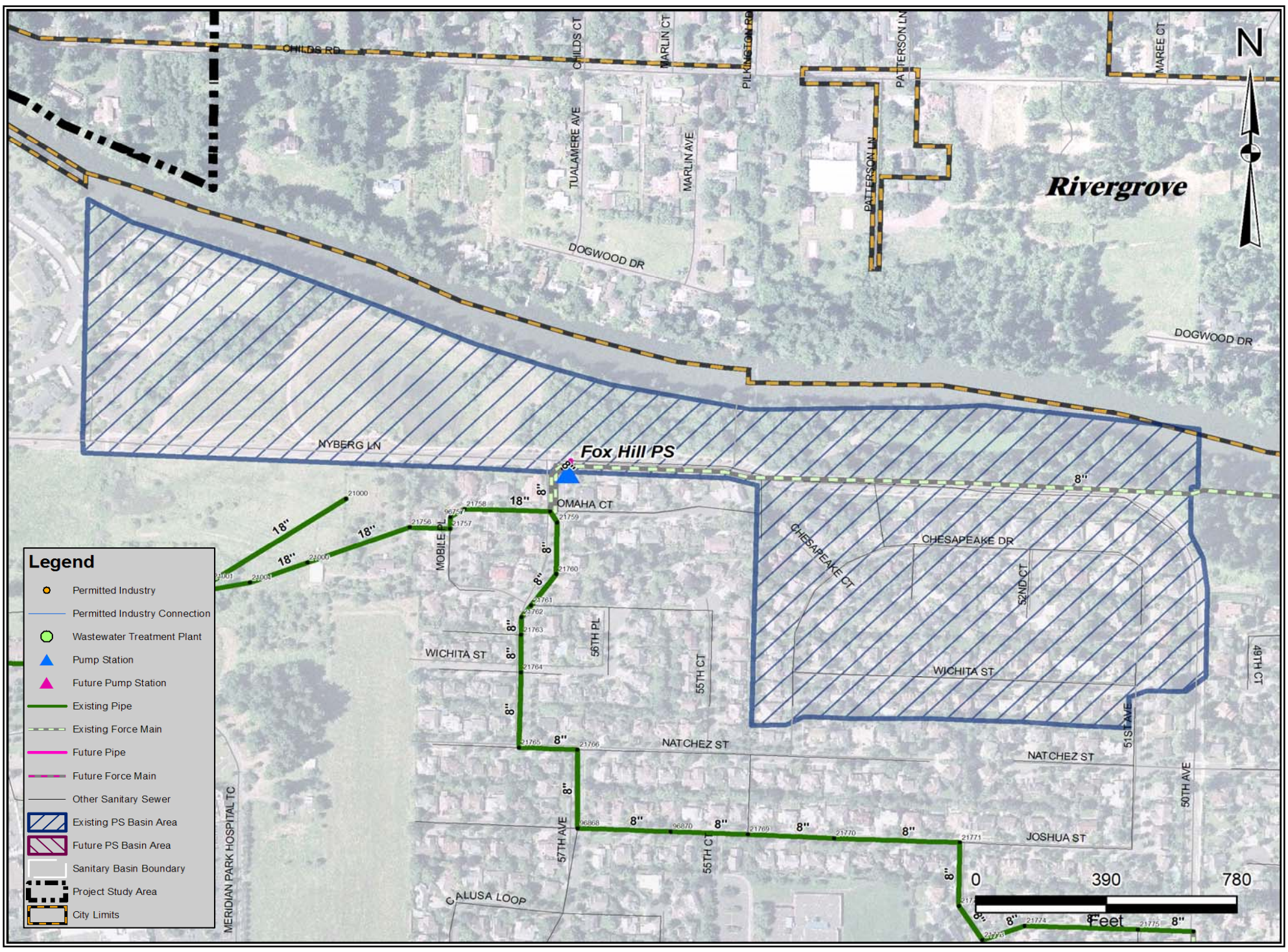

Fox Hill PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	42	3.68	0.03	1,590	0.14	1.08	0.15	155	155	373	288	N
2015 Conditions[9]	42	3.68	0.03	1,590	0.14	1.08	0.15	155	155	373	288	N
Buildout Conditions[9]	42	3.68	0.03	7,210	0.37	2.96	-0.09	155	155	373	-167	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.37	2.96	-0.09	155	N/A	N/A	N/A	N/A
Firm Capacity					0.29							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Fox Hill

Pump station and force main are adequately sized for buildout.

Fox Hill PS

Firm Capacity: 0.29 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 6 in
FM Length: 187 ft

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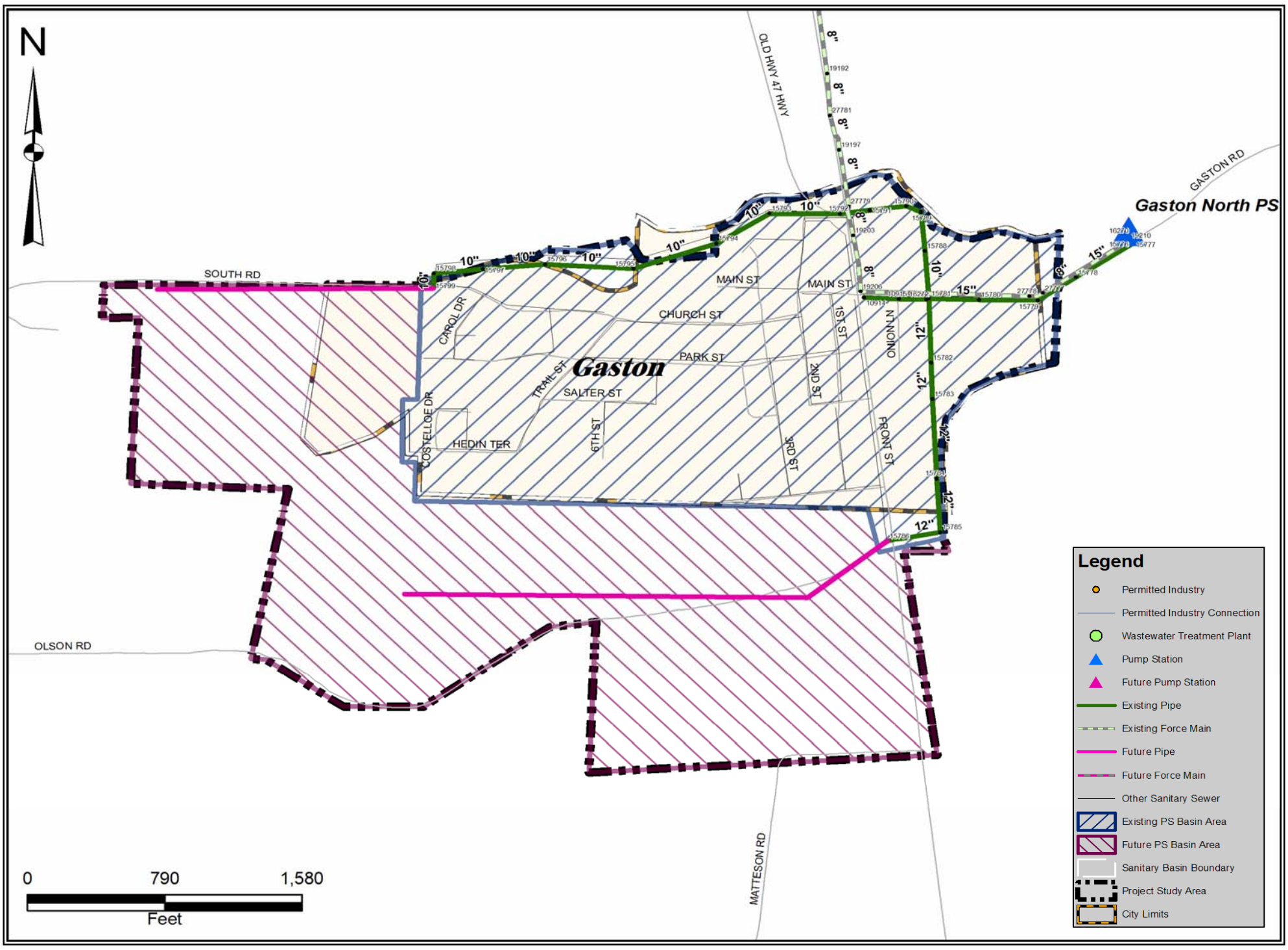

Gaston North PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	117	4.41	0.08	2,180	0.46	2.06	0.39	518	453	1,088	738	N
2015 Conditions[9]	117	8.18	0.15	2,250	0.62	2.75	0.23	960	459	1,101	441	N
Buildout Conditions[9]	160	21.89	0.56	4,480	2.09	9.27	-1.24	3,496	555	1,332	-2,378	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	2.09	9.27	-1.24	3,496	N/A	N/A	N/A	N/A
Firm Capacity					0.85							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Gaston North

Pump station and force main are marginally adequate for modeled 2015 flows, which are highly depedent on the amount of growth.

Modeled buildout flows will generate velocities over 9 ft/second, and substantial pumping pressures due to the force main length. The District plans to reduce I&I to avoid triggering the need for a second force main, which would represent a substantial additional cost.

A replacement pump station will be needed to accommodated buildout flows.

Gaston North PS

Firm Capacity: 0.85 mgd
No. Pumps: 2
Basin: Forest Grove
FM Diameter: 8 in
FM Length: 34,840 ft

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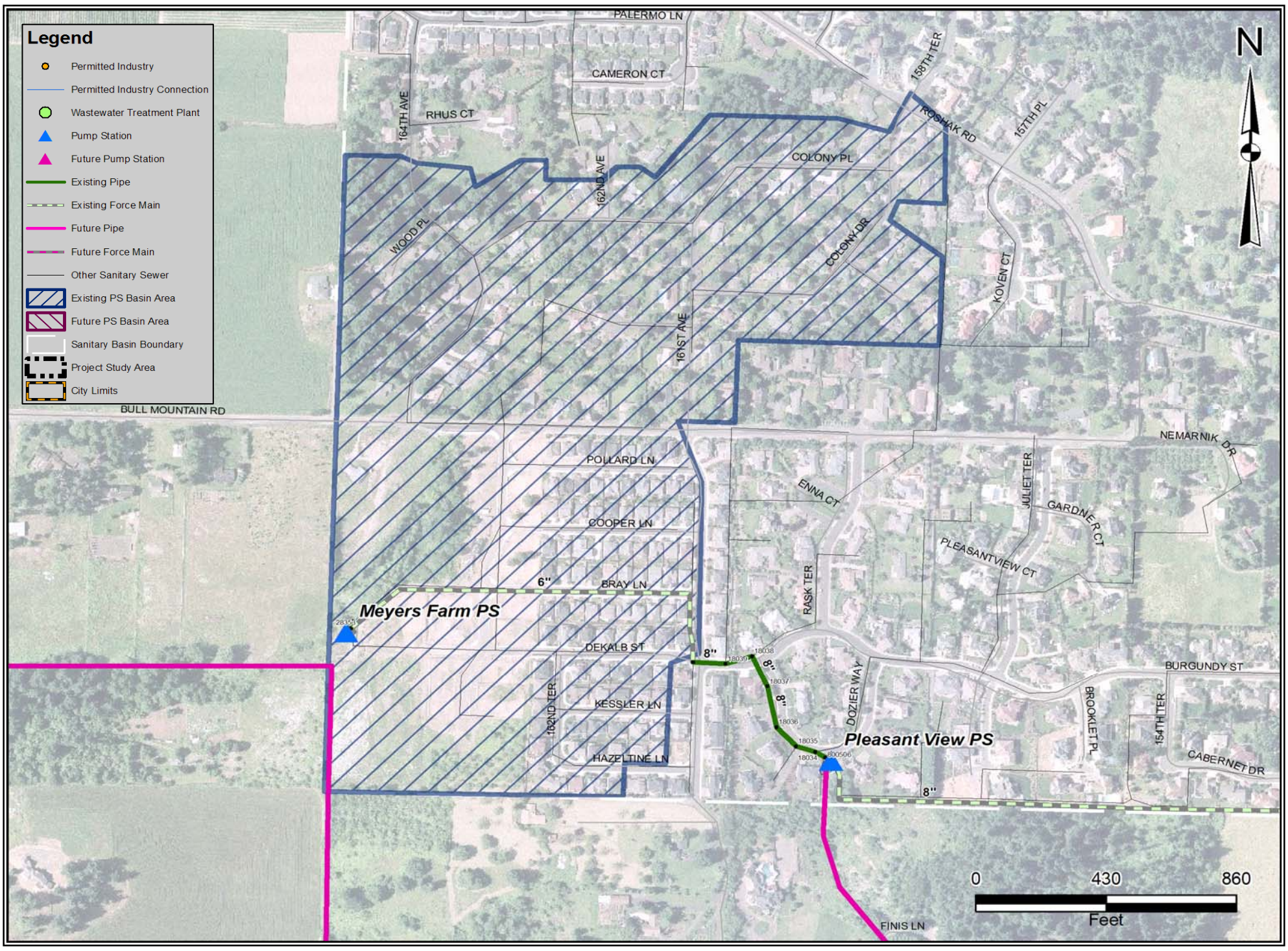

Meyers Farm PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	50	3.53	0.03	2,150	0.22	1.77	0.54	177	177	425	1,031	N
2015 Conditions[9]	50	3.56	0.03	2,170	0.29	2.29	0.47	177	177	425	906	N
Buildout Conditions[9]	62	3.62	0.04	2,170	0.37	2.92	0.39	223	223	534	752	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.37	2.92	0.39	223	N/A	N/A	N/A	N/A
Firm Capacity					0.76							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Meyers Farm

Pump station and force main are adequately sized for buildout. Upon construction of the future Roy Rogers PS and the planned future trunk sewer, it will be possible to decommission the Meyers Farm PS and serve the upstream basin by gravity to the Roy Rogers PS. This rerouting will reduce flow in the downstream Pleasant View PS and Bull Mountain PS.

