Attachment P – Sewer Capacity Analysis

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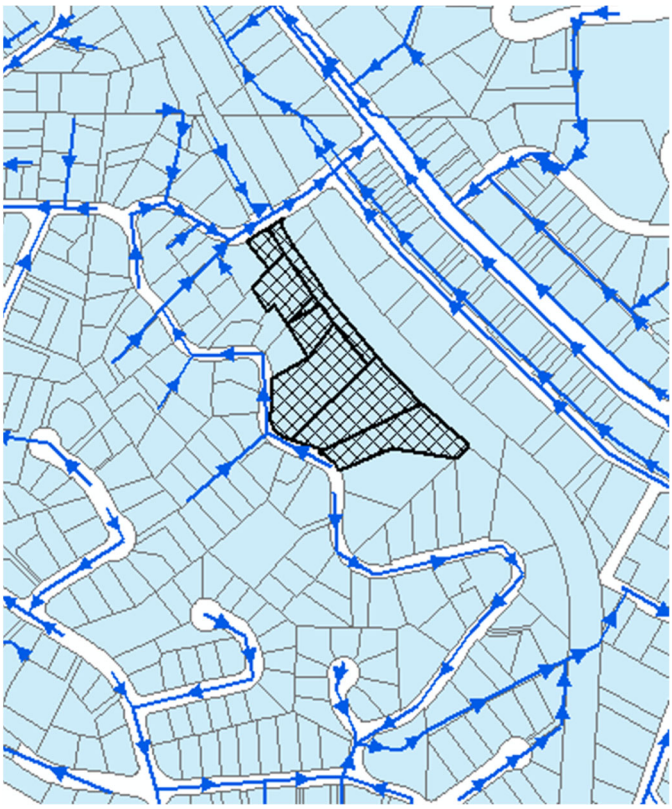


Sewer Capacity Analysis for the Kensho Housing Development

City of Vista On Call Hydraulic Modeling

Vista, California
February 23, 2023

Introduction

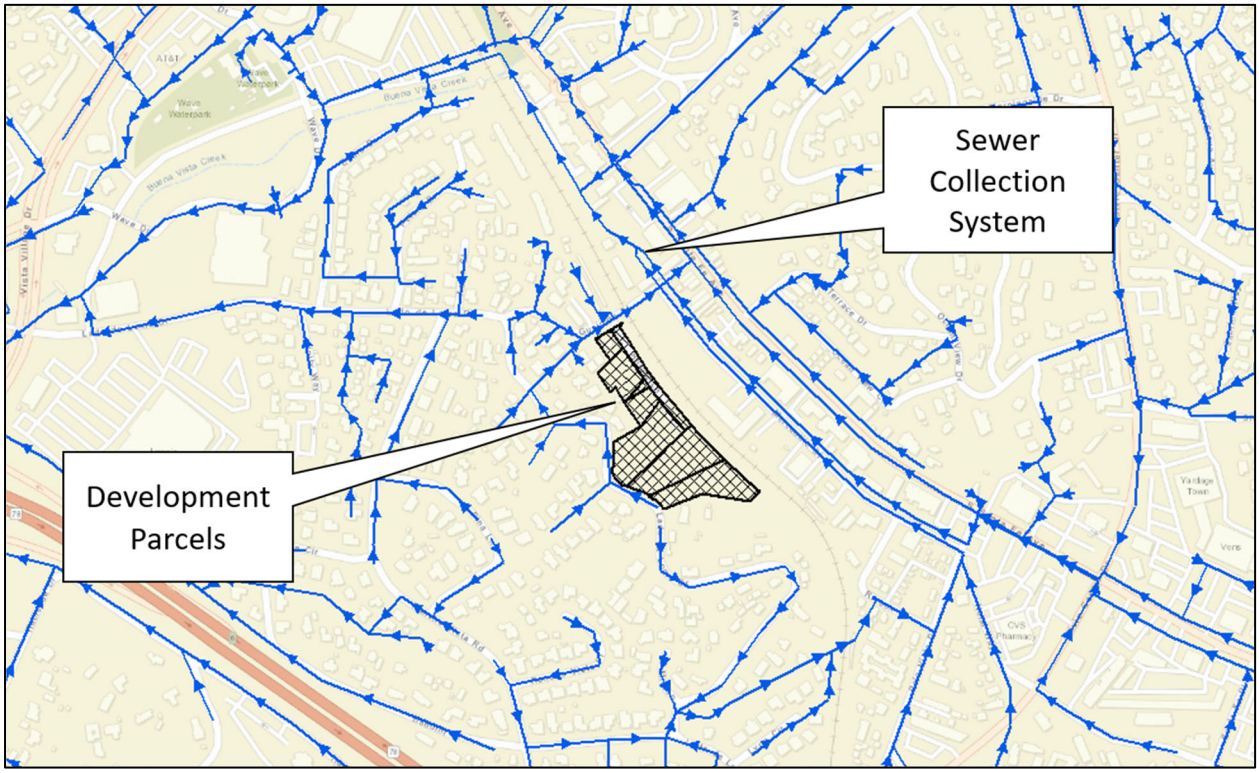
The City of Vista (City) is considering the proposed Kensho Housing Development (Development) in the vicinity of Guajome Street and Lado de Loma Drive. The Development area was originally zoned for 24 detached single-family residential homes per the 2030 General Plan (General Plan). The proposed development would instead result in the construction of 183 residential apartments, with a mix of studio, one-bedroom, and two-bedroom units. The City has commissioned HDR Engineering (HDR), Inc. to complete hydraulic analyses, using the City's InfoSWMM® hydraulic model, to estimate the effects the development flow loading will have on the downstream sewer collection system. This technical memorandum (TM) describes the hydraulic model update, analysis, and results.

Background

In early 2016, the City commissioned HDR to complete the Comprehensive Sewer Management Plan (CSMP) for the City of Vista and Buena Sanitation District which included a Master Plan Update. As part of the 2016 Mater Plan Update (Master Plan), HDR updated the City's InfoSWMM® hydraulic model to include updated flow and infrastructure information.

This task involves updating the hydraulic model with Capital Improvement Projects (CIP) 8289 and CIP 8291 and verify the impacts of the proposed development near Guajome Street and Lado de Loma Drive, as shown in Figure 1 below. Hydraulic analysis will consist of updating the model network, incorporating the additional loading into the model, running the model for existing and buildout conditions, and evaluating model results based on the design and evaluation criteria from the Master Plan.

Figure 1 - Proposed Development near Guajome Drive and Lado de Loma Drive



Hydraulic Model Update

Hydraulic model update and analysis consisted of the following:

- Updating City's InfoSWMM® hydraulic model with CIP 8289 and CIP 8291
- Calculating revised flow loading based on the amendment to the General Plan

The current hydraulic model was calibrated as part of the Master Plan and is assumed to be calibrated for the existing system and adequate for the buildout system analysis.

CIP 8289 and CIP8291 Model Updates

Prior to the sewer capacity analysis, the model was updated to include system improvements related to two capital improvement projects (CIP), including CIP 8289 and CIP 8291. These CIP projects include improvements to the sewer collection system downstream of the Development location. The projects collectively include adding, abandoning, and upsizing gravity mains along Guajome Street, South Santa Fe Avenue, Pala Vista Drive, Oceanview Drive, Terrace Drive, and Civic Center Drive. **Error! Reference source not found.** shows the sewer mains included in these projects. Table 1 summarizes the details of CIP 8289 and CIP 8291.

Figure 2. CIP 8289 and CIP 8291 Updates

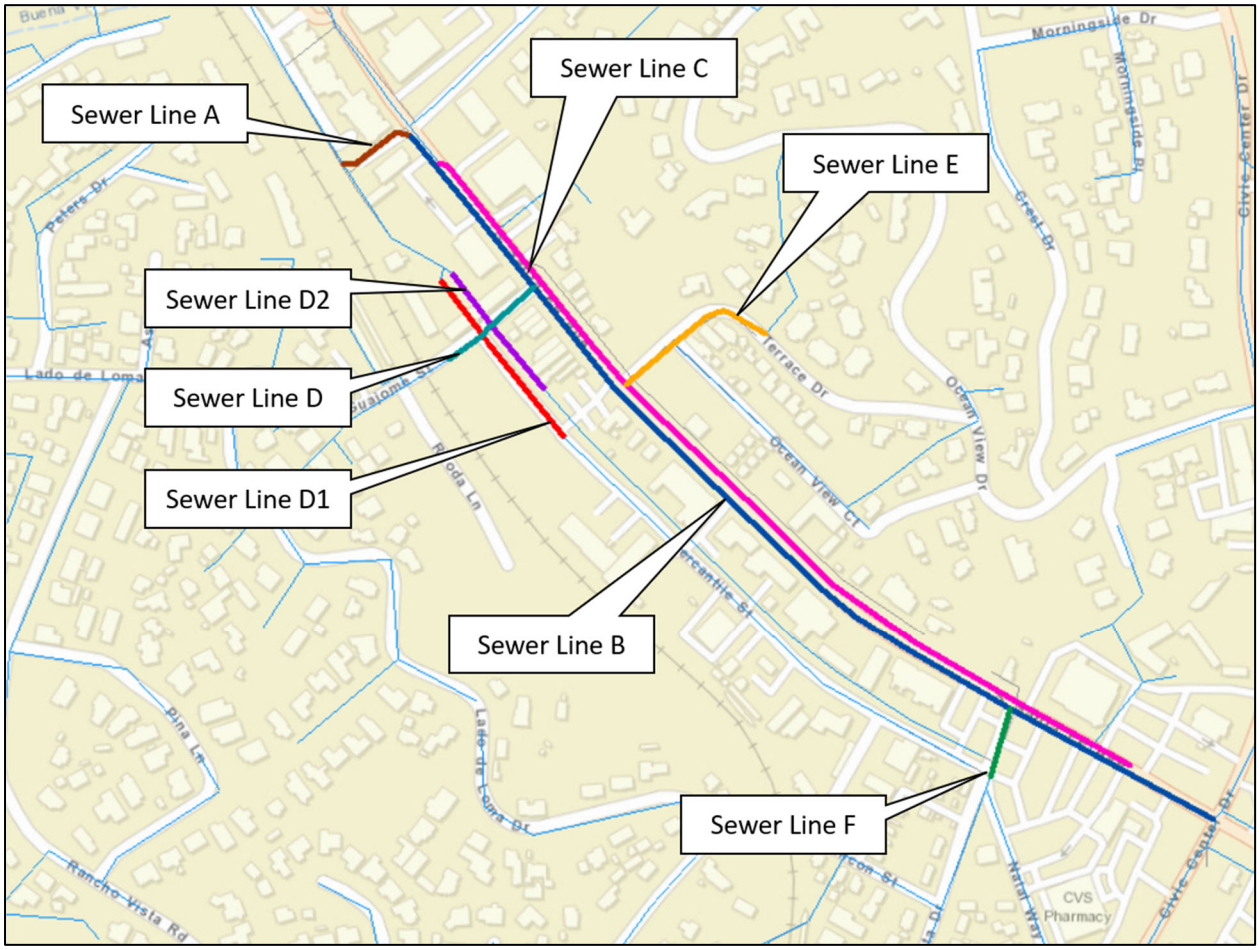


Table 1 - CIP 8289 and CIP 8291 Summary

CIP Number	Sewer Lines in CIP	Street Reference	Model Update Note
8289	Sewer Line F	Pala Vista Drive to South Santa Fe Avenue	Mains upsized from 6-inch to 12-inch
8289	Sewer Line E	Terrace Drive to South Santa Fe Avenue	Mains upsized from 6-inch to 8-inch
8289	Sewer Line D	Guajome Street to South Santa Fe Avenue	Updated inverts
8289	Sewer Line D 1	Mercantile Street and Guajome Street intersection	Updated inverts
8289	Sewer Line D 2	Mercantile Street and Guajome Street intersection	Updated inverts
8289	Sewer Line C	South Santa Fe Avenue	New 8-inch main along the East side of street
8291	Sewer Line B	South Santa Fe Avenue	Mains upsized from 15-inch to 18-inch
8289	Sewer Line A	Ocean View Drive	Updated inverts

Updated Flow Loading

Flow loading in the District's Master Plan hydraulic model was updated to reflect the land use changes associated with the planned Development. Model flow loading was updated for both the exiting system and buildout model scenarios.

Existing System Flow Loading Updates

The existing system scenario in the Master Plan model originally included no flow loading from the Development parcels, since the parcels were listed as either vacant or as transportation corridors when the model was updated as part of the Master Plan.

For existing system flow loading updates, Development flows were calculated based on the number of multi-family residential units planned for the Development (183) and the corresponding flow loading criteria from the Master Plan. Master Plan flow loading criteria for multi-family residential equivalent dwelling units (EDUs) is 205 gpd/EDU times 0.70, or 143.5 gpd/EDU (page 3-7 or the Master Plan, third paragraph). Flow loading from the transportation corridor parcel was assumed to be zero. The resulting estimated flow for the Development (183 EDUs * 143.5 gpd/EDU = 26,261 gpd) was added to the existing system model scenario. Per Development plans, the Development flows were loaded at manhole V28164, as shown in Figure 3.

Development flows added to the model were assigned residential diurnal patterns as defined in the Master Plan. The weekday and weekend day diurnal patterns included for the Development flows in the model are shown in Figure 4.

Additional rainfall derived inflow and infiltration (RDII) from the Development was considered negligible, and no additional RDII was added to the modeled system at the Development connection.