Meyers Farm PS

Firm Capacity: 0.76 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 6 in
FM Length: 1,435 ft

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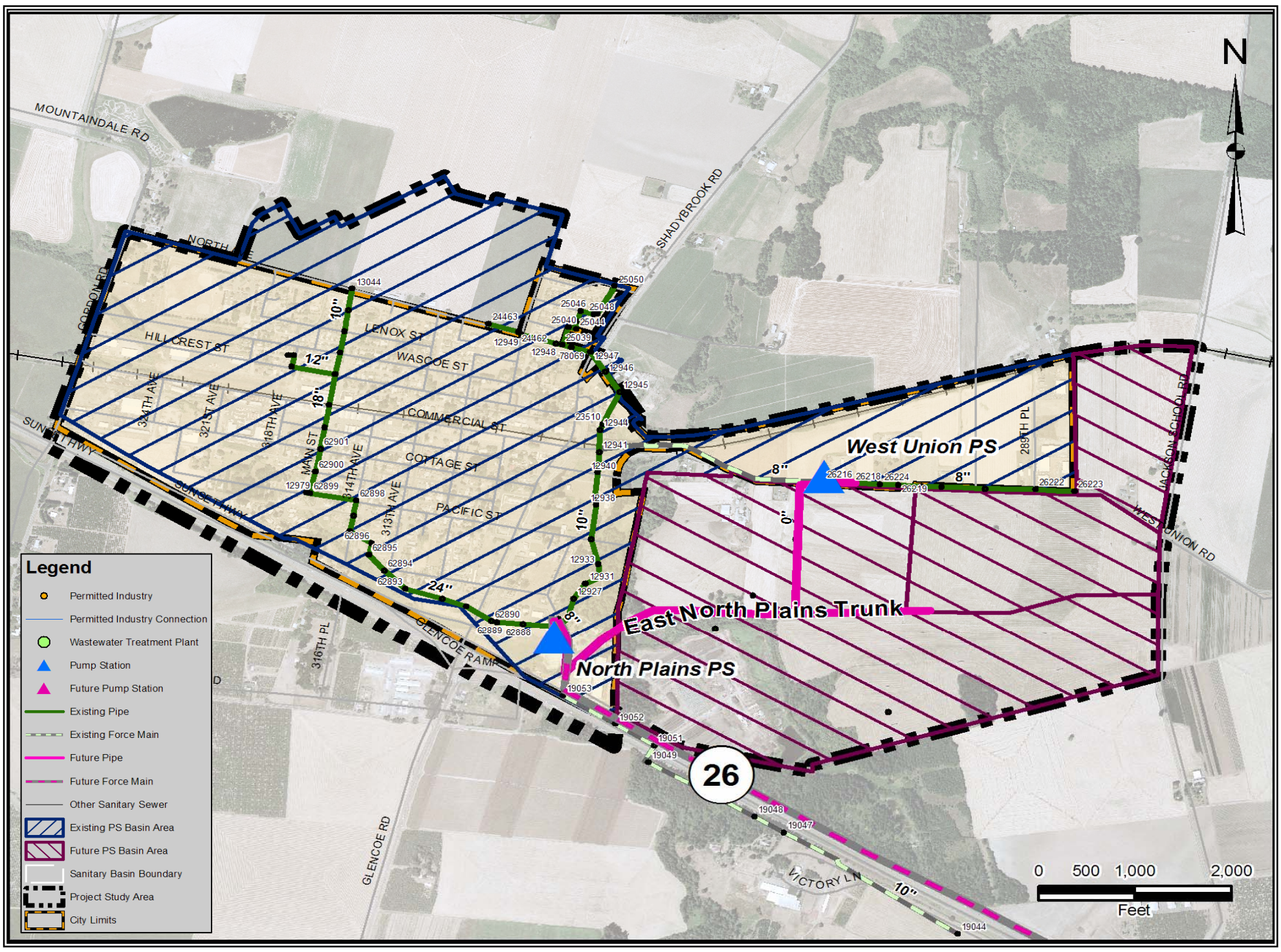

North Plains PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	469	4.97	0.38	1,780	1.48	6.56	-0.18	2,332	641	1,539	-351	Y
2015 Conditions[9]	469	14.99	1.13	1,940	2.95	13.09	-1.66	7,034	2,086	5,006	-3,174	Y
Buildout Conditions[9]	554	24.77	2.21	3,950	6.44	28.55	-5.14	13,729	3,476	8,342	-9,849	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	12.11	53.70	-10.81	13,729	N/A	N/A	N/A	N/A
Firm Capacity					1.30							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: North Plains

Pump station and force main are not adequately sized for anticipated flows. Existing peak flows may exceed the current firm capacity of the station. A pump station replacement is currently in design. As part of the preliminary design efforts, force main rerouting and sizing are also planned. For the purposes of this master plan, it is assumed the force main will be replaced with dual 20-inch force mains for redundancy and long-term capacity needs.

North Plains PS

Firm Capacity: 1.30 mgd
No. Pumps: 2
Basin: Hillsboro
FM Diameter: 8 in
FM Length: 18,967 ft

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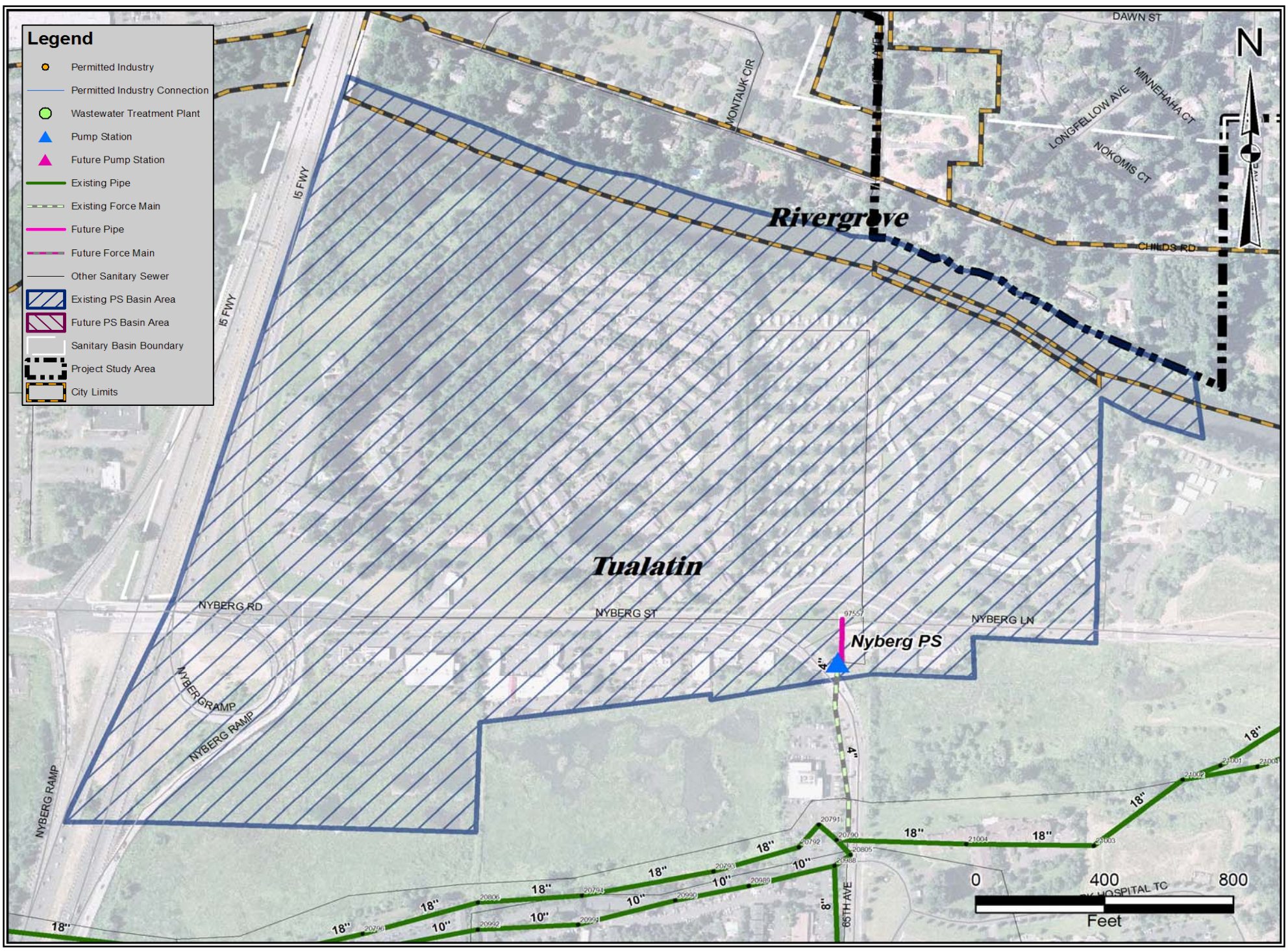

Nyberg PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	67	19.19	0.21	1,590	0.59	4.66	0.07	1,288	955	2,292	137	N
2015 Conditions[9]	70	18.34	0.21	1,590	0.59	4.66	0.07	1,288	955	2,292	137	N
Buildout Conditions[9]	87	15.79	0.22	1,590	0.61	4.78	0.06	1,368	957	2,297	107	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.61	4.78	0.06	1,368	N/A	N/A	N/A	N/A
Firm Capacity					0.66							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Nyberg

Pump station and force main are adequately sized for buildout. District pump station data indicates 6-inch FM, while GIS indicates 4-inch. Rated capacity of the station is adequate, so force main is assumed to be adequately sized.