Figure 3. Flow loading Manhole for Kensho Development

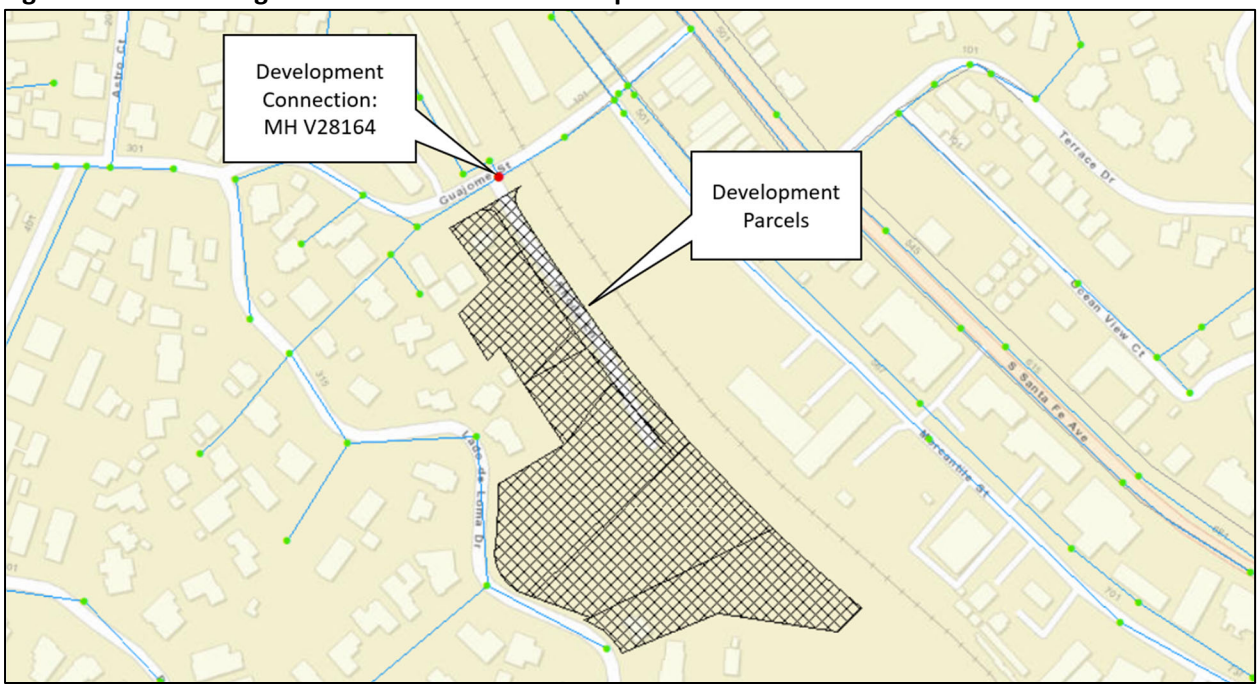
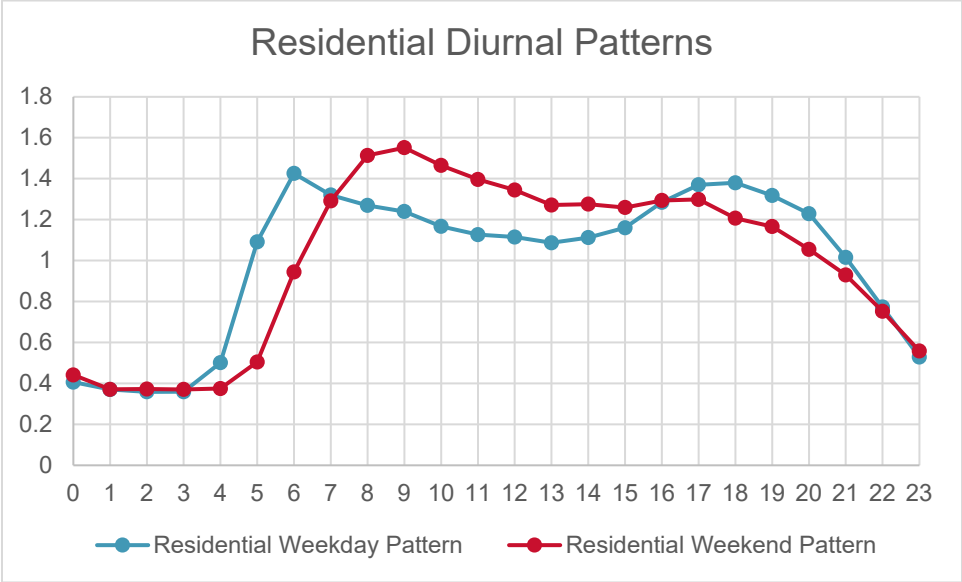


Figure 4. Residential Diurnal Patterns Used in Updating the Flow Loading



Source: 2016 Master Plan Update

Buildout System Flow Loading Updates

Seven of the eight Development affected parcels were originally planned for single family residential development per the General Plan land use designations. The eighth parcel was originally planned to remain transportation corridor.

The original Master Plan model includes projected buildout flow loading from the originally planned single family residential parcels based on land use generation rate of 310 gpd/acre (Vista 2016 Master Plan Update, Table 3-10). The acres per parcel and the flow loading included in the original Master Plan model for the Development affected parcels are shown in Table 2.

Table 2. Original Buildout ADWF Calculations

APN	Original Planned Land Use [1]	Area (acres)	Generation Rates (gpd/acre) [2]	Original Buildout ADWF (gpd)
1790933000	Single Family Residential	0.05	310	14
1790933200	Single Family Residential	0.27	310	84
1790931800	Single Family Residential	1.11	310	345
1790932300	Single Family Residential	0.48	310	149
1790240900	Single Family Residential	0.17	310	52
1790930500	Single Family Residential	0.93	310	290
1790933400	Single Family Residential	1.14	310	353
	Total:	4.15	Total:	1,287

[1] Source: 2030 General Plan

[2] Source: Vista 2016 Master Plan Update, Table 3-10

Buildout flow loading in the model was updated by removing the original planned, land use based loading included in the model (1,287 gpd as shown in Table 2) and adding the projected Development flows discussed in the Existing System Flow Loading Updates Section (26,261 gpd). Therefore, the total net change in flow loading for the buildout system model scenario due to the Development is approximately 24,974 gpd for average dry weather flow conditions.

Development flows added to the model for the buildout system scenario were assigned residential diurnal patterns as defined in the Master Plan, as shown in Figure 4.

As with the existing system scenario, additional rainfall derived inflow and infiltration (RDII) from the Development was considered negligible, and no additional RDII was added to the buildout model system at the Development connection.

Model Analysis and Results

The model was updated with the revised flow loading discussed in the Updated Flow Loading Section and run for existing and buildout, dry and wet weather flow conditions. Wet weather flow conditions were simulated using the design storm and RDII loading included in the Master Plan model. Model scenarios run as part of this analysis include:

- Existing System with CIP Upgrades: Dry Weather Flow Conditions
- Existing System with CIP Upgrades: Wet Weather Flow Conditions
- Existing System, CIP Upgrades + Development Flows: Dry Weather Flow Conditions
- Existing System, CIP Upgrades + Development Flows: Wet Weather Flow Conditions
- Buildout System with CIP Upgrades: Dry Weather Flow Conditions
- Buildout System with CIP Upgrades: Wet Weather Flow Conditions
- Buildout System, CIP Upgrades + Development Flows: Dry Weather Flow Conditions
- Buildout System, CIP Upgrades + Development Flows: Wet Weather Flow Conditions

Model results were analyzed for the collection system along the flow path from the Development location to the terminus of the hydraulic model at the Vista/ Carlsbad Interceptor. The model results were compared with evaluation criteria from the Master Plan for peak wet weather flow (PWWF) conditions including:

- PWWF Depth to Diameter Ratio (d/D) < 0.80, and
- PWWF to Calculated Full Pipe Flow (q/Q) <= 1.00

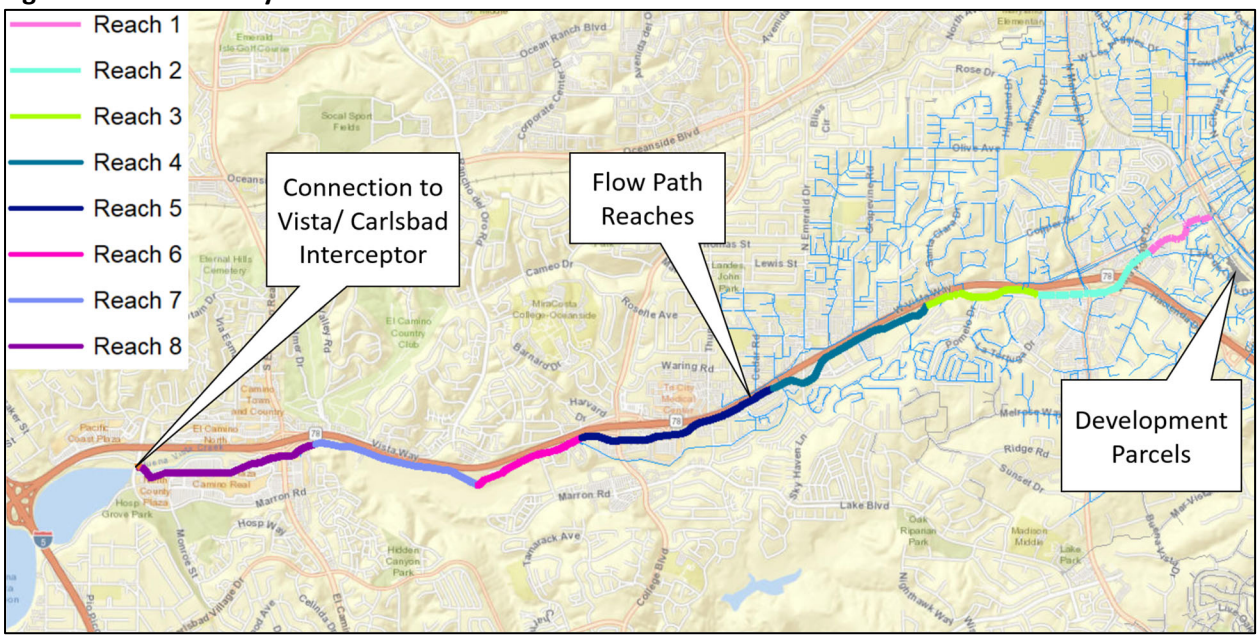
Per the Master Plan, both PWWF evaluation criteria need to be exceeded for a system upgrade to be recommended.

Model results formatted for this study include results for peak dry weather flow (PDWF) and PWWF conditions. Results were formatted in results tables and as hydraulic grade line (HGL) profiles. Results for the CIP 8289 and CIP 8291 project areas were organized by sewer line, as shown in Figure 2. Results for the collection system downstream of the CIP areas were organized by the flow path reaches shown in Figure 5.

Due to the file size, model results are included in the appendices, including:

- Appendix A: Existing and Buildout PDWF Model Results Tables
- Appendix B: Existing and Buildout PWWF Model Results Tables
- Appendix C: Existing System with CIP Upgrades: PWWF HGL Profiles
- Appendix D: Existing System, CIP Upgrades+ Development Flows: PWWF HGL Profiles
- Appendix E: Buildout System with CIP Upgrades: PWWF HGL Profiles
- Appendix F: Buildout System, CIP Upgrades+ Development Flows: PWWF HGL Profiles

Figure 5 - Model Analysis Flow Path Reaches



Conclusion & Recommendations

The model results indicate that the addition of Development flows to the collection system is not projected to result in additional deficiencies in the downstream collection system under either existing or buildout PWWF conditions. The collection system network does not indicate surcharging mains and all gravity mains in the primary collection system downstream of the Development location meet the Master Plan evaluation criteria.

The model does show some interceptor mains that get close to full and exceed the Master Plan criteria both before and after the Development flows are included (Reach 8 in the results). These interceptor mains are located near the Westfield Plaza Mall/ Shoppes at Carlsbad where the 42-inch interceptor decreases to 36-inch diameter. However, the addition of Development flows is not projected to significantly affect existing or buildout PWWF conditions at this location.