Nyberg PS

Firm Capacity: 0.66 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 6 in
FM Length: 626 ft

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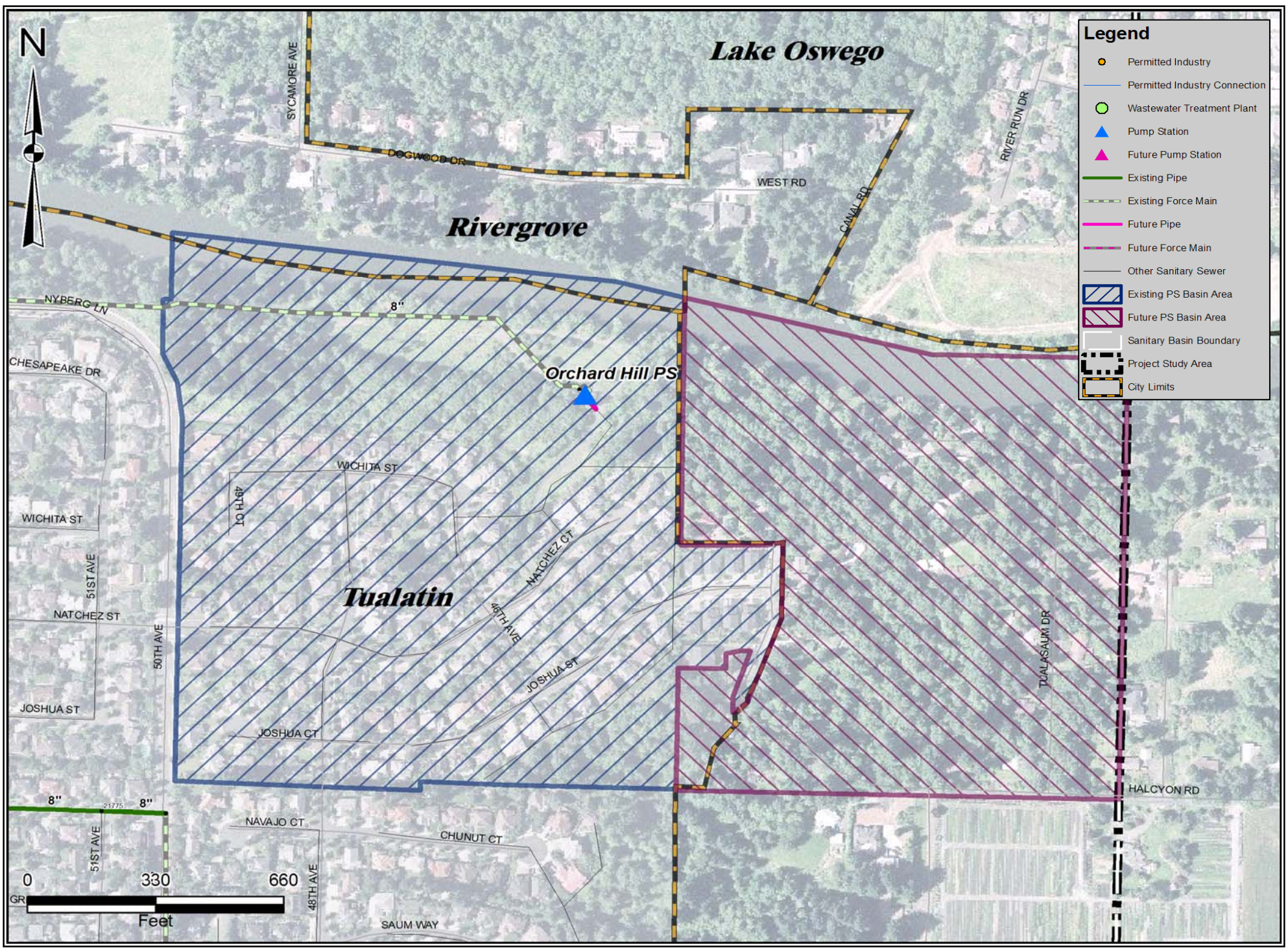

Orchard Hill PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	45	4.79	0.03	1,040	0.15	0.64	0.50	215	215	516	963	N
2015 Conditions[9]	46	12.76	0.09	1,610	0.28	1.26	0.36	586	481	1,155	696	N
Buildout Conditions[9]	64	11.72	0.12	2,760	0.43	1.90	0.22	746	611	1,467	420	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.43	1.90	0.22	746	N/A	N/A	N/A	N/A
Firm Capacity					0.65							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Orchard Hill

Pump station and force main are adequately sized for buildout.

Orchard Hill PS

Firm Capacity: 0.65 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 8 in
FM Length: 3,252 ft

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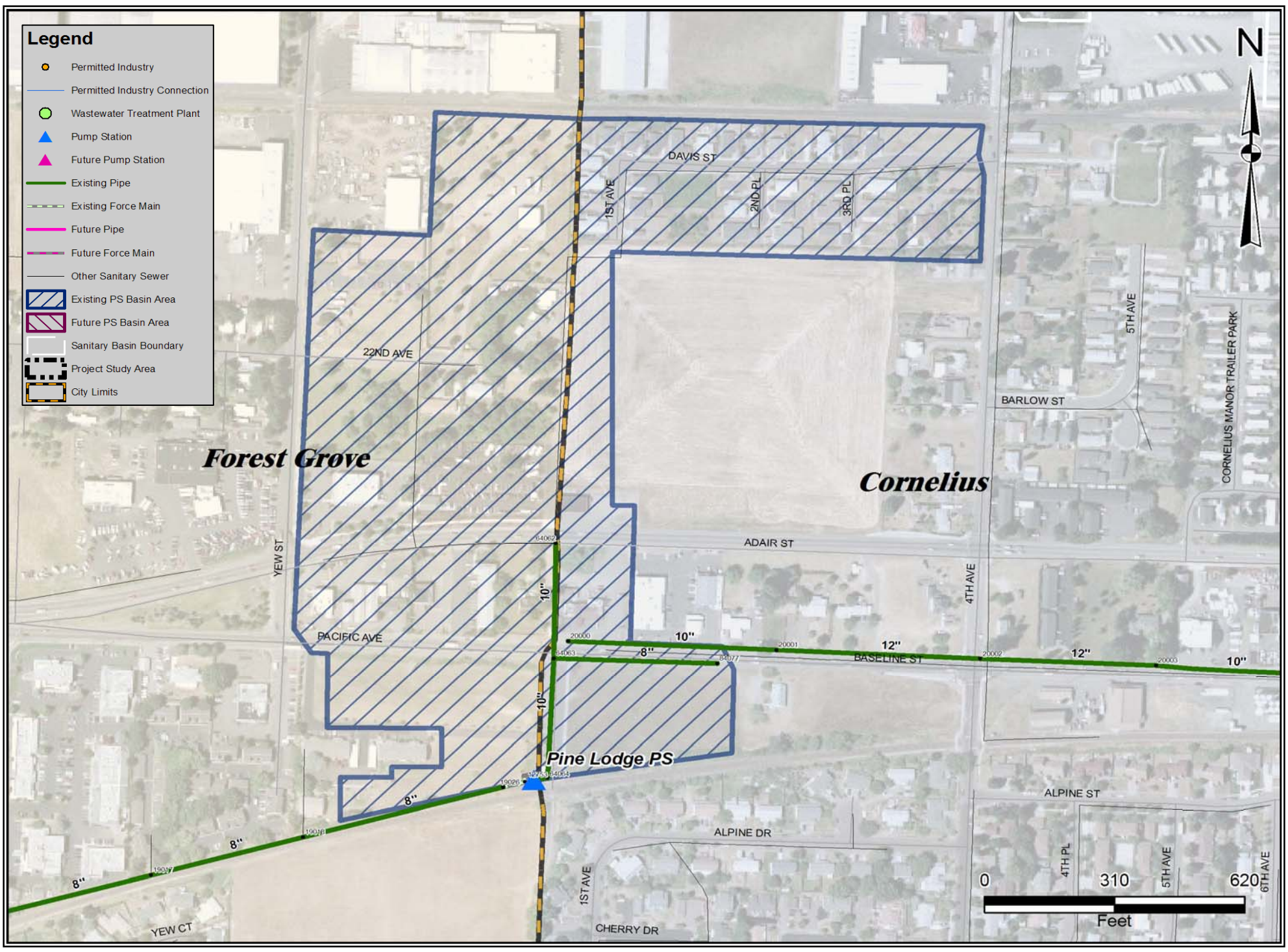

Pine Lodge PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	17	12.69	0.03	5,230	0.24	1.88	0.23	217	77	184	442	N
2015 Conditions[9]	23	18.35	0.07	5,230	0.29	2.30	0.18	426	77	184	341	N
Buildout Conditions[9]	25	18.69	0.08	5,230	0.30	2.39	0.17	471	77	184	319	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.30	2.39	0.17	471	N/A	N/A	N/A	N/A
Firm Capacity					0.47							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Pine Lodge

Pump station and force main are adequately sized for buildout.

Pine Lodge PS

Firm Capacity: 0.47 mgd
No. Pumps: 3
Basin: Forest Grove
FM Diameter: 6 in
FM Length: 74 ft

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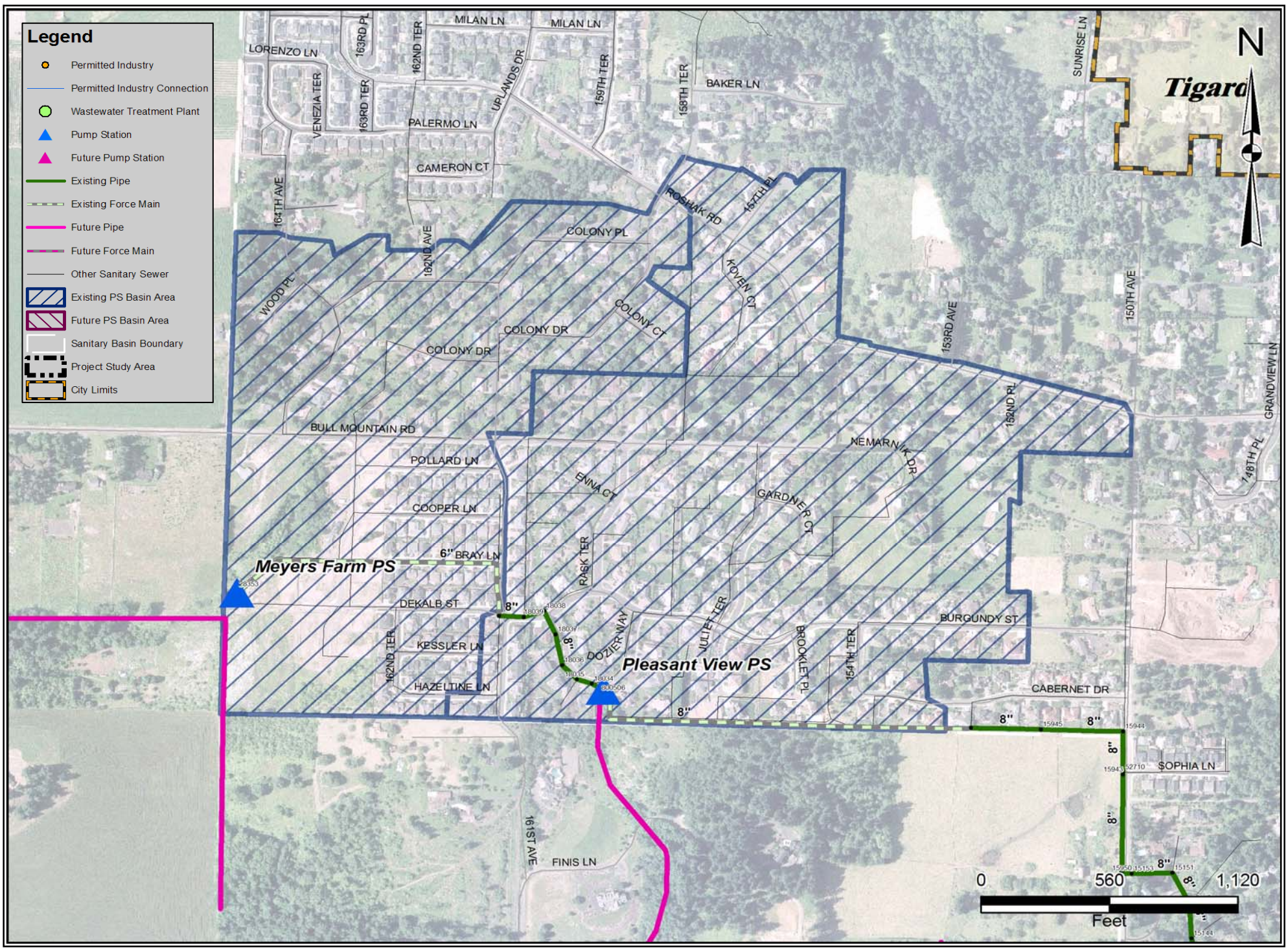

Pleasant View PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	91	3.53	0.05	2,150	0.56	2.49	0.01	322	322	773	28	N
2015 Conditions[9]	90	3.57	0.05	2,180	0.63	1.49	-0.05	322	322	773	-103	Y
Buildout Conditions[9]	91	3.57	0.05	2,180	0.71	1.50	-0.13	324	324	778	-257	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.71	1.50	-0.13	324	N/A	N/A	N/A	N/A
Firm Capacity					0.58							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Pleasant View

Existing flows are at or near the current capacity. A capacity upgrade is needed to accommodate infill development, which could occur in the area directly tributary to the pump station, or in the Meyers Farm PS basin. It is assumed this upgrade can be accomplished by replacing pumps and controls.

Eventually, the upstream Meyers Farm basin will be rerouted to the future Roy Rogers PS, reducing flows at Pleasant View. Furthermore, upon construction of planned gravity sewers south from the Pleasant View PS location to Bull Mountain PS, the Pleasant View PS will be decommissioned.