Appendix A
Existing & Buildout Peak Dry Weather Flow Model Results Tables

Appendix A: Existing and Buildout PDWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
Sewer Line F	5961	V28137-V28138	V28137.00-V28138.00	12	12	0.234	0.07	0.19	0.234	0.07	0.19	0.462	0.14	0.26	0.462	0.14	0.26
	EC-P-237	-	-	12	12	0.234	0.08	0.19	0.234	0.08	0.19	0.463	0.16	0.29	0.463	0.16	0.29
	EC-P-186	-	-	18	18	0.757	0.09	0.20	0.757	0.09	0.20	2.008	0.24	0.34	2.008	0.24	0.34
Sewer Line E	EC-P-232	-	-	8	8	0.0164	0.01	0.07	0.0164	0.01	0.07	0.0134	0.01	0.06	0.0134	0.01	0.06
	EC-P-234	-	-	8	8	0.0164	0.01	0.05	0.0164	0.01	0.05	0.0134	0.00	0.05	0.0134	0.00	0.05
	EC-P-230	-	-	8	8	0.0180	0.01	0.05	0.0180	0.01	0.05	0.0146	0.00	0.05	0.0146	0.00	0.05
	EC-P-229	-	-	8	8	0.0180	0.01	0.06	0.0180	0.01	0.06	0.0146	0.01	0.06	0.0146	0.01	0.06
	EC-P-231	-	-	8	8	0.0280	0.01	0.07	0.0280	0.01	0.07	0.0323	0.01	0.07	0.0323	0.01	0.07
	EC-P-209	-	-	8	8	0.0296	0.03	0.13	0.0296	0.03	0.13	0.0526	0.06	0.17	0.0526	0.06	0.17
	EC-P-210	-	-	8	8	0.0296	0.03	0.13	0.0296	0.03	0.13	0.0526	0.06	0.17	0.0526	0.06	0.17
Sewer Line D3	2455	V24054.P0-V24054.Q0	V24054.P0-V24054.Q0	8	8	0.0026	0.00	0.05	0.0026	0.00	0.05	0.0246	0.03	0.13	0.0246	0.03	0.13
	5799	V24054.Q0-V24054	V24054.Q0-V24054.00	8	8	0.0038	0.00	0.05	0.0038	0.00	0.05	0.0310	0.04	0.13	0.0310	0.04	0.13
	EC-P-240	-	-	8	8	0.0042	0.00	0.05	0.0042	0.00	0.05	0.0388	0.04	0.13	0.0388	0.04	0.13
	EC-P-218	-	-	8	8	0.0042	0.00	0.03	0.0042	0.00	0.03	0.0388	0.01	0.08	0.0388	0.01	0.08
	EC-P-223	-	-	8	8	0.0043	0.03	0.09	0.0118	0.07	0.14	0.0028	0.01	0.17	0.0066	0.02	0.19
	5798	V24055-V24056	V24055.00-V24056.00	8	8	0.0044	0.00	0.12	0.0119	0.01	0.19	0.0029	0.00	0.18	0.0067	0.01	0.21
	2459	V24056-V24057	V24056.00-V24057.00	12	12	0.0100	0.02	0.08	0.0273	0.05	0.12	0.0340	0.07	0.14	0.0453	0.09	0.16
Sewer Line D2	5700	V28141-V28142	V28141.00-V28142.00	8	8	0.0011	0.00	0.03	0.0011	0.00	0.03	0.0342	0.05	0.16	0.0342	0.05	0.16
	EC-P-239	-	-	8	8	0.0010	0.00	0.02	0.0010	0.00	0.02	0.0402	0.04	0.11	0.0402	0.04	0.11
	EC-P-220	-	-	8	8	0.0010	0.00	0.01	0.0010	0.00	0.01	0.0402	0.01	0.07	0.0402	0.01	0.07
	EC-P-222	-	-	8	8	0.0056	0.01	0.06	0.0155	0.02	0.10	0.0192	0.03	0.12	0.0267	0.04	0.14
	6959	V28167-V24056	V28167.00-V24056.00	8	8	0.0056	0.00	0.12	0.0155	0.01	0.19	0.0259	0.02	0.21	0.0334	0.02	0.24
	2459	V24056-V24057	V24056.00-V24057.00	12	12	0.0100	0.02	0.08	0.0273	0.05	0.12	0.0340	0.07	0.14	0.0453	0.09	0.16
Sewer Line D	5699	V28164-V28165	V28164.00-V28165.00	8	8	0.0308	0.01	0.08	0.0843	0.04	0.12	0.0578	0.02	0.11	0.0989	0.04	0.14
	EC-P-213	-	-	8	8	0.0308	0.01	0.07	0.0843	0.03	0.12	0.0656	0.02	0.10	0.1067	0.04	0.13
	EC-P-214	-	-	8	8	0.0263	0.01	0.07	0.0700	0.02	0.11	0.0865	0.03	0.12	0.120	0.04	0.14
	EC-P-215	-	-	8	8	0.0263	0.04	0.13	0.0700	0.10	0.22	0.0865	0.13	0.24	0.120	0.18	0.29
	EC-P-216	-	-	8	8	0.0262	0.04	0.19	0.0624	0.09	0.23	0.123	0.18	0.46	0.152	0.23	0.48
	EC-P-192	-	-	18	18	0.783	0.13	0.24	0.819	0.14	0.25	2.144	0.35	0.41	2.174	0.36	0.41
Sewer Line C	EC-P-203	-	-	8	8	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00
	EC-P-204	-	-	8	8	0.0001	0.00	0.02	0.0001	0.00	0.02	0.0040	0.00	0.06	0.0040	0.00	0.06
	EC-P-205	-	-	8	8	0.0016	0.00	0.03	0.0016	0.00	0.03	0.0125	0.01	0.08	0.0125	0.01	0.08
	EC-P-206	-	-	8	8	0.0016	0.00	0.03	0.0016	0.00	0.03	0.0164	0.02	0.10	0.0164	0.02	0.10
	EC-P-207	-	-	8	8	0.0016	0.00	0.03	0.0016	0.00	0.03	0.0164	0.02	0.10	0.0164	0.02	0.10
	EC-P-208	-	-	8	8	0.0016	0.00	0.03	0.0016	0.00	0.03	0.0164	0.02	0.09	0.0164	0.02	0.09

Appendix A: Existing and Buildout PDWF Model Results Tables

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						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	EC-P-209	-	-	8	8	0.0296	0.03	0.13	0.0296	0.03	0.13	0.0526	0.06	0.17	0.0526	0.06	0.17
	EC-P-210	-	-	8	8	0.0296	0.03	0.13	0.0296	0.03	0.13	0.0526	0.06	0.17	0.0526	0.06	0.17
	EC-P-211	-	-	8	8	0.0298	0.03	0.13	0.0298	0.03	0.13	0.0529	0.06	0.17	0.0529	0.06	0.17
	EC-P-212	-	-	8	8	0.0298	0.05	0.15	0.0298	0.05	0.15	0.0578	0.09	0.20	0.0578	0.09	0.20
	V24117-V24118	V24117-V24118	-	8	8	0.0298	0.04	0.14	0.0298	0.04	0.14	0.0587	0.08	0.20	0.0587	0.08	0.20
	V24118-V24119	V24118-V24119	-	8	8	0.0367	0.05	0.15	0.0367	0.05	0.15	0.0825	0.10	0.22	0.0825	0.10	0.22
	V24119-V24120	V24119-V24120	-	8	8	0.0367	0.05	0.15	0.0367	0.05	0.15	0.0827	0.11	0.22	0.0827	0.11	0.22
Sewer Line B	2447	V24052.A0-V24052.B0	V24052.A0-V24052.B0	15	15	0.507	0.13	0.24	0.507	0.13	0.24	1.491	0.38	0.43	1.491	0.38	0.43
	2446	V24052.B0-V24052.C0	V24052.B0-V24052.C0	18	18	0.523	0.05	0.15	0.523	0.05	0.15	1.545	0.14	0.25	1.545	0.14	0.25
	EC-P-186	-	-	18	18	0.757	0.09	0.20	0.757	0.09	0.20	2.008	0.24	0.34	2.008	0.24	0.34
	EC-P-187	-	-	18	18	0.757	0.09	0.20	0.757	0.09	0.20	2.014	0.24	0.34	2.014	0.24	0.34
	EC-P-189	-	-	18	18	0.757	0.09	0.21	0.757	0.09	0.21	2.015	0.25	0.34	2.015	0.25	0.34
	EC-P-190	-	-	18	18	0.757	0.09	0.20	0.757	0.09	0.20	2.019	0.25	0.34	2.019	0.25	0.34
	EC-P-191	-	-	18	18	0.757	0.09	0.20	0.757	0.09	0.20	2.019	0.24	0.34	2.019	0.24	0.34
	EC-P-192	-	-	18	18	0.783	0.13	0.24	0.819	0.14	0.25	2.144	0.35	0.41	2.174	0.36	0.41
	EC-P-193	-	-	18	18	0.783	0.14	0.25	0.819	0.14	0.25	2.144	0.37	0.42	2.174	0.38	0.43
Sewer Line A	EC-P-194	-	-	18	18	0.783	0.12	0.23	0.819	0.12	0.24	2.145	0.33	0.39	2.175	0.33	0.40
	EC-P-195	-	-	18	18	0.783	0.13	0.25	0.819	0.13	0.26	2.145	0.35	0.49	2.175	0.36	0.49
	EC-P-200	-	-	18	18	0.783	0.20	0.38	0.819	0.21	0.39	2.145	0.54	0.68	2.175	0.55	0.68
	EC-P-202	-	-	18	18	0.793	0.50	0.40	0.846	0.53	0.41	2.196	1.39	0.64	2.237	1.42	0.65
	5797	V24060-V24061	V24060.00-V24061.00	18	18	0.793	0.15	0.27	0.845	0.16	0.28	2.205	0.42	0.42	2.246	0.43	0.43
	5795	V24061-V24062	V24061.00-V24062.00	12	18	0.793	0.34	0.37	0.845	0.36	0.39	2.207	0.32	0.39	2.248	0.33	0.39
Reach 1	V24062-V24127	V24062-V24127	-	18	18	0.793	0.12	0.22	0.845	0.12	0.22	2.208	0.33	0.38	2.249	0.33	0.38
	V24127-V24072	V24127-V24072	-	18	18	0.793	0.07	0.23	0.846	0.08	0.23	2.208	0.21	0.39	2.249	0.21	0.40
	5786	V24072-V24089	V24072.00-V24089.00	18	18	0.793	0.12	0.19	0.845	0.12	0.20	2.208	0.32	0.32	2.249	0.33	0.32
	7229	V24089-V08163	V24089.00-V32T420.00	18	18	0.793	0.04	0.29	0.846	0.04	0.29	2.220	0.11	0.42	2.261	0.11	0.42
	FM2	V08163-V08162	V32T420.00-V32T419.0	27	27	3.315	0.19	0.29	3.365	0.19	0.29	6.136	0.34	0.40	6.178	0.35	0.41
	7791	V08162-V08161	V32T419.00-V32T418.0	27	27	3.315	0.19	0.29	3.365	0.19	0.29	6.136	0.34	0.40	6.178	0.35	0.41
	7777	V08161-V08160	V32T418.00-V32T417.0	27	27	3.317	0.18	0.29	3.367	0.18	0.29	6.167	0.34	0.41	6.208	0.34	0.41
	EC-P-172	-	-	27	27	3.317	0.18	0.30	3.367	0.18	0.30	6.169	0.33	0.43	6.210	0.33	0.43
	EC-P-173	-	-	27	27	3.345	0.21	0.33	3.396	0.21	0.33	6.222	0.39	0.46	6.263	0.39	0.47
	7774	V08158-V08157	V32T415.00-V32T414.0	27	27	3.345	0.26	0.34	3.396	0.26	0.34	6.222	0.48	0.48	6.263	0.49	0.48
	7771	V08157-V08156	V32T414.00-V32T413.0	27	27	3.345	0.23	0.34	3.396	0.23	0.34	6.235	0.43	0.48	6.276	0.43	0.49
	7770	V08156-V08155	V32T413.00-V32T412.0	27	27	3.345	0.26	0.36	3.396	0.27	0.36	6.235	0.49	0.50	6.276	0.49	0.51
	7769	V08155-V08154	V32T412.00-V32T411.0	27	27	3.345	0.28	0.36	3.396	0.28	0.36	6.237	0.52	0.51	6.278	0.52	0.51

Appendix A: Existing and Buildout PDWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	7768	V08154-V29142	V32T411.00-V32T410.0	27	27	3.345	0.28	0.36	3.396	0.28	0.36	6.264	0.52	0.51	6.305	0.52	0.51
	7767	V29142-V29141	V32T410.00-V32T409.0	27	27	3.345	0.27	0.35	3.396	0.27	0.36	6.287	0.51	0.50	6.328	0.51	0.50
Reach 2	7758	V29141-V29143	V32T409.00-V32T096.0	27	27	3.379	0.26	0.35	3.430	0.26	0.36	6.382	0.49	0.50	6.423	0.49	0.51
	7549	V29143-V29144	V32T096.00-V32T097.A	24	24	3.379	0.33	0.34	3.430	0.33	0.34	6.382	0.62	0.49	6.423	0.62	0.50
	7550	V29144-V29140	V32T097.A0-V32T395.0	21	21	3.379	0.21	0.38	3.430	0.22	0.39	6.382	0.41	0.55	6.423	0.41	0.56
	FM1	V29140-V29146	V32T395.00-V32T095.A	30	30	3.388	0.21	0.32	3.439	0.21	0.32	6.408	0.39	0.45	6.449	0.39	0.46
	7694	V29146-V29145	V32T095.A0-V32T094.0	30	30	3.388	0.23	0.32	3.439	0.24	0.33	6.408	0.44	0.46	6.450	0.45	0.46
	74	V29145-V29139	V32T094.00-V32T093.0	30	30	3.402	0.22	0.34	3.454	0.23	0.35	6.452	0.42	0.47	6.493	0.43	0.47
	73	V29139-V30069	V32T093.00-V32T092.0	30	36	3.456	0.28	0.38	3.507	0.28	0.39	6.537	0.33	0.41	6.578	0.33	0.41
	7369	V30069-V30071	V32T092.00-V32T092.B	30	36	3.456	3.88	0.36	3.507	3.94	0.36	6.538	4.51	0.39	6.579	4.54	0.39
	7370	V30071-V30070	V32T092.B0-V32T092.A	30	36	3.456	0.11	0.34	3.507	0.11	0.34	6.538	0.13	0.37	6.579	0.13	0.37
	7377	V30070-V30072	V32T092.A0-V32T091.0	30	36	3.741	0.29	0.36	3.792	0.29	0.36	7.028	0.33	0.39	7.069	0.34	0.39
	7382	V30072-V30073	V32T091.00-V32T090.0	30	36	3.741	0.28	0.34	3.792	0.28	0.35	7.028	0.32	0.37	7.069	0.32	0.37
	7383	V30073-V30079	V32T090.00-V32T089.0	30	36	3.743	0.26	0.33	3.794	0.26	0.33	7.028	0.30	0.35	7.069	0.30	0.35
	7385	V30079-V30074	V32T089.00-V32T088.0	30	36	3.743	1.56	0.31	3.794	1.58	0.31	7.028	1.80	0.34	7.069	1.81	0.34
	6855	V30074-V30078	V32T088.00-V32T087.A	30	36	3.743	0.20	0.37	3.794	0.20	0.38	7.028	0.23	0.40	7.069	0.23	0.40
	6856	V30078-V30076	V32T087.A0-V32T087.0	30	36	3.745	0.72	0.35	3.796	0.73	0.36	7.031	0.83	0.39	7.072	0.83	0.39
	7386	V30076-V30075	V32T087.00-V32T086.0	30	36	3.745	0.10	0.35	3.796	0.10	0.36	7.031	0.12	0.38	7.072	0.12	0.38
	7551	V30075-V30077	V32T086.00-V32T085.0	30	36	3.746	1.22	0.32	3.796	1.24	0.32	7.032	1.41	0.33	7.073	1.42	0.33
	7387	V30077-V30068	V32T085.00-V32T084.0	30	36	3.746	0.08	0.20	3.796	0.08	0.20	7.033	0.09	0.22	7.074	0.09	0.22
	7388	V30068-V32157	V32T084.00-V32T083.0	36	36	3.745	0.07	0.20	3.796	0.07	0.20	7.033	0.13	0.27	7.074	0.13	0.27
Reach 3	EC-P-166	-	-	36	36	3.751	0.10	0.28	3.801	0.10	0.28	7.043	0.19	0.38	7.084	0.19	0.39
	EC-P-165	-	-	36	36	6.282	0.21	0.36	6.334	0.21	0.36	11.169	0.37	0.50	11.210	0.37	0.51
	7393	V32158-V32159	V32T082.00-V32T081.0	36	36	6.321	0.31	0.37	6.373	0.32	0.37	11.253	0.56	0.51	11.294	0.56	0.51
	7395	V32159-V32160	V32T081.00-V32T080.0	36	36	6.320	0.27	0.37	6.372	0.28	0.37	11.253	0.49	0.51	11.294	0.49	0.51
	7396	V32160-V32161	V32T080.00-V32T079.0	36	36	6.445	0.30	0.37	6.497	0.30	0.37	11.433	0.53	0.49	11.474	0.53	0.49
	7397	V32161-V32162	V32T079.00-V32T078.0	36	36	6.445	0.27	0.26	6.497	0.27	0.26	11.434	0.47	0.34	11.475	0.47	0.34
	7398	V32162-V32163	V32T078.00-V32T077.0	36	36	6.515	0.05	0.19	6.567	0.05	0.19	11.721	0.10	0.25	11.762	0.10	0.26
	7400	V32163-V32164	V32T077.00-V32T076.0	36	36	6.515	0.11	0.29	6.567	0.11	0.29	11.721	0.19	0.40	11.762	0.19	0.40
	7401	V32164-V32165	V32T076.00-V32T075.0	36	36	6.516	0.28	0.36	6.568	0.29	0.37	11.728	0.51	0.50	11.769	0.51	0.50
	7402	V32165-V32166	V32T075.00-V32T074.0	36	36	6.557	0.28	0.35	6.609	0.29	0.35	11.728	0.51	0.48	11.769	0.51	0.48
	7403	V32166-V32167	V32T074.00-V32T073.0	36	36	6.557	0.24	0.31	6.609	0.24	0.32	11.728	0.43	0.43	11.769	0.43	0.43
Reach 4	7404	V32167-V32168	V32T073.00-V32T072.0	36	36	6.557	0.18	0.27	6.609	0.19	0.28	11.728	0.33	0.37	11.769	0.33	0.37
	7405	V32168-V32169	V32T072.00-V32T071.0	36	36	6.557	0.14	0.26	6.609	0.14	0.26	11.728	0.25	0.34	11.769	0.25	0.35
	7406	V32169-V32170	V32T071.00-V32T070.0	36	36	6.557	0.14	0.26	6.609	0.15	0.26	11.728	0.26	0.35	11.769	0.26	0.35

Appendix A: Existing and Buildout PDWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	7407	V32170-V32171	V32T070.00-V32T069.0	36	36	6.691	0.15	0.23	6.743	0.15	0.23	11.828	0.26	0.30	11.869	0.26	0.30
	7408	V32171-ABN_V32T068.0	V32T069.00-V32T068.0	36	36	6.691	0.07	0.28	6.743	0.08	0.28	11.828	0.13	0.38	11.869	0.13	0.38
	7409	ABN_V32T068.00-V3217	V32T068.00-V32T067.0	36	36	6.691	0.30	0.37	6.743	0.30	0.37	11.828	0.52	0.50	11.869	0.53	0.51
	7411	V32172-V32173	V32T067.00-V32T066.0	36	36	6.691	0.28	0.37	6.743	0.28	0.37	11.829	0.49	0.51	11.870	0.49	0.51
	7412	V32173-V32183	V32T066.00-V32T065.0	36	36	6.713	0.31	0.37	6.765	0.31	0.37	11.862	0.54	0.51	11.903	0.55	0.51
	7022	V32183-V32182	V32T065.00-V32T064.0	36	36	6.713	0.28	0.37	6.764	0.28	0.37	11.862	0.49	0.50	11.903	0.49	0.51
	7023	V32182-V32174	V32T064.00-V32T063.0	36	36	6.719	0.30	0.36	6.771	0.30	0.36	11.861	0.53	0.49	11.903	0.53	0.50
	7024	V32174-V32184	V32T063.00-V32T062.0	36	36	6.719	0.26	0.38	6.770	0.26	0.38	11.869	0.45	0.51	11.910	0.45	0.51
	7025	V32184-V01062	V32T062.00-V32T061.0	36	36	6.719	0.39	0.34	6.771	0.39	0.34	11.869	0.69	0.45	11.911	0.69	0.45
	7026	V01062-V32175	V32T061.00-V32T060.0	36	36	6.720	0.14	0.31	6.771	0.15	0.32	11.869	0.25	0.43	11.910	0.26	0.43
Reach 5	7027	V32175-V32176	V32T060.00-V32T059.0	36	36	6.719	0.29	0.45	6.771	0.30	0.45	11.869	0.52	0.59	11.910	0.52	0.59
	7028	V32176-V32177	V32T059.00-V32T058.0	36	36	6.719	10.24	0.38	6.771	10.31	0.39	11.869	18.08	0.50	11.911	18.14	0.50
	7029	V32177-V32178	V32T058.00-V32T057.0	36	36	6.719	0.13	0.26	6.771	0.13	0.26	11.869	0.22	0.35	11.910	0.23	0.35
	7030	V32178-V32179	V32T057.00-V32T056.0	36	36	6.720	0.18	0.33	6.772	0.18	0.33	11.869	0.31	0.45	11.910	0.31	0.45
	7032	V32T056.00-V32T055.0	-	36	36	6.720	0.30	0.37	6.771	0.30	0.37	11.869	0.52	0.50	11.910	0.52	0.50
	7033	V32T055.00-V32T054.0	-	36	36	6.720	0.29	0.30	6.771	0.30	0.30	11.869	0.52	0.40	11.910	0.52	0.40
	7034	V32T054.00-V32T053.0	-	36	36	6.720	0.13	0.30	6.771	0.13	0.30	11.869	0.22	0.40	11.910	0.23	0.40
	7035	V32T053.00-V32T052.0	-	36	36	6.720	0.27	0.34	6.771	0.27	0.34	11.869	0.48	0.46	11.910	0.48	0.46
	7036	V32T052.00-V32T051.0	-	36	36	6.720	0.21	0.26	6.771	0.21	0.26	11.869	0.36	0.34	11.910	0.36	0.34
	7037	V32T051.00-V32T050.0	-	36	36	6.720	0.08	0.19	6.771	0.08	0.19	11.869	0.14	0.25	11.910	0.14	0.25
	7444	V32T050.00-V32T049.0	-	36	36	6.720	0.07	0.27	6.771	0.07	0.27	11.869	0.13	0.37	11.910	0.13	0.37
	7445	V32T049.00-V32T048.0	-	36	36	6.720	0.29	0.37	6.771	0.29	0.37	11.869	0.51	0.51	11.910	0.51	0.51
	7446	V32T048.00-V32T047.0	-	36	36	6.720	0.30	0.37	6.771	0.30	0.37	11.869	0.52	0.51	11.910	0.52	0.51
	162	V32T047.00-V32T046.0	-	36	36	6.720	0.29	0.29	6.771	0.29	0.29	11.869	0.51	0.39	11.910	0.52	0.39
Reach 6	160	V32T046.00-V32T045.0	-	36	36	6.720	0.10	0.26	6.771	0.10	0.26	11.869	0.17	0.34	11.910	0.17	0.34
	158	V32T045.00-V32T044.0	-	36	36	7.563	0.21	0.25	7.615	0.21	0.25	13.124	0.37	0.33	13.165	0.37	0.33
	159	V32T044.00-V32T043.0	-	36	36	7.563	0.09	0.28	7.615	0.09	0.28	13.124	0.16	0.37	13.165	0.16	0.37
	157	V32T043.00-V32T042.0	-	36	36	7.563	0.24	0.26	7.615	0.24	0.26	13.124	0.41	0.35	13.165	0.41	0.35
	155	V32T042.00-V32T041.0	-	36	36	7.563	0.06	0.19	7.615	0.07	0.19	13.124	0.11	0.24	13.165	0.11	0.24
	154	V32T041.00-V32T040.0	-	36	36	7.563	0.09	0.27	7.615	0.09	0.27	13.124	0.15	0.36	13.165	0.15	0.36
	152	V32T040.00-V32T039.0	-	36	36	7.563	0.25	0.34	7.615	0.25	0.34	13.124	0.43	0.45	13.164	0.44	0.46
	151	V32T039.00-V32T038.0	-	36	36	7.563	0.22	0.26	7.615	0.22	0.27	13.124	0.38	0.35	13.164	0.38	0.35
	149	V32T038.00-V32T037.0	-	36	36	7.563	0.08	0.21	7.615	0.08	0.21	13.124	0.14	0.27	13.164	0.14	0.27
Reach 7	150	V32T037.00-V32T036.0	-	36	36	7.563	0.10	0.28	7.615	0.10	0.28	13.124	0.18	0.37	13.164	0.18	0.37
	148	V32T036.00-V32T035.0	-	36	36	7.563	0.23	0.27	7.615	0.23	0.28	13.124	0.39	0.36	13.164	0.39	0.36

Appendix A: Existing and Buildout PDWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
Reach 8	147	V32T035.00-V32T034.0	-	36	36	7.563	0.10	0.28	7.615	0.10	0.28	13.123	0.17	0.38	13.164	0.17	0.38
	146	V32T034.00-V32T033.0	-	36	36	7.563	0.26	0.35	7.614	0.26	0.36	13.123	0.46	0.48	13.163	0.46	0.48
	145	V32T033.00-V32T032.0	-	36	36	7.563	0.28	0.36	7.614	0.28	0.36	13.123	0.48	0.48	13.163	0.48	0.48
	V1	V1	-	36	36	7.563	0.26	0.33	7.614	0.27	0.33	13.123	0.46	0.44	13.163	0.46	0.44
	143	V32T031.00-V32T030.0	-	36	36	7.563	0.18	0.26	7.614	0.18	0.26	13.123	0.31	0.34	13.163	0.31	0.35
	142	V32T030.00-V32T029.0	-	36	36	7.563	0.11	0.31	7.614	0.11	0.31	13.123	0.19	0.40	13.163	0.19	0.40
	141	V32T029.00-V32T028.0	-	42	42	7.563	0.24	0.33	7.614	0.25	0.33	13.123	0.42	0.42	13.163	0.42	0.43
	139	V32T028.00-V32T027.A	-	42	42	7.563	3.20	0.28	7.614	3.22	0.28	13.123	5.54	0.37	13.163	5.56	0.37
	138	V32T027.A0-V32T027.0	-	42	42	7.563	0.13	0.26	7.614	0.13	0.26	13.123	0.23	0.35	13.163	0.23	0.35
	137	V32T027.00-V32T026.0	-	42	42	7.562	0.17	0.28	7.614	0.17	0.29	13.123	0.29	0.38	13.163	0.29	0.38
	136	V32T026.00-V32T025.0	-	42	42	7.562	0.19	0.31	7.614	0.19	0.31	13.123	0.33	0.41	13.163	0.33	0.41
	135	V32T025.00-V32T024.0	-	42	42	7.562	0.23	0.31	7.614	0.23	0.31	13.123	0.40	0.41	13.163	0.40	0.41
	134	V32T024.00-V32T023.0	-	42	42	7.562	0.19	0.33	7.614	0.19	0.33	13.123	0.33	0.44	13.163	0.33	0.44
	133	V32T023.00-V32T022.A	-	42	42	7.562	0.30	0.33	7.613	0.31	0.33	13.123	0.53	0.44	13.163	0.53	0.44
	132	V32T022.A0-V32T022.0	-	42	42	7.562	0.19	0.29	7.613	0.19	0.30	13.123	0.33	0.39	13.163	0.33	0.39
	131	V32T022.00-V32T021.0	-	42	42	7.562	0.19	0.29	7.613	0.19	0.29	13.123	0.32	0.39	13.163	0.32	0.39
	8273	V32T021.A0-V32T021.0	-	36	36	7.562	2.53	0.33	7.613	2.55	0.33	13.123	4.39	0.43	13.163	4.40	0.43
	127	V32T021.00-V32T019.0	-	36	36	7.562	0.21	0.37	7.613	0.21	0.37	13.123	0.36	0.51	13.163	0.36	0.51
	128	V32T019.00-V32T018.0	-	36	36	7.562	0.39	0.43	7.613	0.40	0.44	13.123	0.68	0.60	13.163	0.68	0.61
	126	V32T018.00-V32T017.0	-	36	36	7.561	0.39	0.44	7.613	0.39	0.44	13.123	0.68	0.61	13.163	0.68	0.61
	125	V32T017.00-V32T016.0	-	36	36	7.561	0.40	0.43	7.613	0.40	0.43	13.122	0.69	0.60	13.163	0.69	0.60
	124	V32T016.00-V32T015.0	-	36	36	7.561	0.38	0.43	7.613	0.38	0.44	13.122	0.65	0.60	13.163	0.65	0.60
	123	V32T015.00-V32T014.0	-	36	36	7.561	0.40	0.44	7.612	0.41	0.44	13.122	0.70	0.61	13.163	0.70	0.61
	122	V32T014.00-V32T013.0	-	36	36	7.561	0.39	0.43	7.612	0.39	0.43	13.122	0.68	0.59	13.163	0.68	0.59
	120	V32T013.00-V32T012.0	-	36	36	7.561	0.40	0.38	7.612	0.40	0.39	13.122	0.69	0.52	13.162	0.69	0.52
	163	V32T012.00-V32T011.0	-	36	36	7.561	0.25	0.40	7.612	0.25	0.40	13.122	0.43	0.53	13.162	0.43	0.53
	829	V32T011.00-V32T010.0	-	36	36	7.561	5.65	0.41	7.612	5.69	0.41	13.122	9.81	0.54	13.162	9.84	0.54

Yellow Cells Indicate criteria failure for either maximum q/Q (> 1.00) or d/D (>0.80). Only a combination of criteria failure for both q/Q and d/D would result in a recommended upgrade.