Pleasant View PS

Firm Capacity: 0.58 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 8 in
FM Length: 1,754 ft

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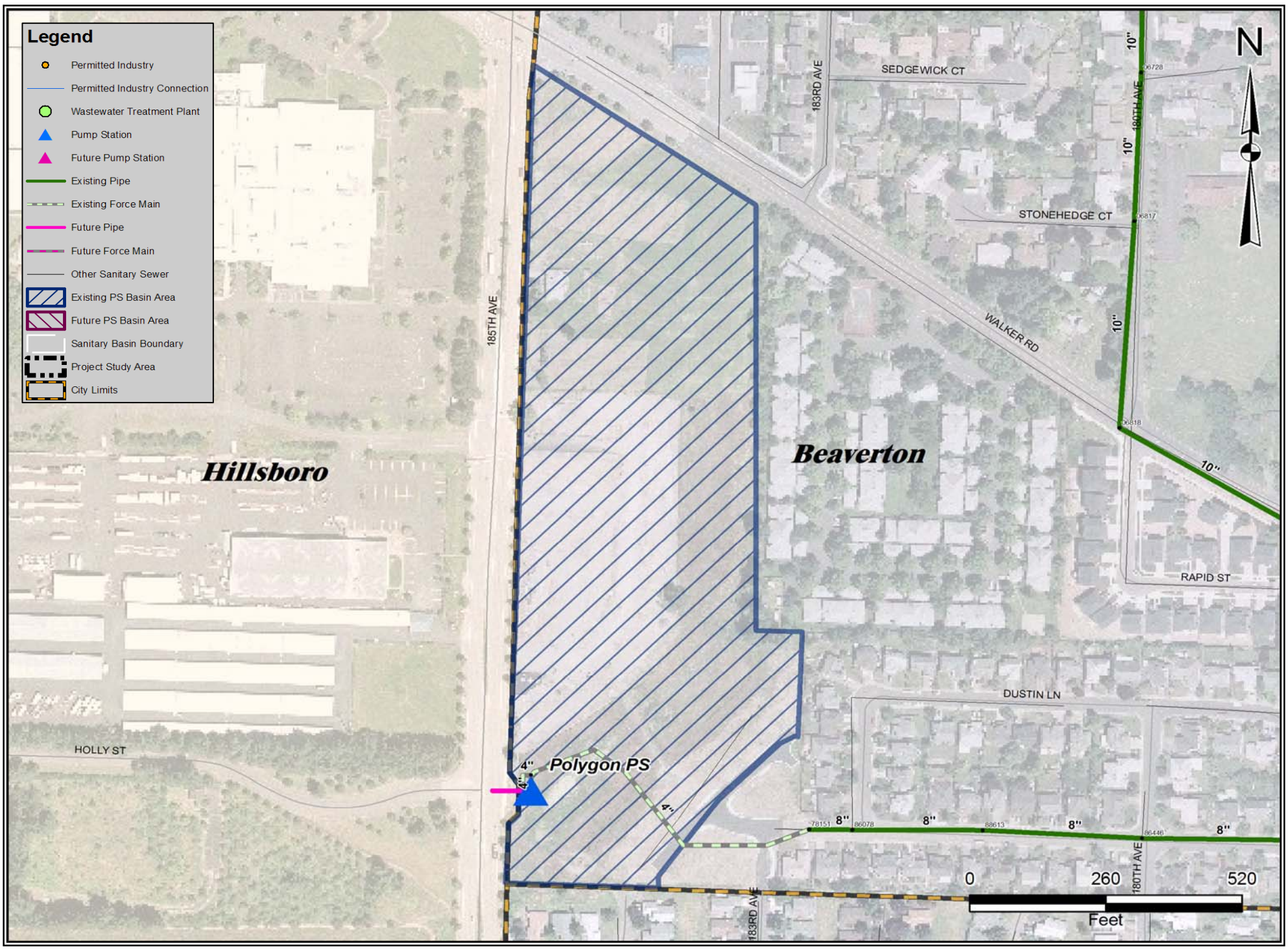

Polygon PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	0.1	12.50	0.00	930	0.05	0.84	0.24	1	1	3	461	N
2015 Conditions[9]	1.1	25.31	0.00	930	0.06	1.01	0.23	29	29	70	443	N
Buildout Conditions[9]	4.9	26.10	0.02	930	0.09	1.62	0.20	128	128	308	377	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.09	1.62	0.20	128	N/A	N/A	N/A	N/A
Firm Capacity					0.29							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Polygon

Pump station and force main are adequately sized for buildout.

Polygon PS

Firm Capacity: **0.29 mgd**
No. Pumps: **2**
Basin: **Rock Creek**
FM Diameter: **4 in**
FM Length: **676 ft**

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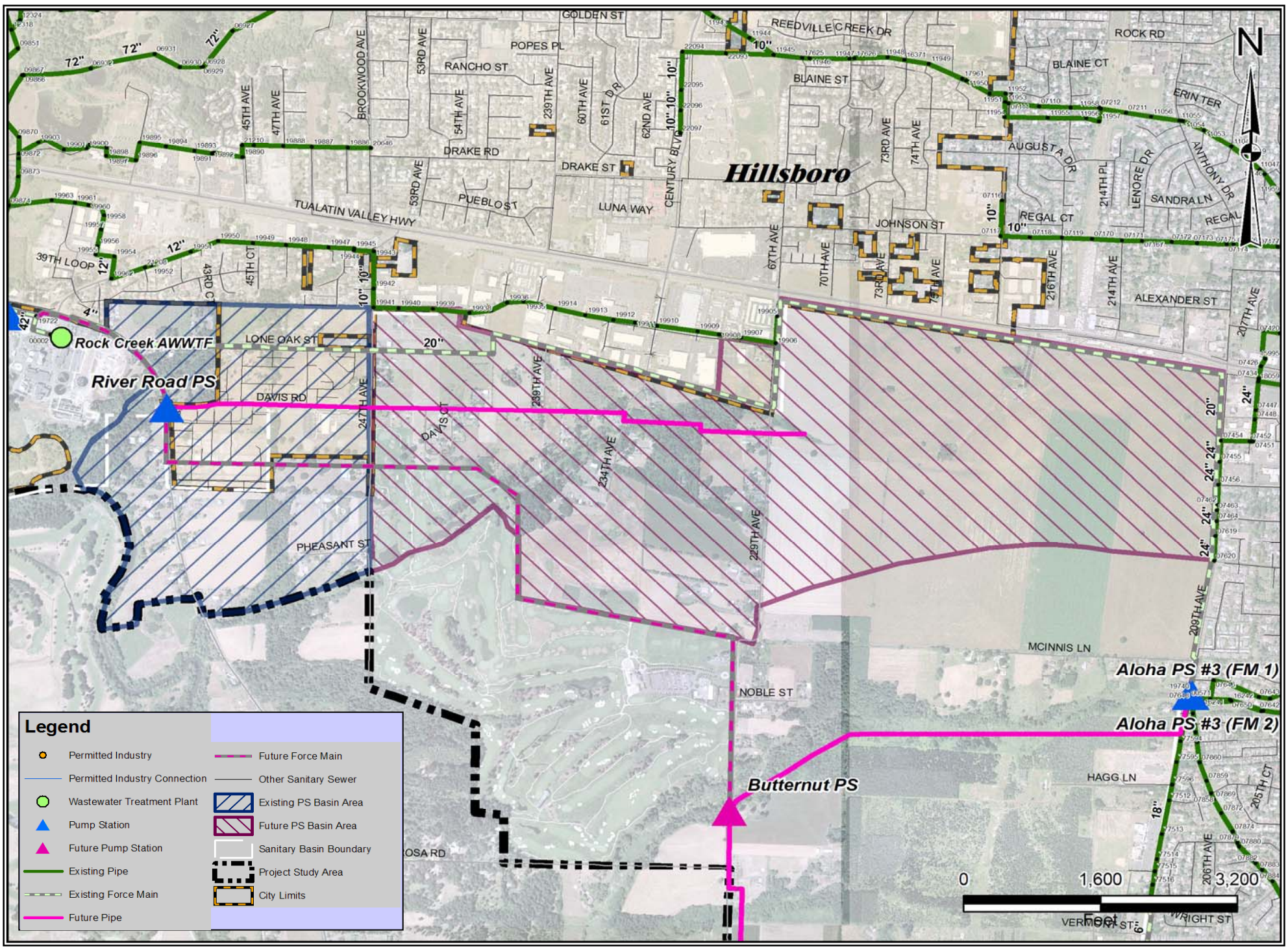

River Road PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	174	2.17	0.06	950	0.66	1.87	0.28	378	233	559	531	N
2015 Conditions[9]	417	19.58	1.31	2,240	4.26	12.08	-3.32	8,159	6,854	16,450	-6,364	Y
Buildout Conditions[9]	728	17.22	2.02	4,430	6.93	19.71	-5.99	12,531	12,041	28,898	-11,476	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	6.93	19.71	-5.99	12,531	N/A	N/A	N/A	N/A
Firm Capacity				(Previous)	0.94							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: River Road

Pump station is designed for phased expansion. Initial firm capacity was not adequate for 2015 modeled flows. A capacity upgrade has recently been constructed.

For planning purposes, it is assumed a parallel 15-inch force main will be constructed for 2015 flows, and a second 15-inch parallel force main will be constructed after 2015 for buildout flows.

Future flows do not include areas of South Hillsboro that will be tributary to the future Butternut PS. The Butternut force main will convey flows directly to the Rock Creek AWWTF.

River Road PS

Firm Capacity: 0.94 mgd (Previous)
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 10 in
FM Length: 2,157 ft

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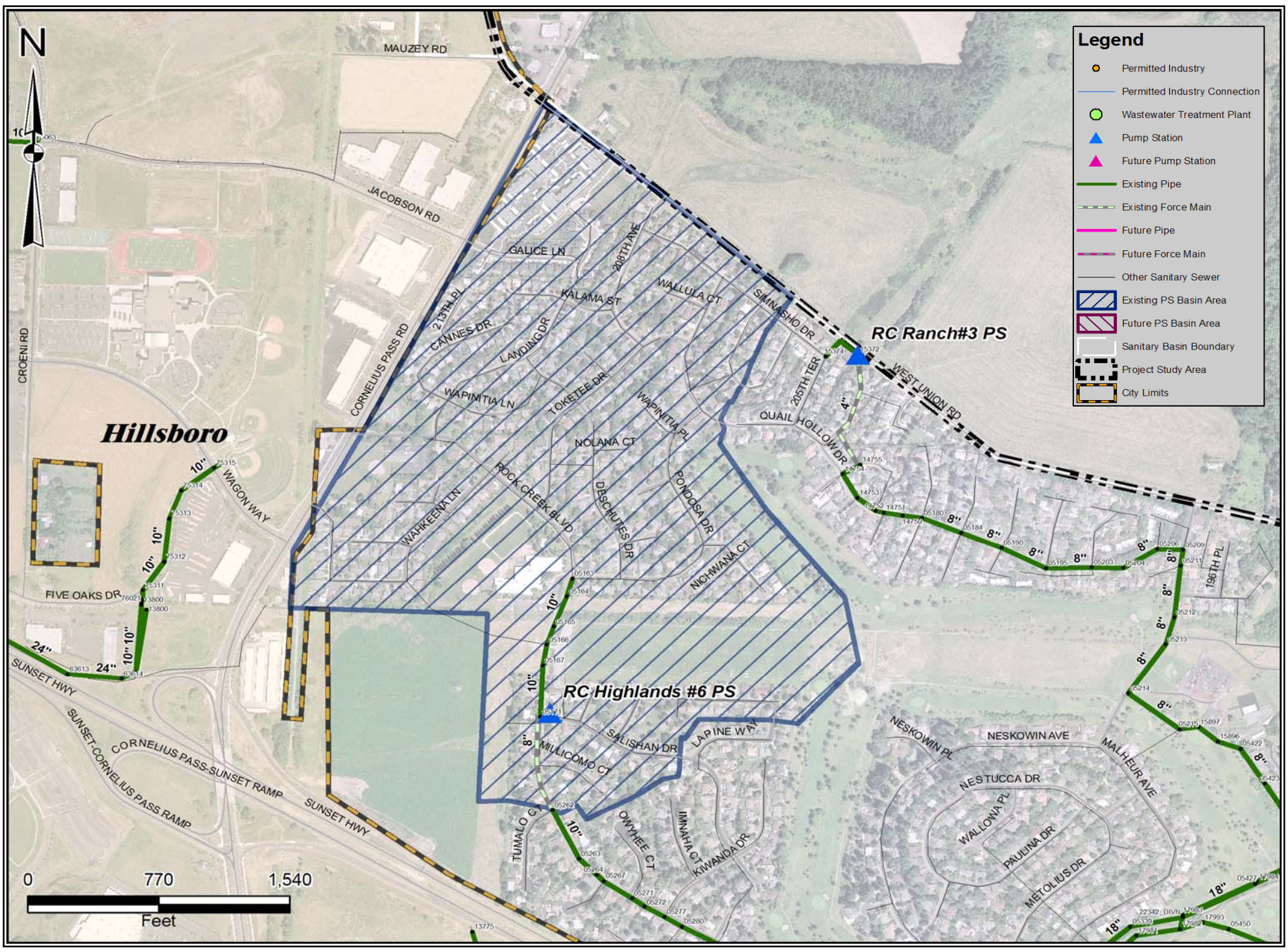

RC Highlands #6 PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	135	3.14	0.07	2,680	0.61	2.72	-0.04	423	226	542	-73	Y
2015 Conditions[9]	135	3.22	0.07	2,680	0.62	2.73	-0.04	436	226	542	-77	Y
Buildout Conditions[9]	149	5.00	0.12	2,680	0.68	3.00	-0.10	747	242	582	-191	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.68	3.00	-0.10	747	N/A	N/A	N/A	N/A
Firm Capacity					0.58							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: RC Highlands #6
(aka, Rock Creek Ranch PS)

Existing modeled flows slightly exceed rated capacity. The service area is nearly built out, and very little increase in flow is anticipated through buildout.