Orange Cells Indicate improvements related to CIP 8289 and CIP 8291

Appendix B
Existing & Buildout Peak Wet Weather Flow Model Results Tables

Appendix B: Existing and Buildout PWWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
Sewer Line F	5961	V28137-V28138	V28137.00-V28138.00	12	12	0.439	0.14	0.25	0.439	0.14	0.25	0.666	0.21	0.32	0.666	0.21	0.32
	EC-P-237	-	-	12	12	0.439	0.15	0.26	0.439	0.15	0.26	0.668	0.23	0.36	0.668	0.23	0.36
	EC-P-186	-	-	18	18	1.585	0.19	0.30	1.586	0.19	0.30	2.836	0.34	0.40	2.836	0.34	0.40
Sewer Line E	EC-P-232	-	-	8	8	0.0216	0.01	0.08	0.0216	0.01	0.08	0.0186	0.01	0.08	0.0186	0.01	0.08
	EC-P-234	-	-	8	8	0.0221	0.01	0.06	0.0221	0.01	0.06	0.0190	0.01	0.06	0.0190	0.01	0.06
	EC-P-230	-	-	8	8	0.0237	0.01	0.06	0.0237	0.01	0.06	0.0202	0.01	0.06	0.0202	0.01	0.06
	EC-P-229	-	-	8	8	0.0237	0.01	0.08	0.0237	0.01	0.08	0.0202	0.01	0.07	0.0202	0.01	0.07
	EC-P-231	-	-	8	8	0.0424	0.01	0.08	0.0424	0.01	0.08	0.0467	0.01	0.08	0.0467	0.01	0.08
	EC-P-209	-	-	8	8	0.0517	0.06	0.17	0.0517	0.06	0.17	0.0745	0.09	0.20	0.0745	0.09	0.20
	EC-P-210	-	-	8	8	0.0516	0.06	0.17	0.0516	0.06	0.17	0.0745	0.09	0.20	0.0745	0.09	0.20
Sewer Line D3	2455	V24054.P0-V24054.Q0	V24054.P0-V24054.Q0	8	8	0.0104	0.01	0.09	0.0104	0.01	0.09	0.0323	0.04	0.15	0.0323	0.04	0.15
	5799	V24054.Q0-V24054	V24054.Q0-V24054.00	8	8	0.0145	0.02	0.09	0.0145	0.02	0.09	0.0417	0.05	0.15	0.0417	0.05	0.15
	EC-P-240	-	-	8	8	0.0161	0.02	0.09	0.0161	0.02	0.09	0.0507	0.05	0.15	0.0507	0.05	0.15
	EC-P-218	-	-	8	8	0.0161	0.01	0.06	0.0161	0.01	0.06	0.0507	0.02	0.10	0.0507	0.02	0.10
	EC-P-223	-	-	8	8	0.0132	0.08	0.15	0.0216	0.13	0.19	0.0084	0.03	0.21	0.0129	0.04	0.23
	5798	V24055-V24056	V24055.00-V24056.00	8	8	0.0165	0.02	0.20	0.0248	0.03	0.25	0.0115	0.01	0.23	0.0161	0.02	0.25
	2459	V24056-V24057	V24056.00-V24057.00	12	12	0.0323	0.06	0.13	0.0504	0.10	0.16	0.0527	0.10	0.17	0.0647	0.13	0.18
Sewer Line D2	5700	V28141-V28142	V28141.00-V28142.00	8	8	0.0107	0.02	0.09	0.0107	0.02	0.09	0.0436	0.07	0.18	0.0436	0.07	0.18
	EC-P-239	-	-	8	8	0.0145	0.01	0.07	0.0145	0.01	0.07	0.0532	0.05	0.13	0.0532	0.05	0.13
	EC-P-220	-	-	8	8	0.0145	0.00	0.04	0.0145	0.00	0.04	0.0532	0.01	0.08	0.0532	0.01	0.08
	EC-P-222	-	-	8	8	0.0140	0.02	0.10	0.0238	0.04	0.13	0.0276	0.04	0.14	0.0351	0.05	0.16
	6959	V28167-V24056	V28167.00-V24056.00	8	8	0.0154	0.01	0.20	0.0252	0.02	0.24	0.0355	0.03	0.25	0.0431	0.03	0.27
	2459	V24056-V24057	V24056.00-V24057.00	12	12	0.0323	0.06	0.13	0.0504	0.10	0.16	0.0527	0.10	0.17	0.0647	0.13	0.18
Sewer Line D	5699	V28164-V28165	V28164.00-V28165.00	8	8	0.0586	0.03	0.11	0.112	0.05	0.14	0.0857	0.04	0.13	0.127	0.05	0.15
	EC-P-213	-	-	8	8	0.0597	0.02	0.10	0.113	0.04	0.13	0.0945	0.03	0.12	0.136	0.05	0.15
	EC-P-214	-	-	8	8	0.0635	0.02	0.10	0.107	0.04	0.13	0.124	0.04	0.14	0.157	0.05	0.16
	EC-P-215	-	-	8	8	0.0635	0.09	0.21	0.107	0.16	0.27	0.124	0.18	0.29	0.157	0.23	0.33
	EC-P-216	-	-	8	8	0.0663	0.10	0.36	0.102	0.15	0.39	0.166	0.25	0.58	0.195	0.29	0.60
	EC-P-192	-	-	18	18	1.680	0.28	0.36	1.715	0.28	0.36	3.042	0.50	0.50	3.071	0.51	0.50
Sewer Line C	EC-P-203	-	-	8	8	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00
	EC-P-204	-	-	8	8	0.0009	0.00	0.03	0.0009	0.00	0.03	0.0048	0.00	0.06	0.0048	0.00	0.06
	EC-P-205	-	-	8	8	0.0023	0.00	0.04	0.0023	0.00	0.04	0.0132	0.01	0.08	0.0132	0.01	0.08
	EC-P-206	-	-	8	8	0.0039	0.00	0.05	0.0039	0.00	0.05	0.0186	0.02	0.10	0.0186	0.02	0.10
	EC-P-207	-	-	8	8	0.0039	0.00	0.05	0.0039	0.00	0.05	0.0186	0.02	0.10	0.0186	0.02	0.10
	EC-P-208	-	-	8	8	0.0039	0.00	0.05	0.0039	0.00	0.05	0.0186	0.02	0.10	0.0186	0.02	0.10

Appendix B: Existing and Buildout PWWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	EC-P-209	-	-	8	8	0.0517	0.06	0.17	0.0517	0.06	0.17	0.0745	0.09	0.20	0.0745	0.09	0.20
	EC-P-210	-	-	8	8	0.0516	0.06	0.17	0.0516	0.06	0.17	0.0745	0.09	0.20	0.0745	0.09	0.20
	EC-P-211	-	-	8	8	0.0543	0.06	0.17	0.0543	0.06	0.17	0.0772	0.09	0.20	0.0772	0.09	0.20
	EC-P-212	-	-	8	8	0.0556	0.09	0.20	0.0556	0.09	0.20	0.0833	0.13	0.24	0.0833	0.13	0.24
	V24117-V24118	V24117-V24118	-	8	8	0.0558	0.07	0.19	0.0558	0.07	0.19	0.0844	0.11	0.24	0.0844	0.11	0.24
	V24118-V24119	V24118-V24119	-	8	8	0.0726	0.09	0.21	0.0726	0.09	0.21	0.118	0.15	0.27	0.118	0.15	0.27
	V24119-V24120	V24119-V24120	-	8	8	0.0732	0.10	0.21	0.0732	0.10	0.21	0.119	0.16	0.26	0.119	0.16	0.26
Sewer Line B	2447	V24052.A0-V24052.B0	V24052.A0-V24052.B0	15	15	1.114	0.29	0.37	1.114	0.29	0.37	2.099	0.54	0.52	2.099	0.54	0.52
	2446	V24052.B0-V24052.C0	V24052.B0-V24052.C0	18	18	1.145	0.10	0.22	1.146	0.10	0.22	2.167	0.20	0.30	2.167	0.20	0.30
	EC-P-186	-	-	18	18	1.585	0.19	0.30	1.586	0.19	0.30	2.836	0.34	0.40	2.836	0.34	0.40
	EC-P-187	-	-	18	18	1.591	0.19	0.30	1.591	0.19	0.30	2.847	0.35	0.41	2.847	0.35	0.41
	EC-P-189	-	-	18	18	1.597	0.20	0.30	1.597	0.20	0.30	2.853	0.35	0.41	2.853	0.35	0.41
	EC-P-190	-	-	18	18	1.603	0.19	0.30	1.603	0.19	0.30	2.863	0.35	0.41	2.863	0.35	0.41
	EC-P-191	-	-	18	18	1.609	0.19	0.30	1.609	0.19	0.30	2.869	0.35	0.41	2.869	0.35	0.41
	EC-P-192	-	-	18	18	1.680	0.28	0.36	1.715	0.28	0.36	3.042	0.50	0.50	3.071	0.51	0.50
	EC-P-193	-	-	18	18	1.680	0.29	0.37	1.715	0.30	0.37	3.042	0.53	0.52	3.071	0.53	0.52
Sewer Line A	EC-P-194	-	-	18	18	1.680	0.26	0.34	1.715	0.26	0.35	3.043	0.46	0.48	3.072	0.47	0.48
	EC-P-195	-	-	18	18	1.688	0.28	0.42	1.723	0.28	0.43	3.051	0.50	0.62	3.080	0.50	0.63
	EC-P-200	-	-	18	18	1.688	0.43	0.59	1.723	0.43	0.60	3.051	0.77	0.84	3.080	0.78	0.85
	EC-P-202	-	-	18	18	1.728	1.09	0.57	1.781	1.13	0.58	3.128	1.98	0.77	3.169	2.00	0.78
	5797	V24060-V24061	V24060.00-V24061.00	18	18	1.733	0.33	0.42	1.786	0.34	0.42	3.141	0.60	0.52	3.182	0.61	0.52
	5795	V24061-V24062	V24061.00-V24062.00	12	18	1.736	0.75	0.58	1.788	0.77	0.59	3.146	0.46	0.47	3.187	0.47	0.48
Reach 1	V24062-V24127	V24062-V24127	-	18	18	1.738	0.26	0.33	1.790	0.26	0.33	3.148	0.46	0.46	3.189	0.47	0.47
	V24127-V24072	V24127-V24072	-	18	18	1.738	0.16	0.35	1.791	0.17	0.35	3.148	0.29	0.48	3.190	0.30	0.49
	5786	V24072-V24089	V24072.00-V24089.00	18	18	1.738	0.25	0.28	1.791	0.26	0.29	3.149	0.46	0.39	3.190	0.46	0.39
	7229	V24089-V08163	V24089.00-V32T420.00	18	18	1.746	0.09	0.42	1.798	0.09	0.42	3.168	0.16	0.53	3.209	0.16	0.53
	FM2	V08163-V08162	V32T420.00-V32T419.0	27	27	6.834	0.38	0.43	6.881	0.39	0.43	9.628	0.54	0.53	9.669	0.54	0.53
	7791	V08162-V08161	V32T419.00-V32T418.0	27	27	6.846	0.38	0.43	6.893	0.38	0.43	9.639	0.54	0.53	9.680	0.54	0.53
	7777	V08161-V08160	V32T418.00-V32T417.0	27	27	6.862	0.38	0.43	6.908	0.38	0.43	9.683	0.53	0.54	9.723	0.53	0.54
	EC-P-172	-	-	27	27	6.863	0.37	0.45	6.910	0.37	0.45	9.685	0.52	0.56	9.726	0.52	0.56
	EC-P-173	-	-	27	27	6.906	0.43	0.49	6.954	0.44	0.50	9.754	0.61	0.61	9.795	0.62	0.61
	7774	V08158-V08157	V32T415.00-V32T414.0	27	27	6.913	0.54	0.51	6.961	0.54	0.51	9.761	0.76	0.64	9.802	0.76	0.64
	7771	V08157-V08156	V32T414.00-V32T413.0	27	27	6.919	0.48	0.52	6.967	0.48	0.52	9.779	0.68	0.65	9.820	0.68	0.65
	7770	V08156-V08155	V32T413.00-V32T412.0	27	27	6.921	0.54	0.54	6.969	0.55	0.54	9.781	0.77	0.67	9.822	0.77	0.68
	7769	V08155-V08154	V32T412.00-V32T411.0	27	27	6.926	0.58	0.54	6.974	0.58	0.55	9.788	0.81	0.68	9.829	0.82	0.69