Actual flows should be verified from pumping records to determine whether or not the firm capacity of the pump station is actually exceeded. For the purposes of this master plan, it is assumed that the pump station is adequate, or that a small increase in capacity can be achieved when pumps are next replaced for maintenance, if necessary.

RC Highlands #6 PS

Firm Capacity: 0.58 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 8 in
FM Length: 699 ft

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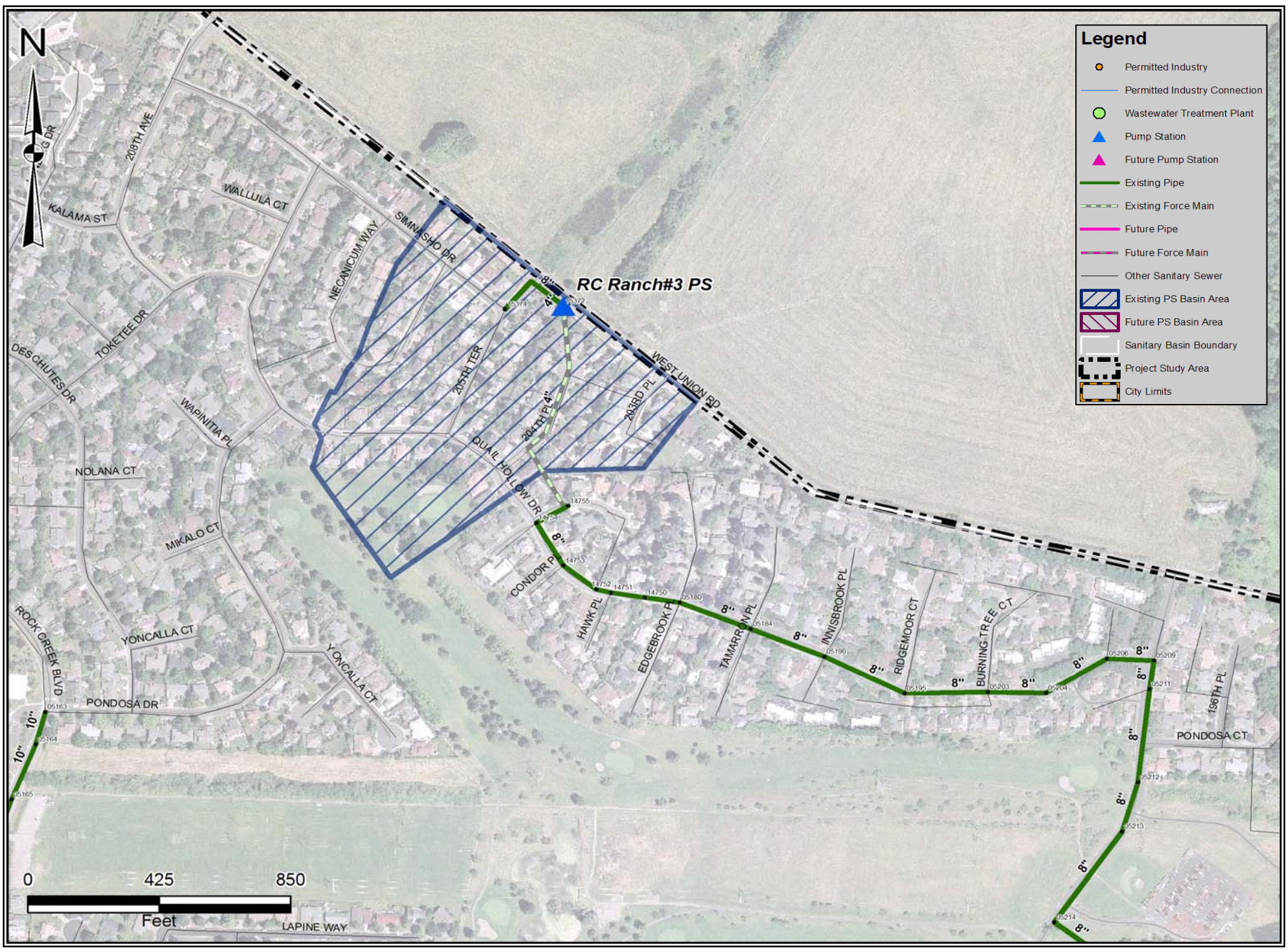

RC Ranch#3 PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	14	2.85	0.01	1,070	0.03	0.60	0.11	41	14	33	212	N
2015 Conditions[9]	14	2.85	0.01	1,070	0.03	0.60	0.11	41	14	33	212	N
Buildout Conditions[9]	14	2.85	0.01	1,070	0.03	0.60	0.11	41	14	33	212	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.03	0.60	0.11	41	N/A	N/A	N/A	N/A
Firm Capacity					0.14							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: RC Ranch#3

Pump station and force main are adequately sized for buildout.

RC Ranch#3 PS

Firm Capacity: 0.14 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 4 in
FM Length: 764 ft

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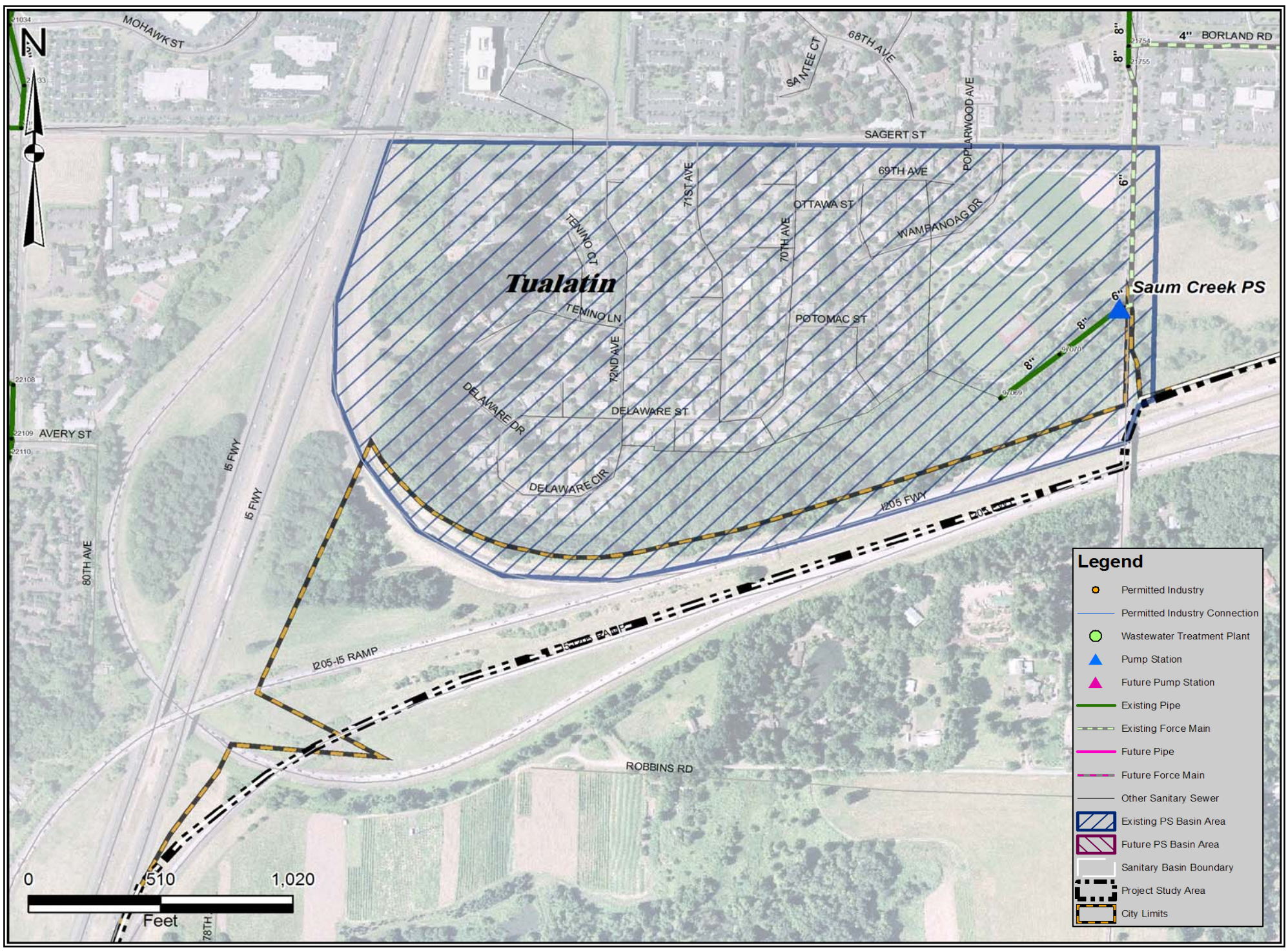

Saum Creek PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	70	5.18	0.06	1,590	0.29	2.26	0.16	363	363	871	307	N
2015 Conditions[9]	70	5.18	0.06	1,590	0.29	2.26	0.16	363	363	871	307	N
Buildout Conditions[9]	70	5.18	0.06	1,590	0.29	2.26	0.16	363	363	871	306	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.29	2.26	0.16	363	N/A	N/A	N/A	N/A
Firm Capacity					0.45							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Saum Creek

Pump station and force main are adequately sized for buildout.

Saum Creek PS

Firm Capacity: 0.45 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 6 in
FM Length: 1,052 ft

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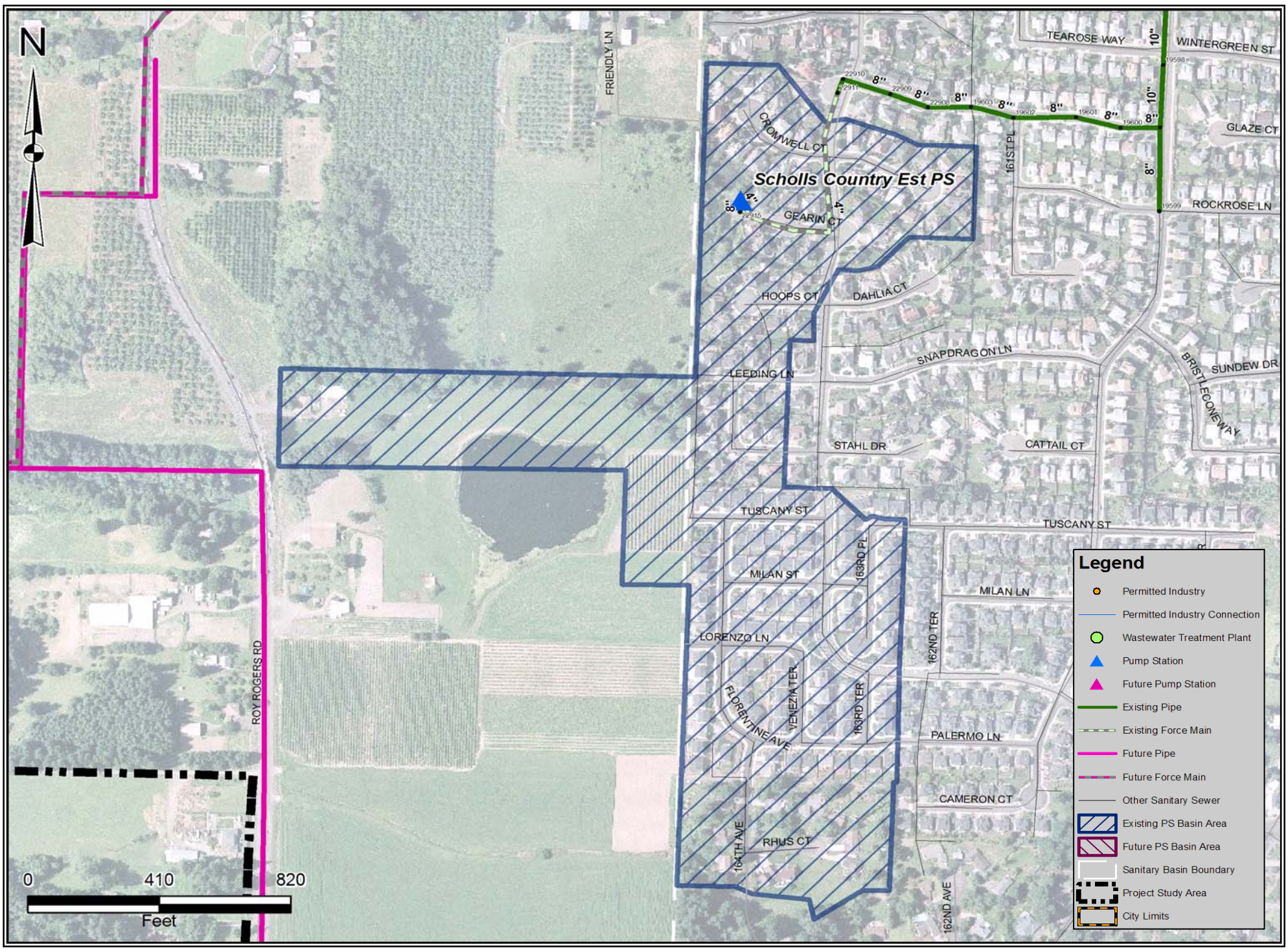

Scholls Country Est PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	38	1.68	0.01	2,150	0.12	2.10	0.10	64	64	155	187	N
2015 Conditions[9]	38	8.55	0.05	2,150	0.18	3.19	0.04	327	253	608	70	N
Buildout Conditions[9]	49	11.63	0.09	2,150	0.24	4.19	-0.02	568	427	1,024	-39	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.24	4.19	-0.02	568	N/A	N/A	N/A	N/A
Firm Capacity					0.22							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Scholls Country Est

Pump station and force main are adequately sized for 2015 and marginally inadequate at buildout. A portion of the currently identified service area may be served by the future Roy Rogers PS, in which case the existing Scholls Country Estates would have adequate capacity for buildout. No improvement is planned for the purposes of this master plan.

Scholls Country Est PS

Firm Capacity: 0.22 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 4 in
FM Length: 798 ft

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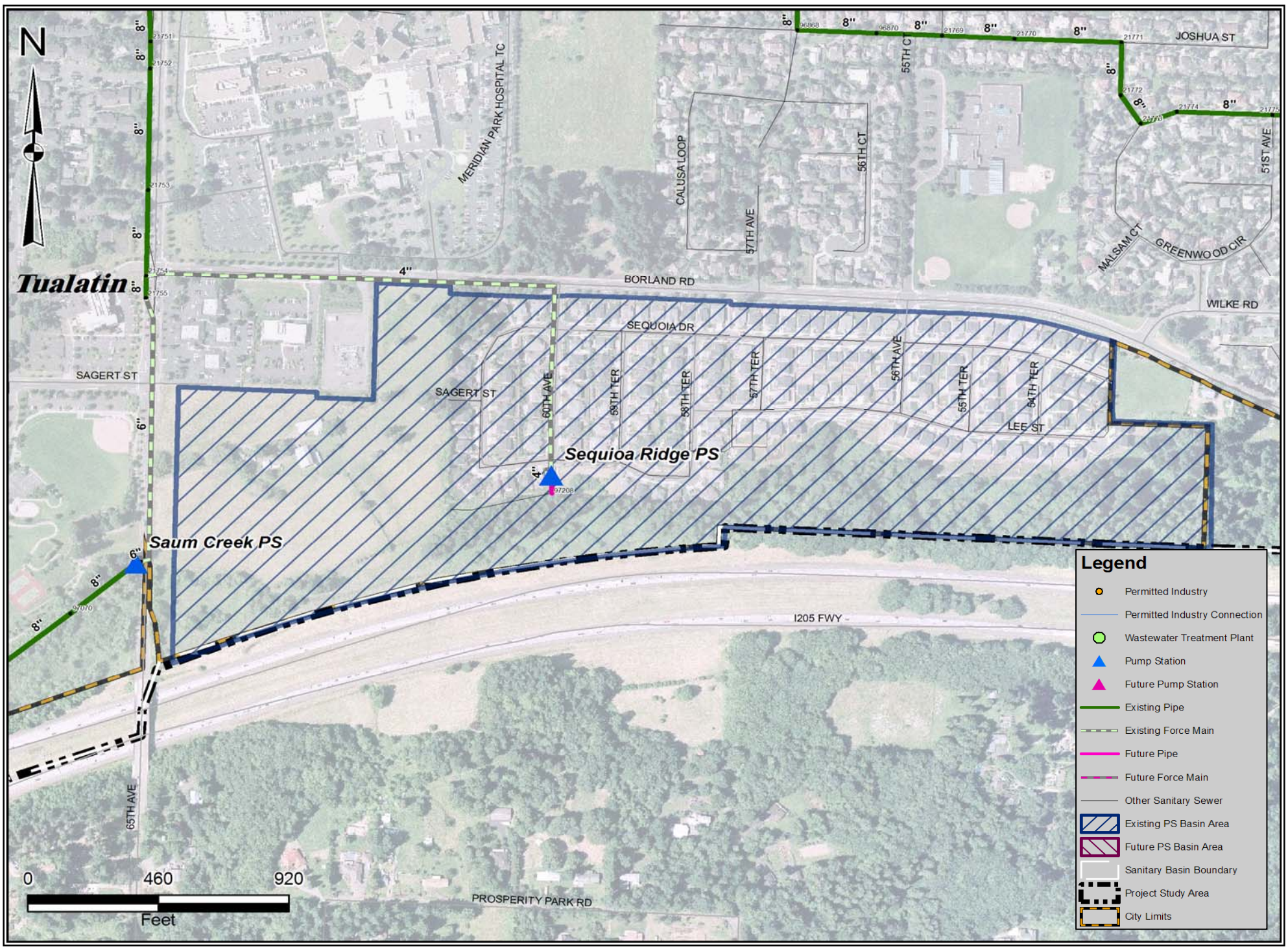

Sequioa Ridge PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	31	7.65	0.04	1,590	0.20	3.53	-0.01	236	236	567	-20	Y
2015 Conditions[9]	31	7.65	0.04	1,590	0.20	3.53	-0.01	236	236	567	-20	Y
Buildout Conditions[9]	62	6.37	0.06	1,590	0.25	4.51	-0.07	396	396	950	-126	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.25	4.51	-0.07	396	N/A	N/A	N/A	N/A
Firm Capacity					0.19							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Sequioa Ridge

Pump station and force main are marginally adequate through 2015. Upgraded pumps and controls may be needed for buildout conditions and are currently included in the planned improvements.

Sequioa Ridge PS

Firm Capacity: 0.19 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 4 in
FM Length: 2,163 ft

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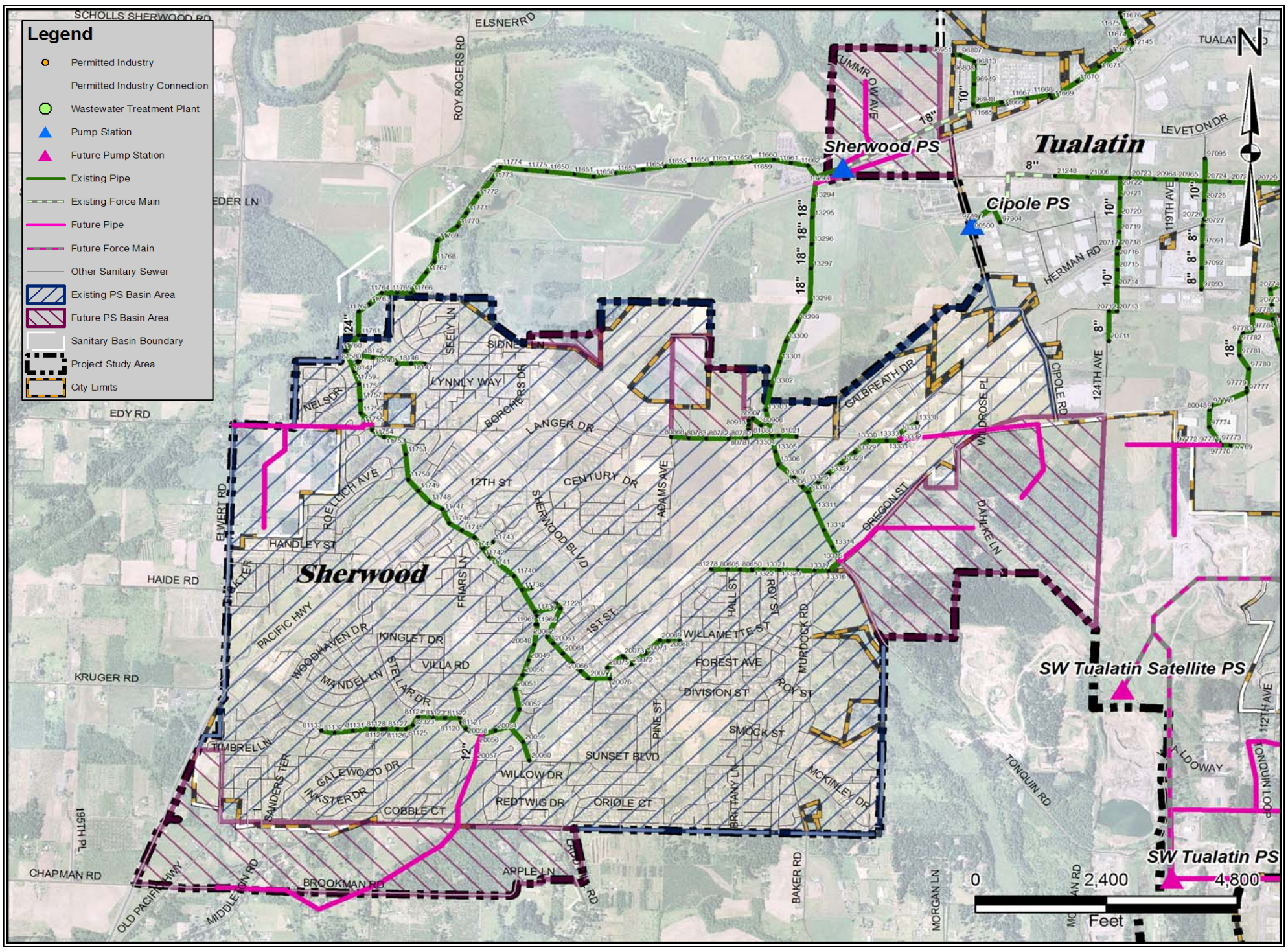

Sherwood PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	1,960	3.17	1.00	960	4.17	3.66	1.23	6,218	2,471	5,930	2,348	N
2015 Conditions[9]	2,147	6.48	2.24	1,120	6.75	5.92	-1.35	13,924	6,607	15,857	-2,591	Y
Buildout Conditions[9]	2,882	8.90	4.13	1,770	11.93	10.45	-6.53	25,646	15,598	37,435	-12,507	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	81.65	71.52	-76.25	25,646	N/A	N/A	N/A	N/A
Firm Capacity					5.40							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Sherwood

Pump station and force main are adequate under existing conditions but will require increased capacity by 2015. Upgrades to the pump station are currently in design.

For master planning purposes, it is assumed that a replacement pump station will be constructed by 2015, with expandability to buildout flow capacity.

A parallel 18-inch force main will be needed to accommodate buildout flows, and is assumed to be constructed with the pump station upgrade.