Appendix B: Existing and Buildout PWWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	7768	V08154-V29142	V32T411.00-V32T410.0	27	27	6.933	0.57	0.54	6.981	0.58	0.54	9.821	0.81	0.68	9.862	0.82	0.68
	7767	V29142-V29141	V32T410.00-V32T409.0	27	27	6.940	0.56	0.53	6.988	0.57	0.53	9.852	0.80	0.67	9.893	0.80	0.67
Reach 2	7758	V29141-V29143	V32T409.00-V32T096.0	27	27	7.024	0.54	0.53	7.071	0.54	0.54	9.995	0.77	0.68	10.036	0.77	0.68
	7549	V29143-V29144	V32T096.00-V32T097.A	24	24	7.028	0.68	0.52	7.076	0.69	0.53	9.999	0.97	0.67	10.040	0.98	0.67
	7550	V29144-V29140	V32T097.A0-V32T395.0	21	21	7.037	0.45	0.59	7.085	0.45	0.59	10.008	0.64	0.74	10.049	0.64	0.75
	FM1	V29140-V29146	V32T395.00-V32T095.A	30	30	7.061	0.43	0.48	7.109	0.43	0.48	10.048	0.61	0.60	10.089	0.61	0.60
	7694	V29146-V29145	V32T095.A0-V32T094.0	30	30	7.063	0.49	0.48	7.111	0.49	0.49	10.051	0.70	0.60	10.092	0.70	0.60
	74	V29145-V29139	V32T094.00-V32T093.0	30	30	7.125	0.47	0.53	7.172	0.47	0.53	10.141	0.67	0.61	10.182	0.67	0.61
	73	V29139-V30069	V32T093.00-V32T092.0	30	36	7.344	0.60	0.59	7.391	0.60	0.59	10.392	0.52	0.54	10.432	0.52	0.54
	7369	V30069-V30071	V32T092.00-V32T092.B	30	36	7.349	8.25	0.56	7.396	8.30	0.56	10.398	7.18	0.51	10.439	7.21	0.51
	7370	V30071-V30070	V32T092.B0-V32T092.A	30	36	7.352	0.24	0.54	7.399	0.24	0.54	10.401	0.21	0.49	10.442	0.21	0.50
	7377	V30070-V30072	V32T092.A0-V32T091.0	30	36	8.071	0.62	0.56	8.118	0.63	0.56	11.315	0.54	0.51	11.356	0.54	0.51
	7382	V30072-V30073	V32T091.00-V32T090.0	30	36	8.093	0.60	0.53	8.139	0.61	0.53	11.337	0.52	0.48	11.378	0.52	0.48
	7383	V30073-V30079	V32T090.00-V32T089.0	30	36	8.104	0.56	0.51	8.151	0.56	0.51	11.348	0.48	0.47	11.389	0.48	0.47
	7385	V30079-V30074	V32T089.00-V32T088.0	30	36	8.107	3.38	0.49	8.153	3.40	0.49	11.350	2.91	0.46	11.391	2.92	0.46
	6855	V30074-V30078	V32T088.00-V32T087.A	30	36	8.107	0.43	0.58	8.154	0.43	0.58	11.351	0.37	0.52	11.392	0.37	0.53
	6856	V30078-V30076	V32T087.A0-V32T087.0	30	36	8.116	1.56	0.56	8.163	1.57	0.56	11.361	1.34	0.51	11.402	1.35	0.51
	7386	V30076-V30075	V32T087.00-V32T086.0	30	36	8.124	0.22	0.55	8.170	0.22	0.55	11.368	0.19	0.50	11.409	0.19	0.50
	7551	V30075-V30077	V32T086.00-V32T085.0	30	36	8.124	2.65	0.46	8.171	2.67	0.46	11.370	2.28	0.42	11.411	2.29	0.42
	7387	V30077-V30068	V32T085.00-V32T084.0	30	36	8.137	0.17	0.30	8.183	0.17	0.30	11.383	0.15	0.29	11.424	0.15	0.29
	7388	V30068-V32157	V32T084.00-V32T083.0	36	36	8.138	0.15	0.29	8.185	0.15	0.29	11.384	0.21	0.34	11.425	0.21	0.35
Reach 3	EC-P-166	-	-	36	36	8.172	0.22	0.42	8.219	0.22	0.42	11.423	0.30	0.51	11.464	0.30	0.51
	EC-P-165	-	-	36	36	12.594	0.42	0.54	12.642	0.42	0.54	17.401	0.58	0.68	17.442	0.58	0.68
	7393	V32158-V32159	V32T082.00-V32T081.0	36	36	12.698	0.63	0.55	12.747	0.63	0.55	17.550	0.87	0.68	17.591	0.87	0.68
	7395	V32159-V32160	V32T081.00-V32T080.0	36	36	12.713	0.55	0.54	12.762	0.55	0.54	17.565	0.76	0.67	17.606	0.76	0.67
	7396	V32160-V32161	V32T080.00-V32T079.0	36	36	12.920	0.60	0.53	12.969	0.60	0.53	17.825	0.82	0.64	17.866	0.82	0.64
	7397	V32161-V32162	V32T079.00-V32T078.0	36	36	12.939	0.53	0.36	12.988	0.53	0.36	17.846	0.73	0.43	17.887	0.74	0.43
	7398	V32162-V32163	V32T078.00-V32T077.0	36	36	13.134	0.11	0.27	13.183	0.11	0.27	18.255	0.15	0.32	18.297	0.15	0.32
	7400	V32163-V32164	V32T077.00-V32T076.0	36	36	13.140	0.22	0.43	13.189	0.22	0.43	18.262	0.30	0.52	18.303	0.30	0.52
	7401	V32164-V32165	V32T076.00-V32T075.0	36	36	13.146	0.57	0.54	13.195	0.57	0.54	18.274	0.80	0.66	18.315	0.80	0.66
	7402	V32165-V32166	V32T075.00-V32T074.0	36	36	13.197	0.57	0.51	13.246	0.57	0.51	18.284	0.79	0.62	18.325	0.79	0.62
	7403	V32166-V32167	V32T074.00-V32T073.0	36	36	13.209	0.49	0.46	13.258	0.49	0.46	18.296	0.67	0.55	18.337	0.68	0.55
Reach 4	7404	V32167-V32168	V32T073.00-V32T072.0	36	36	13.223	0.37	0.40	13.272	0.37	0.40	18.310	0.51	0.47	18.351	0.51	0.47
	7405	V32168-V32169	V32T072.00-V32T071.0	36	36	13.240	0.29	0.37	13.289	0.29	0.37	18.327	0.39	0.44	18.368	0.40	0.44
	7406	V32169-V32170	V32T071.00-V32T070.0	36	36	13.244	0.29	0.38	13.293	0.29	0.38	18.331	0.40	0.45	18.372	0.40	0.45

Appendix B: Existing and Buildout PWWF Model Results Tables

Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	7407	V32170-V32171	V32T070.00-V32T069.0	36	36	13.517	0.30	0.32	13.566	0.30	0.32	18.567	0.41	0.38	18.608	0.41	0.38
	7408	V32171-ABN_V32T068.0	V32T069.00-V32T068.0	36	36	13.524	0.15	0.41	13.573	0.15	0.41	18.575	0.21	0.50	18.616	0.21	0.50
	7409	ABN_V32T068.00-V3217	V32T068.00-V32T067.0	36	36	13.540	0.60	0.55	13.589	0.60	0.55	18.590	0.83	0.68	18.631	0.83	0.68
	7411	V32172-V32173	V32T067.00-V32T066.0	36	36	13.555	0.56	0.56	13.604	0.57	0.56	18.607	0.77	0.69	18.648	0.78	0.69
	7412	V32173-V32183	V32T066.00-V32T065.0	36	36	13.632	0.63	0.56	13.681	0.63	0.56	18.695	0.86	0.69	18.736	0.86	0.69
	7022	V32183-V32182	V32T065.00-V32T064.0	36	36	13.652	0.56	0.55	13.701	0.56	0.55	18.715	0.77	0.68	18.756	0.77	0.68
	7023	V32182-V32174	V32T064.00-V32T063.0	36	36	13.674	0.61	0.54	13.723	0.61	0.54	18.730	0.83	0.66	18.772	0.84	0.66
	7024	V32174-V32184	V32T063.00-V32T062.0	36	36	13.692	0.52	0.56	13.741	0.52	0.56	18.757	0.72	0.68	18.798	0.72	0.68
	7025	V32184-V01062	V32T062.00-V32T061.0	36	36	13.714	0.79	0.49	13.763	0.79	0.49	18.779	1.08	0.58	18.820	1.09	0.58
	7026	V01062-V32175	V32T061.00-V32T060.0	36	36	13.735	0.29	0.47	13.784	0.30	0.47	18.799	0.40	0.57	18.840	0.40	0.57
Reach 5	7027	V32175-V32176	V32T060.00-V32T059.0	36	36	13.747	0.60	0.64	13.796	0.60	0.64	18.810	0.82	0.79	18.851	0.83	0.79
	7028	V32176-V32177	V32T059.00-V32T058.0	36	36	13.768	20.97	0.54	13.817	21.05	0.54	18.831	28.68	0.65	18.872	28.75	0.65
	7029	V32177-V32178	V32T058.00-V32T057.0	36	36	13.785	0.26	0.38	13.834	0.26	0.38	18.848	0.36	0.45	18.889	0.36	0.45
	7030	V32178-V32179	V32T057.00-V32T056.0	36	36	13.802	0.36	0.49	13.851	0.36	0.49	18.865	0.49	0.59	18.906	0.49	0.59
	7032	V32T056.00-V32T055.0	-	36	36	13.819	0.61	0.54	13.868	0.61	0.54	18.882	0.83	0.65	18.923	0.83	0.65
	7033	V32T055.00-V32T054.0	-	36	36	13.836	0.61	0.43	13.885	0.61	0.44	18.899	0.83	0.51	18.940	0.83	0.52
	7034	V32T054.00-V32T053.0	-	36	36	13.847	0.26	0.44	13.896	0.26	0.44	18.910	0.36	0.53	18.951	0.36	0.53
	7035	V32T053.00-V32T052.0	-	36	36	13.860	0.56	0.50	13.909	0.56	0.50	18.922	0.76	0.60	18.963	0.76	0.60
	7036	V32T052.00-V32T051.0	-	36	36	13.878	0.43	0.37	13.927	0.43	0.37	18.941	0.58	0.44	18.982	0.58	0.44
	7037	V32T051.00-V32T050.0	-	36	36	13.892	0.17	0.27	13.941	0.17	0.27	18.955	0.23	0.32	18.996	0.23	0.32
	7444	V32T050.00-V32T049.0	-	36	36	13.910	0.15	0.41	13.959	0.15	0.41	18.972	0.20	0.50	19.014	0.20	0.50
	7445	V32T049.00-V32T048.0	-	36	36	13.924	0.59	0.56	13.973	0.60	0.56	18.986	0.81	0.69	19.027	0.81	0.69
	7446	V32T048.00-V32T047.0	-	36	36	13.931	0.61	0.55	13.980	0.62	0.55	18.993	0.84	0.67	19.035	0.84	0.67
	162	V32T047.00-V32T046.0	-	36	36	13.949	0.60	0.42	13.998	0.61	0.42	19.012	0.82	0.50	19.053	0.82	0.50
Reach 6	160	V32T046.00-V32T045.0	-	36	36	13.966	0.20	0.37	14.016	0.20	0.37	19.029	0.27	0.44	19.070	0.27	0.44
	158	V32T045.00-V32T044.0	-	36	36	15.860	0.44	0.37	15.936	0.44	0.37	21.977	0.61	0.45	21.970	0.61	0.45
	159	V32T044.00-V32T043.0	-	36	36	15.864	0.19	0.41	15.950	0.19	0.41	22.639	0.27	0.50	22.616	0.27	0.50
	157	V32T043.00-V32T042.0	-	36	36	15.866	0.50	0.39	15.944	0.50	0.39	22.225	0.70	0.47	22.216	0.70	0.47
	155	V32T042.00-V32T041.0	-	36	36	15.887	0.14	0.27	15.964	0.14	0.27	22.149	0.19	0.32	22.140	0.19	0.32
	154	V32T041.00-V32T040.0	-	36	36	15.908	0.18	0.40	15.983	0.18	0.40	22.087	0.25	0.48	22.078	0.25	0.48
	152	V32T040.00-V32T039.0	-	36	36	15.923	0.53	0.51	15.989	0.53	0.51	21.757	0.72	0.61	21.775	0.72	0.61
	151	V32T039.00-V32T038.0	-	36	36	15.946	0.46	0.39	16.007	0.46	0.39	21.616	0.63	0.46	21.642	0.63	0.46
	149	V32T038.00-V32T037.0	-	36	36	15.966	0.17	0.30	16.026	0.17	0.30	21.625	0.23	0.35	21.652	0.23	0.35
Reach 7	150	V32T037.00-V32T036.0	-	36	36	15.975	0.22	0.41	16.034	0.22	0.41	21.620	0.29	0.49	21.648	0.30	0.49
	148	V32T036.00-V32T035.0	-	36	36	15.991	0.48	0.41	16.048	0.48	0.41	21.561	0.64	0.48	21.595	0.64	0.48