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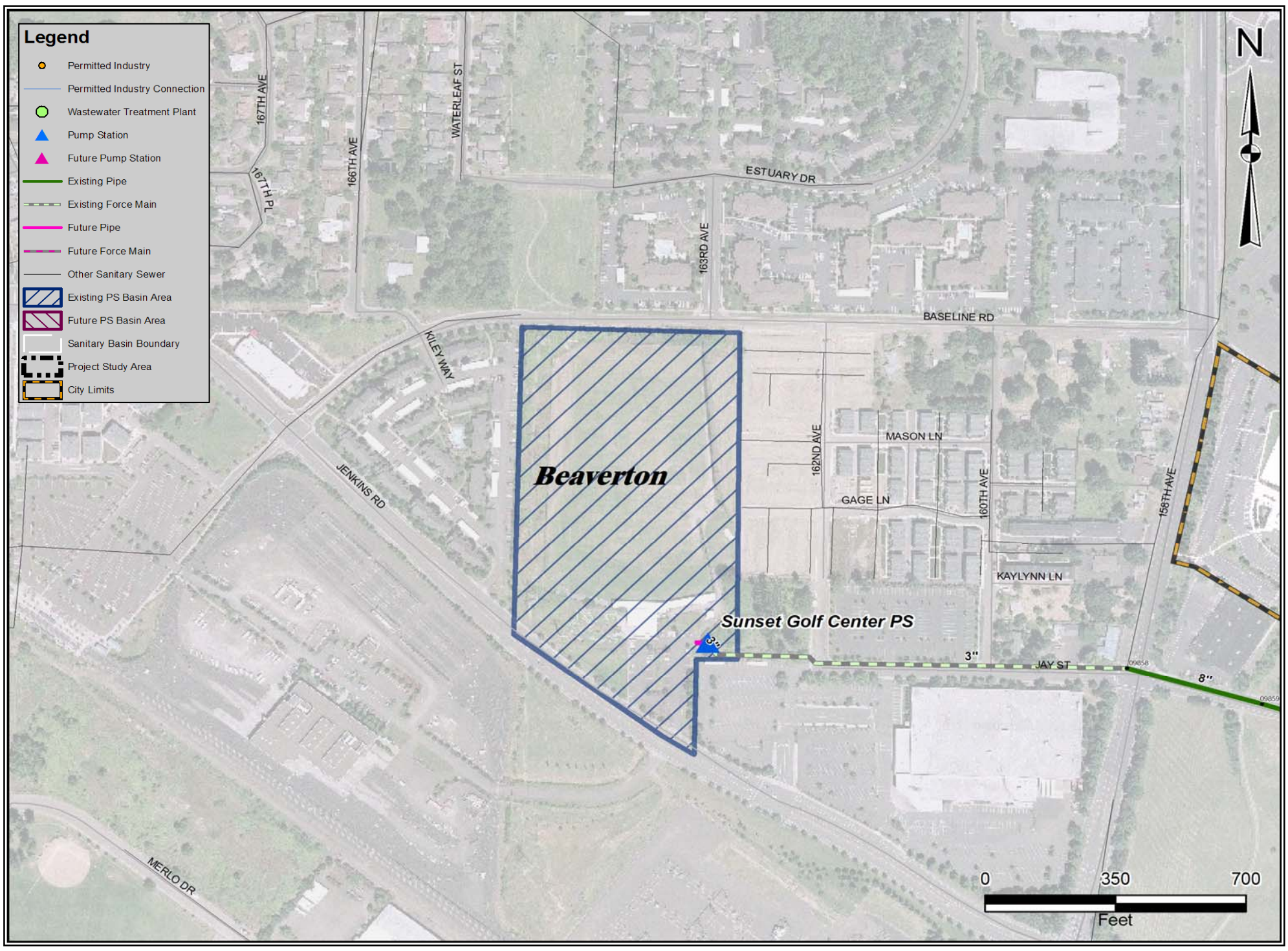
Sherwood PS

Firm Capacity: 5.40 mgd
No. Pumps: 2
Basin: Durham

FM Diameter: 18 in
FM Length: 2,804 ft



Sunset Golf Center PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	12	14.19	0.03	1,900	0.07	2.12	-0.07	168	148	354	-129	N
2015 Conditions[9]	12	14.19	0.03	1,900	0.07	2.12	-0.07	168	148	354	-129	N
Buildout Conditions[9]	13	15.29	0.03	1,900	0.07	2.36	-0.07	198	177	426	-144	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.07	2.36	-0.07	198	N/A	N/A	N/A	N/A
Firm Capacity					(not available)							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Sunset Golf Center PS

Pump station and force main serve a very small area with no known growth plans. No improvement is anticipated for this facility. Pump station capacity rating is not available.

Sunset Golf Center PS

Firm Capacity: (not available)
No. Pumps: (not available)
Basin: Rock Creek

FM Diameter: 3 in
FM Length: 1,151 ft

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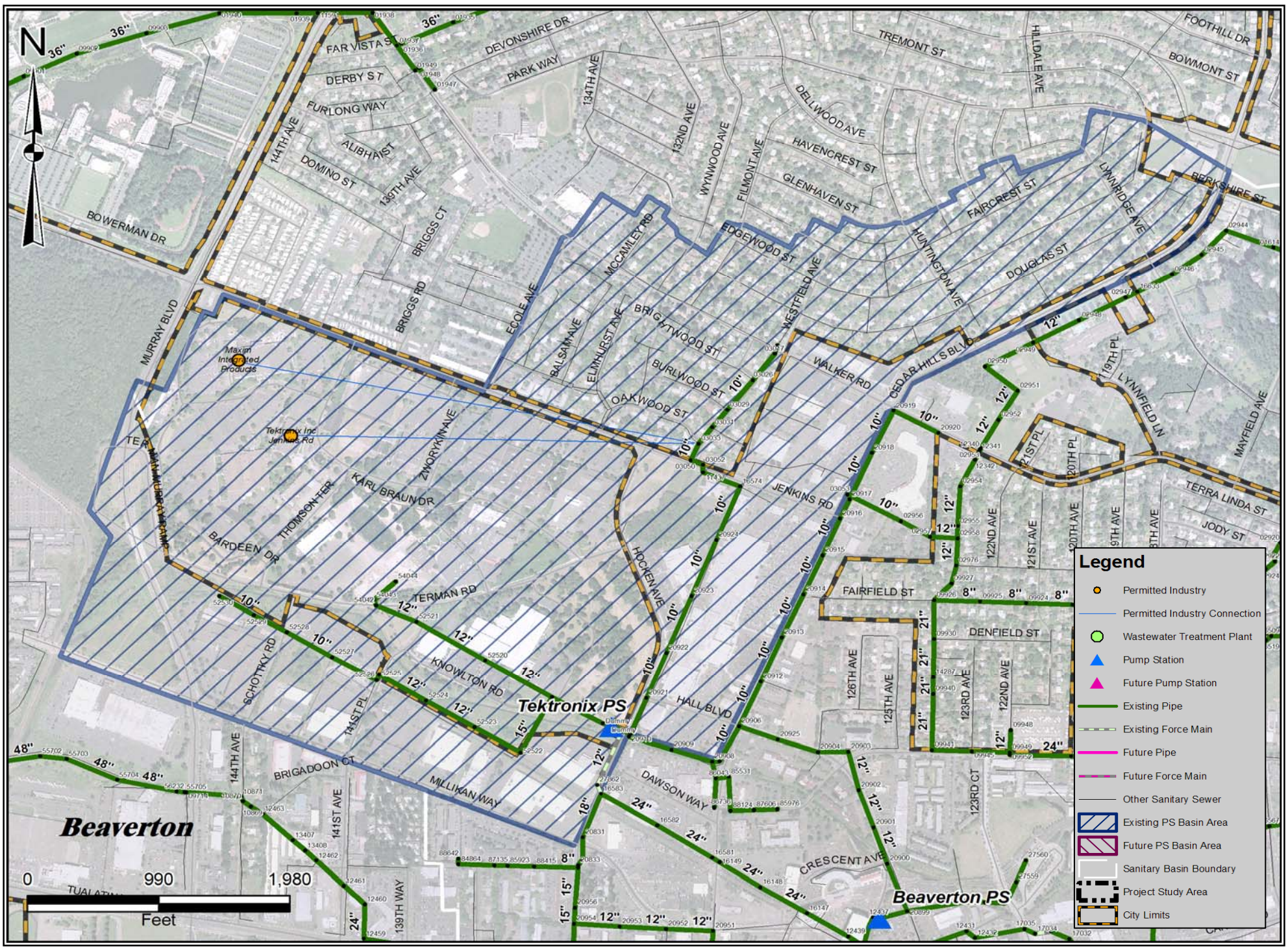

Tektronix PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	426	5.18	0.35	5,590	4.06	8.00	2.42	2,205	593	1,424	4,633	N
2015 Conditions[9]	440	5.67	0.40	5,620	4.22	8.32	2.26	2,495	593	1,424	4,325	N
Buildout Conditions[9]	466	6.54	0.49	5,660	4.97	9.80	1.51	3,048	678	1,627	2,892	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	5.82	11.47	0.66	3,048	N/A	N/A	N/A	N/A
Firm Capacity					6.48							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Tektronix

Pump station and force main are adequately sized for buildout, based on assumed firm capacity.

District information does not include rated firm capacity of the pump station, but lists the capacity of each pump at 2,250 gpm (3.24 mgd) at 46 ft total design head. For planning purposes, it is assumed this pump rating is based on head conditions with two pumps running plus one standby pump, and therefore represents one half of the firm pump station capacity. The firm pump station capacity should be verified by the District.

Firm Capacity: 6.48 mgd
No. Pumps: 3
Basin: Durham
FM Diameter: 12 in
FM Length: 705 ft

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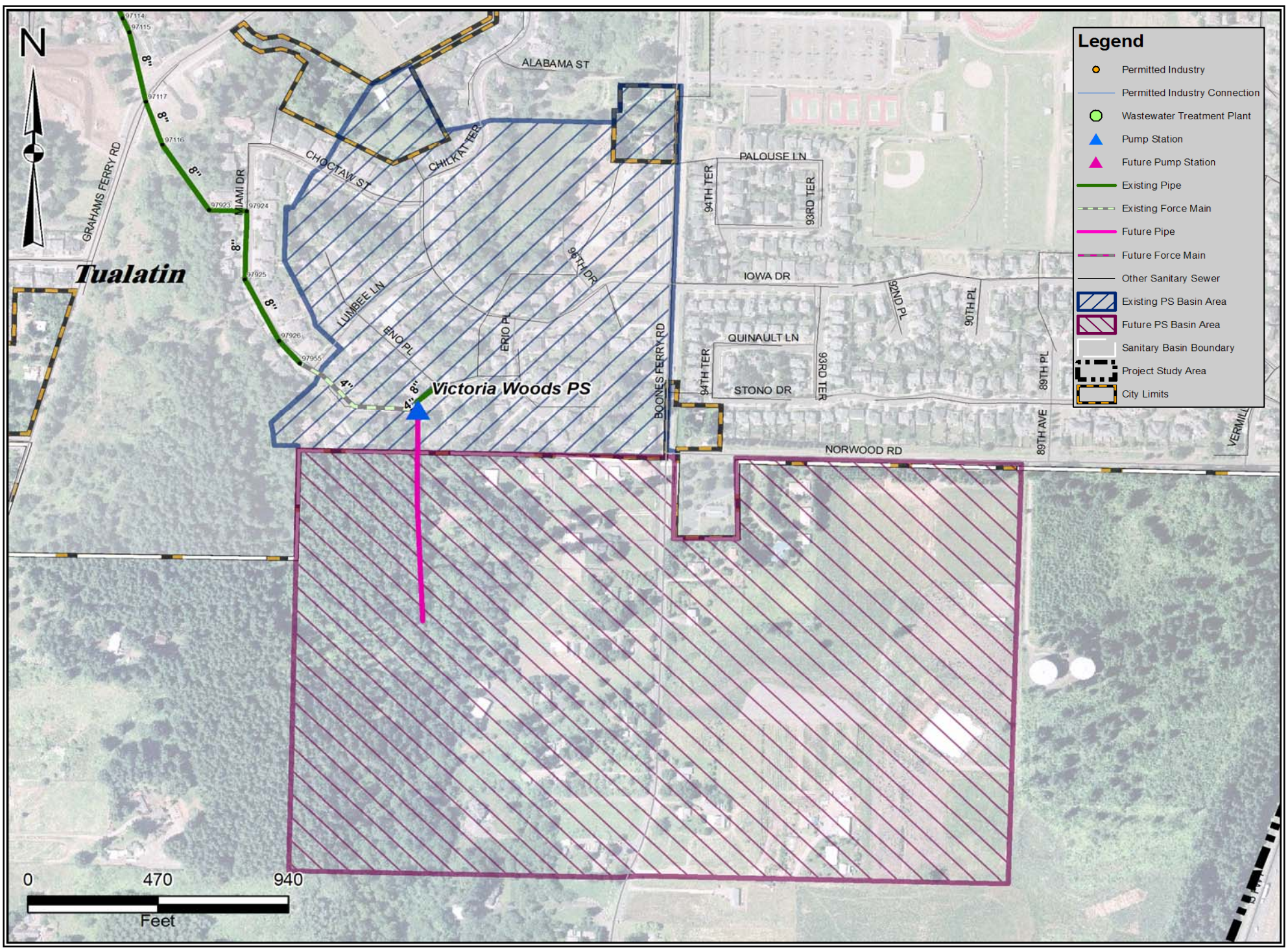

Victoria Woods PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	14	0.73	0.002	260	0.03	0.60	0.25	10	10	25	487	N
2015 Conditions[9]	14	13.81	0.03	1,200	0.10	1.80	0.19	199	94	225	357	N
Buildout Conditions[9]	144	13.81	0.32	2,760	0.98	17.44	-0.70	1,992	938	2,250	-1,332	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.98	17.44	-0.70	1,992	N/A	N/A	N/A	N/A
Firm Capacity					0.29							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Victoria Woods

Pump station and force main are adequately sized for modeled 2015 conditions. A relacement pump station and force main will be needed to accommodate the growth area south of the existing pump station. The timing of growth south of Norwood Road will determine the timing of the pump station improvements. The replacement pump station will need to be 30 to 35 ft deep in order to serve the identified growth area, about 25 ft deeper than the existing 10 ft deep wet well.

A parallel 6-inch force main is recommended for partial redundancy, subject to further consideration during design.

Victoria Woods PS

Firm Capacity: 0.29 mgd
No. Pumps: 2
Basin: Durham
FM Diameter: 4 in
FM Length: 495 ft

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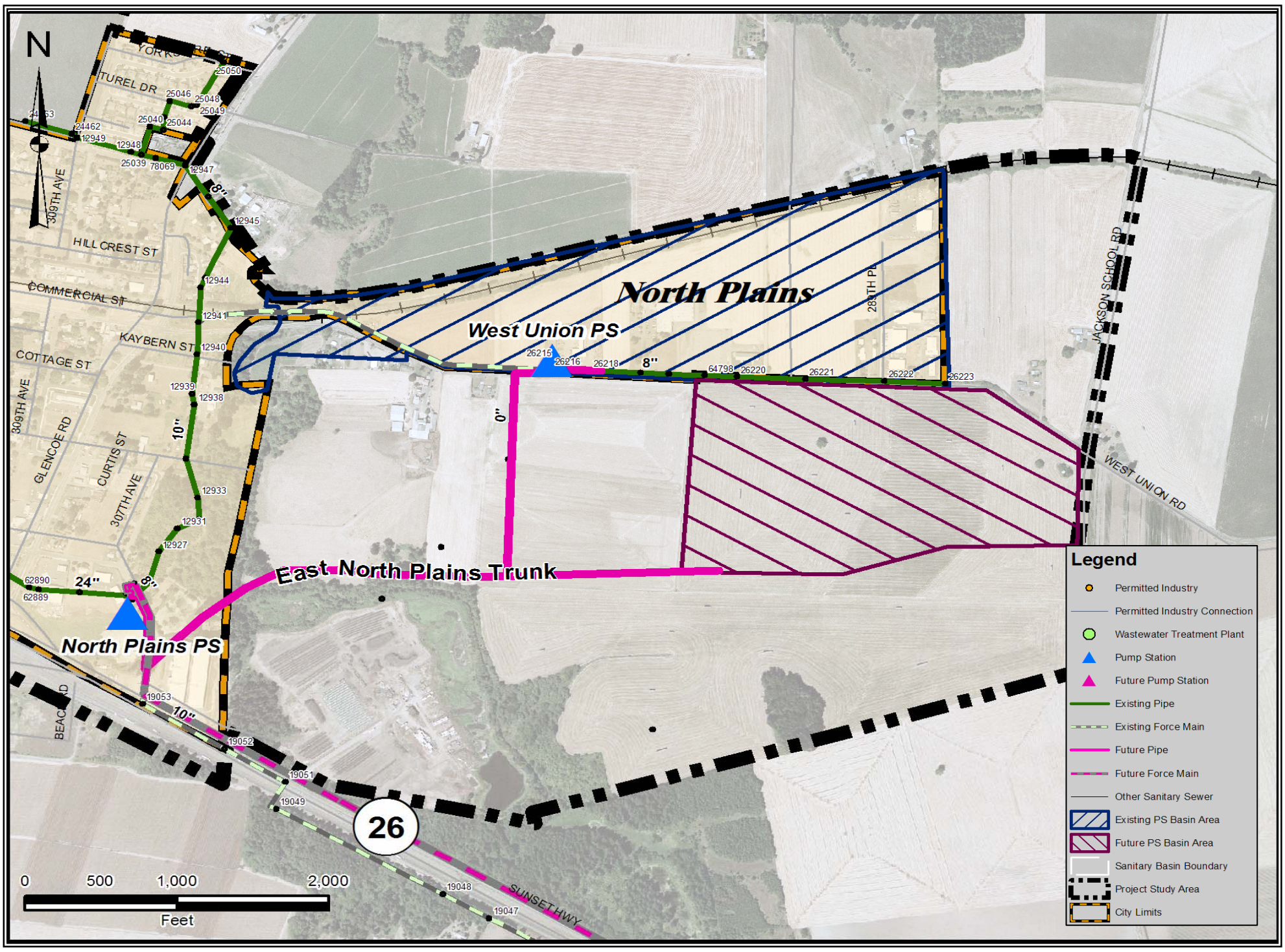

West Union PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	138	5.79	0.13	1,350	0.40	1.78	0.43	802	4	9	831	N
2015 Conditions[9]	138	14.76	0.33	1,870	0.88	3.92	-0.05	2,044	878	2,106	-92	Y
Buildout Conditions[9]	167	16.30	0.44	1,830	1.39	6.16	-0.55	2,729	1,390	3,337	-1,061	Y
Buildout Plus Conditions	N/A	N/A	N/A	N/A	1.39	6.16	-0.55	2,729	N/A	N/A	N/A	N/A
Firm Capacity					0.84							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: West Union

Pump station and force main are adequately sized for anticipated flows, which are limited by downstream gravity sewer capacity. In the near future, flows will be diverted to a new trunk sewer and conveyed without pumping to the North Plains PS. The gravity sewer is currently in preliminary design.

West Union PS

Firm Capacity: 0.84 mgd
No. Pumps: 2
Basin: Hillsboro
FM Diameter: 8 in
FM Length: 2,564 ft

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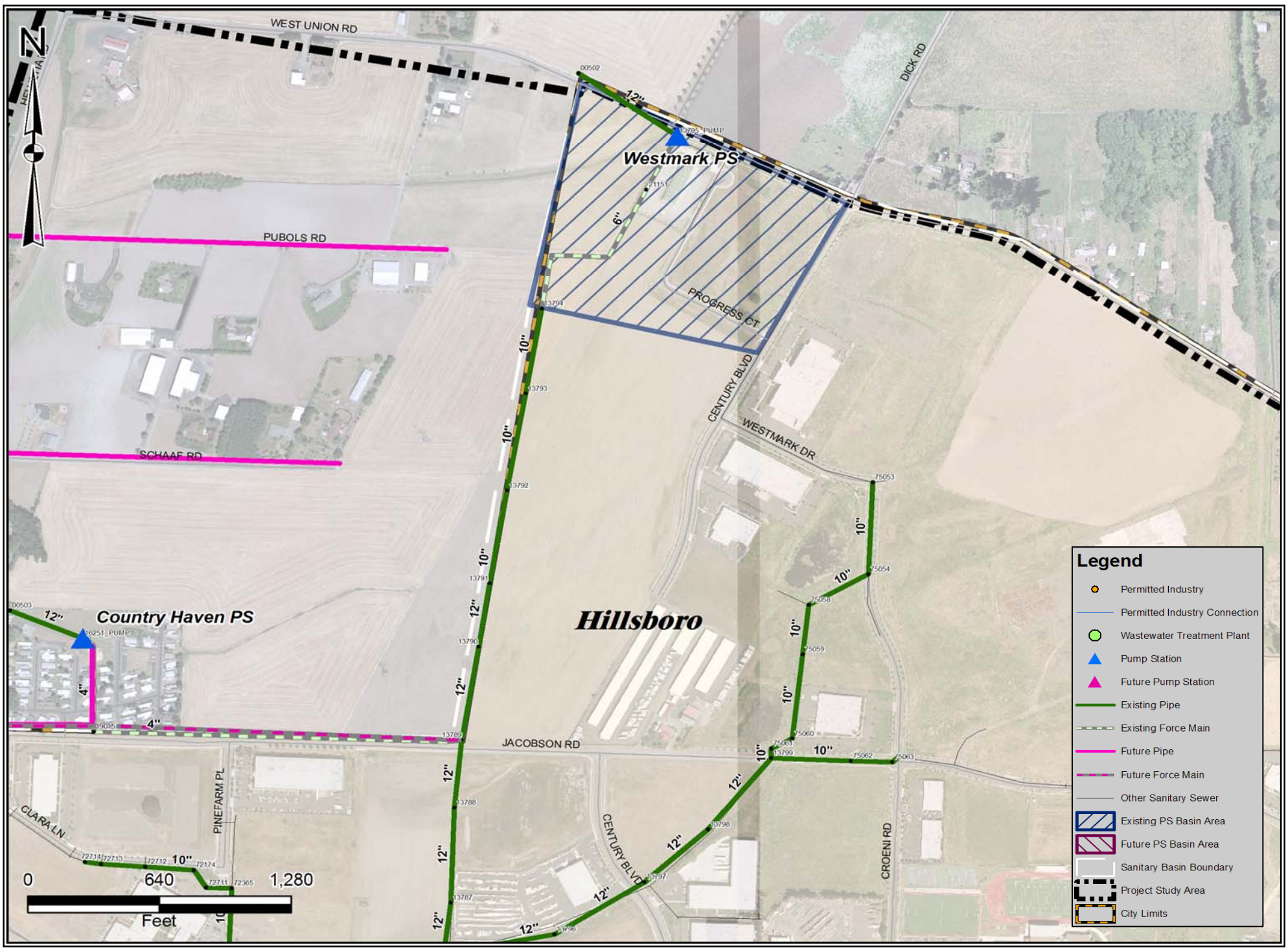

Westmark PS

Scenario	Developed PS Basin Size, acres	PS Basin Composite Density, EDU[1]/acre	Total ADWF[2], mgd	PS Basin Composite I/I[3], gpd/acre	Modeled PWWF[4], mgd	Modeled Force Main Velocity[5], fps	Remaining Firm Capacity, mgd	PS Basin EDUs[6]	Approx. Residential DUs[7]	Approx. Residential Population @ 2.4 pers/DU	Remaining EDUs[8]	Improvement Required?, Y/N
Existing Conditions	3	9.32	0.00	2,230	0.07	0.59	0.44	27	0	0	839	N
2015 Conditions[9]	7	20.03	0.02	2,230	0.12	0.94	0.39	144	0	0	754	N
Buildout Conditions[9]	18	20.52	0.06	2,230	0.21	1.63	0.31	359	0	0	585	N
Buildout Plus Conditions	N/A	N/A	N/A	N/A	0.21	1.63	0.31	359	N/A	N/A	N/A	N/A
Firm Capacity					0.51							

Footnotes:
1. Equivalent Dwelling Units
2. Average Dry Weather Flow
3. Inflow and Infiltration
4. Peak Wet Weather Flow
5. Based on existing force main diameter and modeled PWWF. Actual velocity will be determined by pumping rate.
6. Based on total ADWF and 161 gpd/EDU
7. Based on residential ADWF and 161 gpd/DU. Assumes flows from growth areas with a non-specific land use (RRFU or FF) is 72% residential.
8. Assumes 8 EDU/acre for the purpose of converting remaining PWWF capacity to an equivalent ADWF
9. Includes RRFU and FF land use areas listed as occupied

Master Planning Notes: Westmark

Pump station and force main are adequately sized for buildout.

Westmark PS

Firm Capacity: 0.51 mgd
No. Pumps: 2
Basin: Rock Creek
FM Diameter: 6 in
FM Length: 1,292 ft

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