Appendix B: Existing and Buildout PWWF Model Results Tables

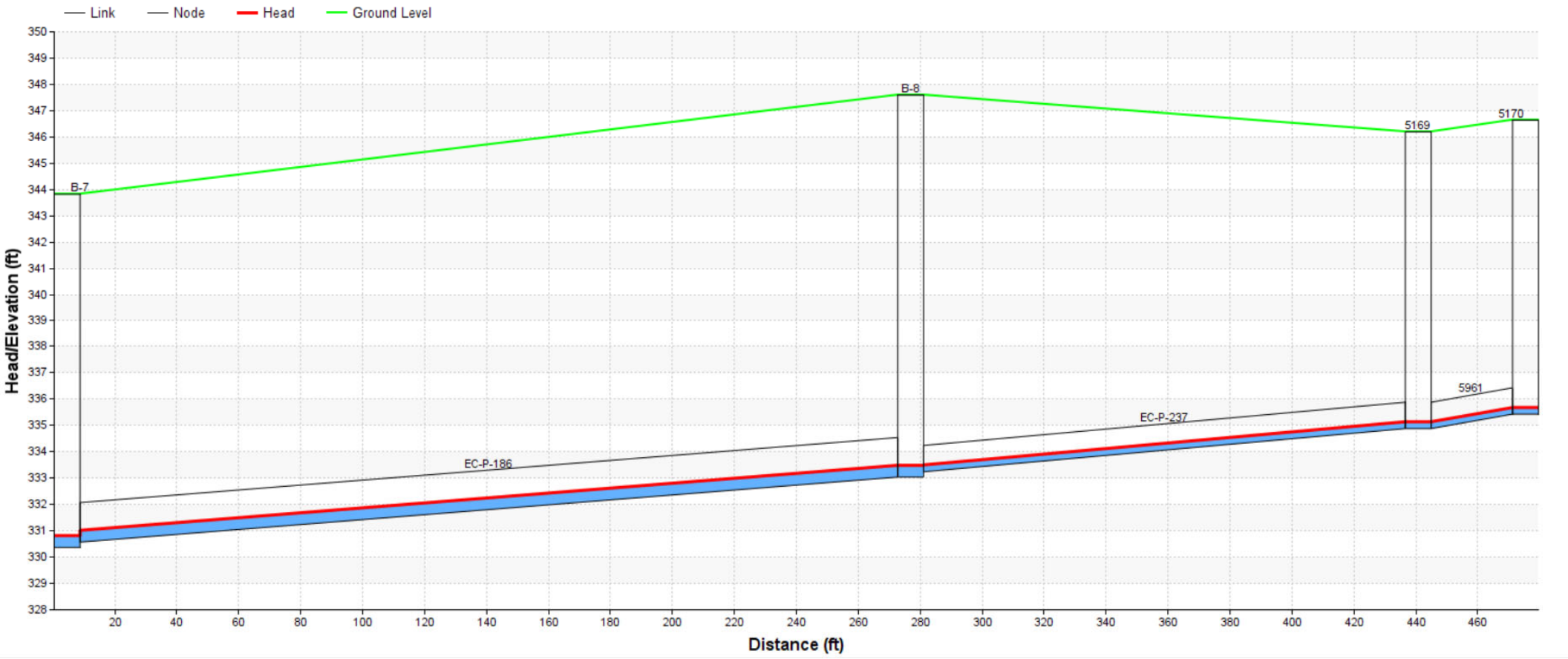
Analysis Reach	Model ID	Asset ID	Legacy ID	Diameter (in)		Existing System + CIP 8289, CIP 8291						Existing System + CIP 8289, CIP 8292 + Master Plan CIP Projects					
						Existing System Flow Loading			Existing System Flow Loading + Kenosha Development Flows			Buildout Flow Loading			Buildout Flow Loading + Kenosha Development Flows		
				Existing	Buildout	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)	Maximum Flow (mgd)	Max Flow/ Full Flow (q/Q)	Max Depth/ Full Depth (d/D)
	147	V32T035.00-V32T034.0	-	36	36	16.013	0.20	0.42	16.069	0.20	0.42	21.566	0.27	0.50	21.600	0.27	0.50
	146	V32T034.00-V32T033.0	-	36	36	16.030	0.56	0.54	16.084	0.56	0.54	21.538	0.75	0.66	21.574	0.75	0.66
	145	V32T033.00-V32T032.0	-	36	36	16.048	0.59	0.54	16.100	0.59	0.54	21.526	0.79	0.65	21.565	0.79	0.65
	V1	V1	-	36	36	16.066	0.56	0.49	16.118	0.56	0.49	21.530	0.75	0.58	21.569	0.75	0.58
	143	V32T031.00-V32T030.0	-	36	36	16.084	0.38	0.38	16.136	0.39	0.38	21.544	0.51	0.45	21.583	0.52	0.45
	142	V32T030.00-V32T029.0	-	36	36	16.084	0.23	0.45	16.135	0.23	0.45	21.541	0.31	0.52	21.581	0.31	0.53
	141	V32T029.00-V32T028.0	-	42	42	16.084	0.52	0.47	16.135	0.52	0.47	21.538	0.69	0.55	21.578	0.69	0.55
	139	V32T028.00-V32T027.A	-	42	42	16.084	6.80	0.41	16.135	6.82	0.41	21.539	9.10	0.47	21.579	9.12	0.47
	138	V32T027.A0-V32T027.0	-	42	42	16.084	0.28	0.39	16.135	0.28	0.39	21.538	0.38	0.46	21.578	0.38	0.46
	137	V32T027.00-V32T026.0	-	42	42	16.084	0.35	0.43	16.135	0.35	0.43	21.536	0.47	0.50	21.576	0.47	0.50
	136	V32T026.00-V32T025.0	-	42	42	16.084	0.40	0.46	16.134	0.40	0.46	21.530	0.54	0.54	21.570	0.54	0.54
	135	V32T025.00-V32T024.0	-	42	42	16.084	0.49	0.46	16.134	0.49	0.46	21.529	0.65	0.54	21.569	0.66	0.54
	134	V32T024.00-V32T023.0	-	42	42	16.084	0.40	0.49	16.133	0.40	0.49	21.527	0.54	0.58	21.567	0.54	0.58
	133	V32T023.00-V32T022.A	-	42	42	16.084	0.65	0.49	16.133	0.65	0.49	21.525	0.87	0.58	21.565	0.87	0.58
	132	V32T022.A0-V32T022.0	-	42	42	16.084	0.41	0.44	16.133	0.41	0.44	21.525	0.54	0.52	21.565	0.55	0.52
	131	V32T022.00-V32T021.0	-	42	42	16.084	0.40	0.43	16.133	0.40	0.43	21.525	0.53	0.51	21.565	0.53	0.51
	8273	V32T021.A0-V32T021.0	-	36	36	16.084	5.38	0.48	16.133	5.40	0.48	21.525	7.20	0.57	21.565	7.21	0.57
	127	V32T021.00-V32T019.0	-	36	36	16.084	0.44	0.58	16.133	0.44	0.58	21.525	0.59	0.77	21.565	0.59	0.78
Reach 8	128	V32T019.00-V32T018.0	-	36	36	16.083	0.84	0.70	16.132	0.84	0.70	21.510	1.12	0.98	21.554	1.12	0.99
	126	V32T018.00-V32T017.0	-	36	36	16.083	0.83	0.70	16.132	0.83	0.70	21.505	1.11	0.96	21.547	1.11	0.96
	125	V32T017.00-V32T016.0	-	36	36	16.082	0.85	0.69	16.131	0.85	0.69	21.502	1.13	0.93	21.543	1.13	0.93
	124	V32T016.00-V32T015.0	-	36	36	16.082	0.80	0.70	16.130	0.80	0.70	21.501	1.07	0.91	21.541	1.07	0.92
	123	V32T015.00-V32T014.0	-	36	36	16.081	0.86	0.70	16.130	0.86	0.70	21.501	1.15	0.89	21.541	1.15	0.89
	122	V32T014.00-V32T013.0	-	36	36	16.081	0.83	0.67	16.130	0.84	0.67	21.501	1.11	0.84	21.540	1.12	0.84
	120	V32T013.00-V32T012.0	-	36	36	16.081	0.84	0.59	16.130	0.84	0.59	21.501	1.12	0.72	21.540	1.13	0.72
	163	V32T012.00-V32T011.0	-	36	36	16.081	0.53	0.59	16.130	0.53	0.59	21.501	0.70	0.70	21.540	0.71	0.70
	829	V32T011.00-V32T010.0	-	36	36	16.081	12.02	0.60	16.130	12.06	0.60	21.501	16.07	0.70	21.540	16.10	0.70

Yellow Cells	Indicate criteria failure for either maximum q/Q (> 1.00) or d/D (>0.80). Only a combination of criteria failure for both q/Q and d/D would result in a recommended upgrade.
Red Cells	Indicate criteria failure for both maximum q/Q (> 1.00) and d/D (>0.80). System improvements should be considered for gravity mains failing both criteria.
Orange Cells	Indicate improvements related to CIP 8289 and CIP 8291

Appendix C
Existing System with CIP Upgrades
Peak Wet Weather Flow HGL Profiles

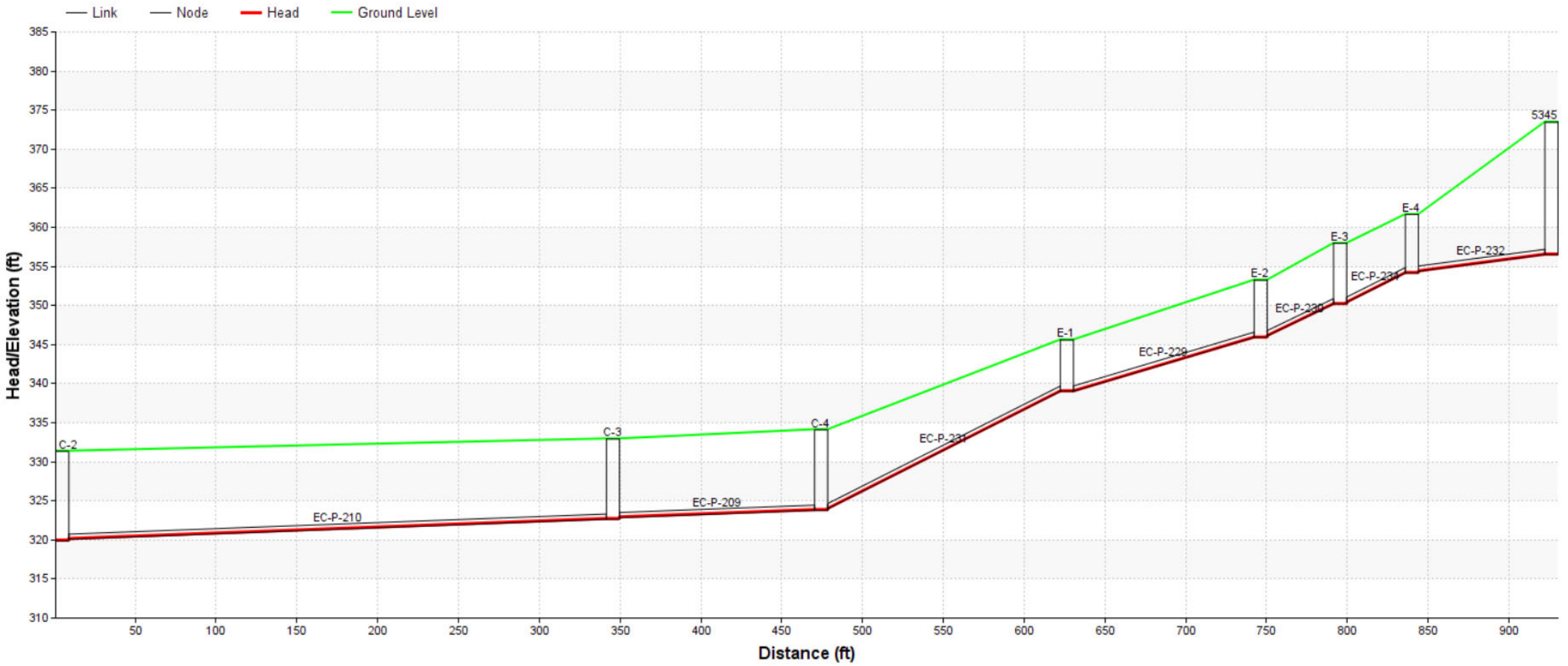
Sewer Line F – Existing PWWF

Sewer Line F – Existing PWWF



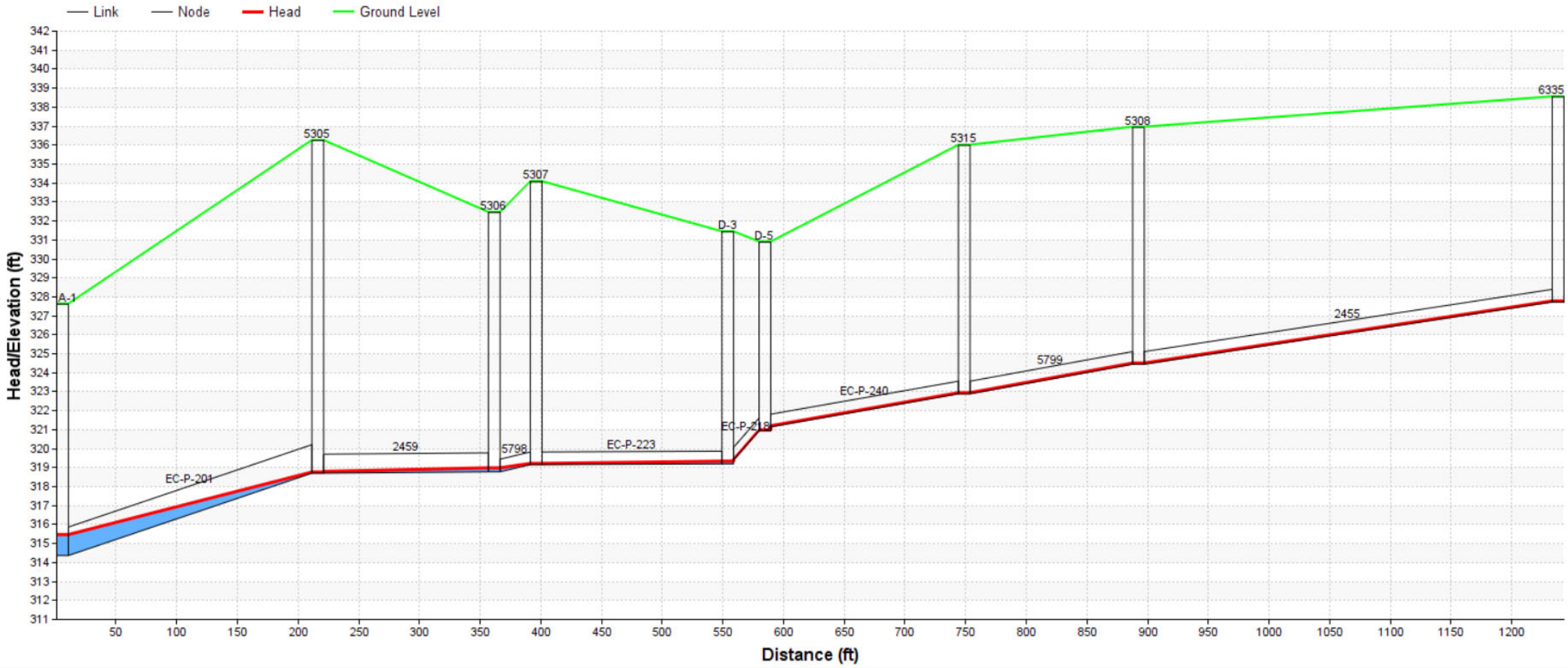
Sewer Line E – Existing PWWF

Sewer Line E – Existing PWWF



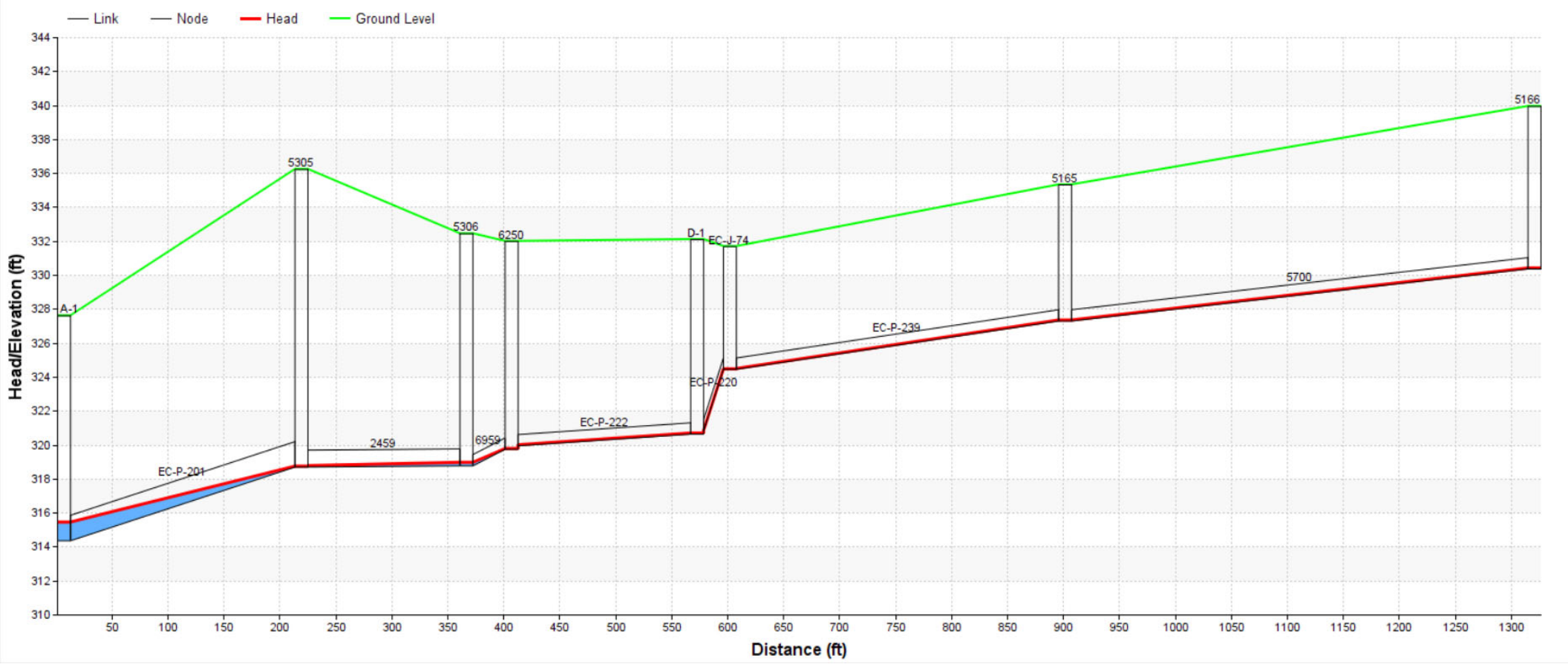
Sewer Line D 3 – Existing PWWF

Sewer Line D 3 – Existing PWWF



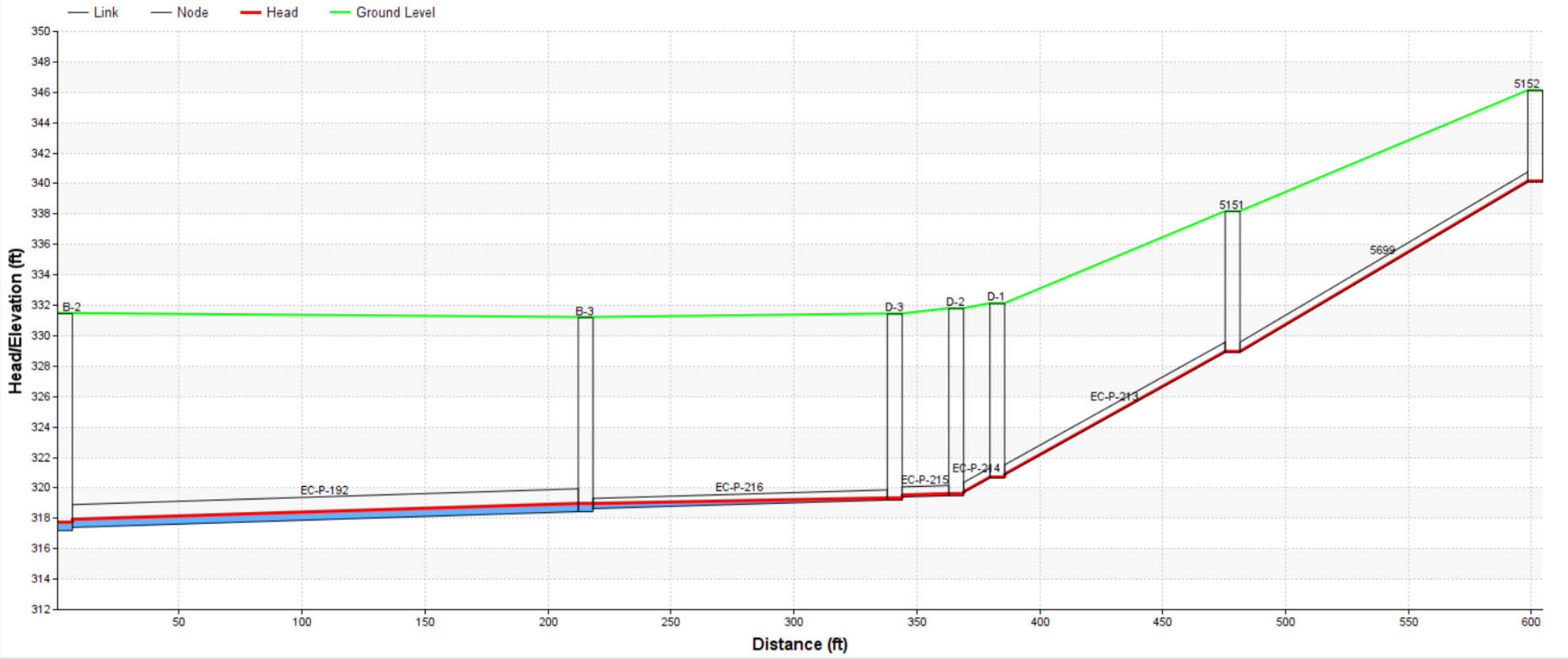
Sewer Line D 2 – Existing PWWF

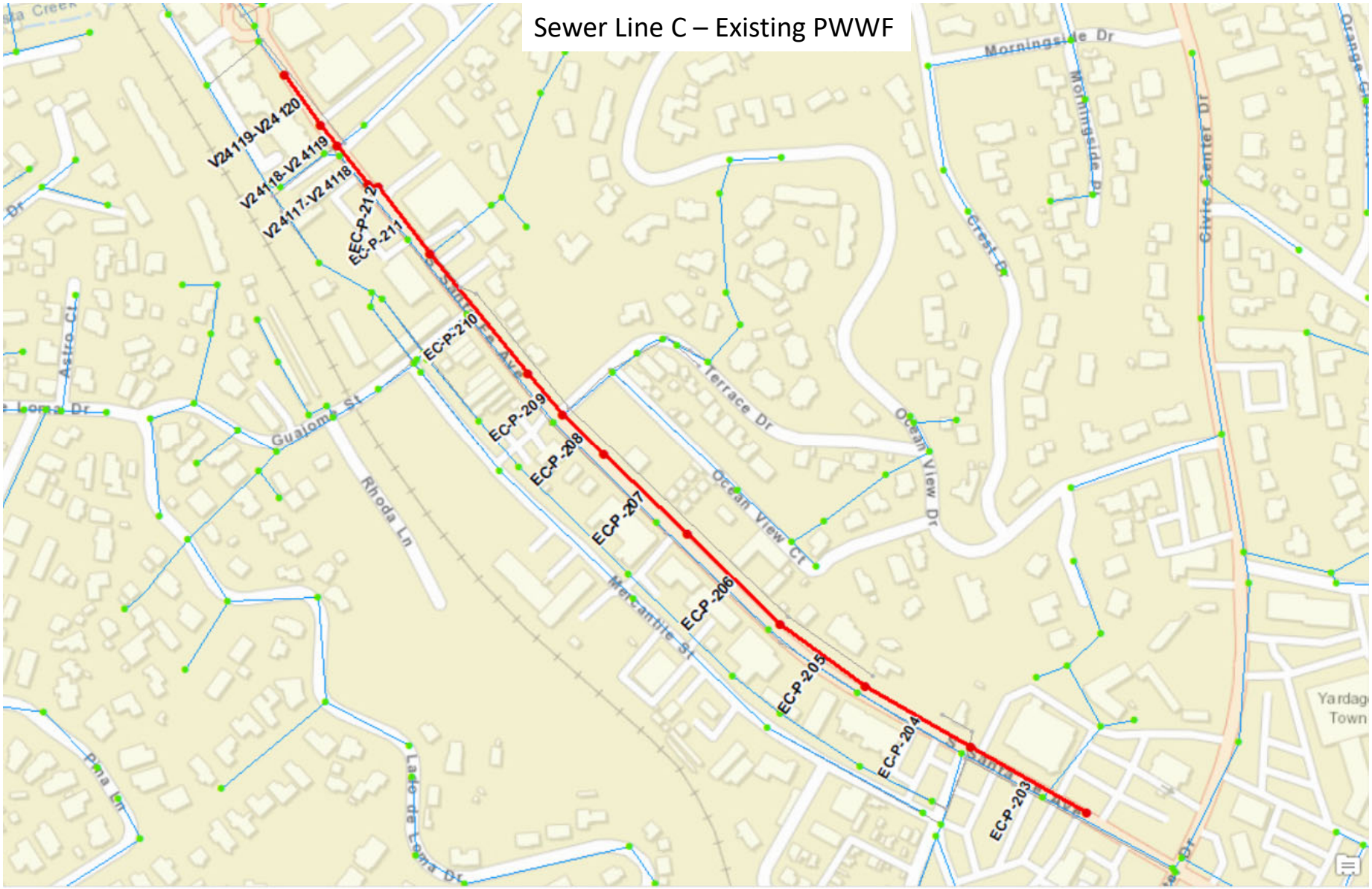
Sewer Line D 2 – Existing PWWF



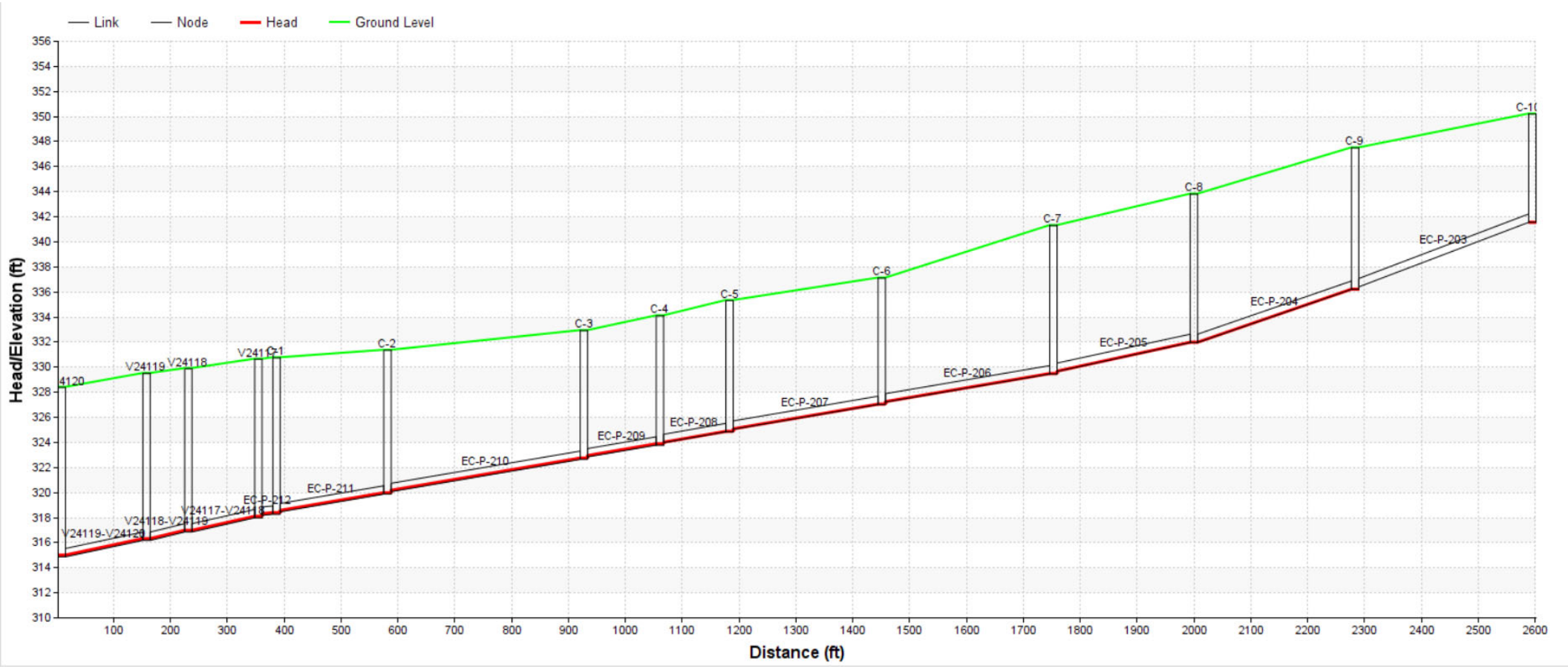
Sewer Line D – Existing PWWF

Sewer Line D – Existing PWWF

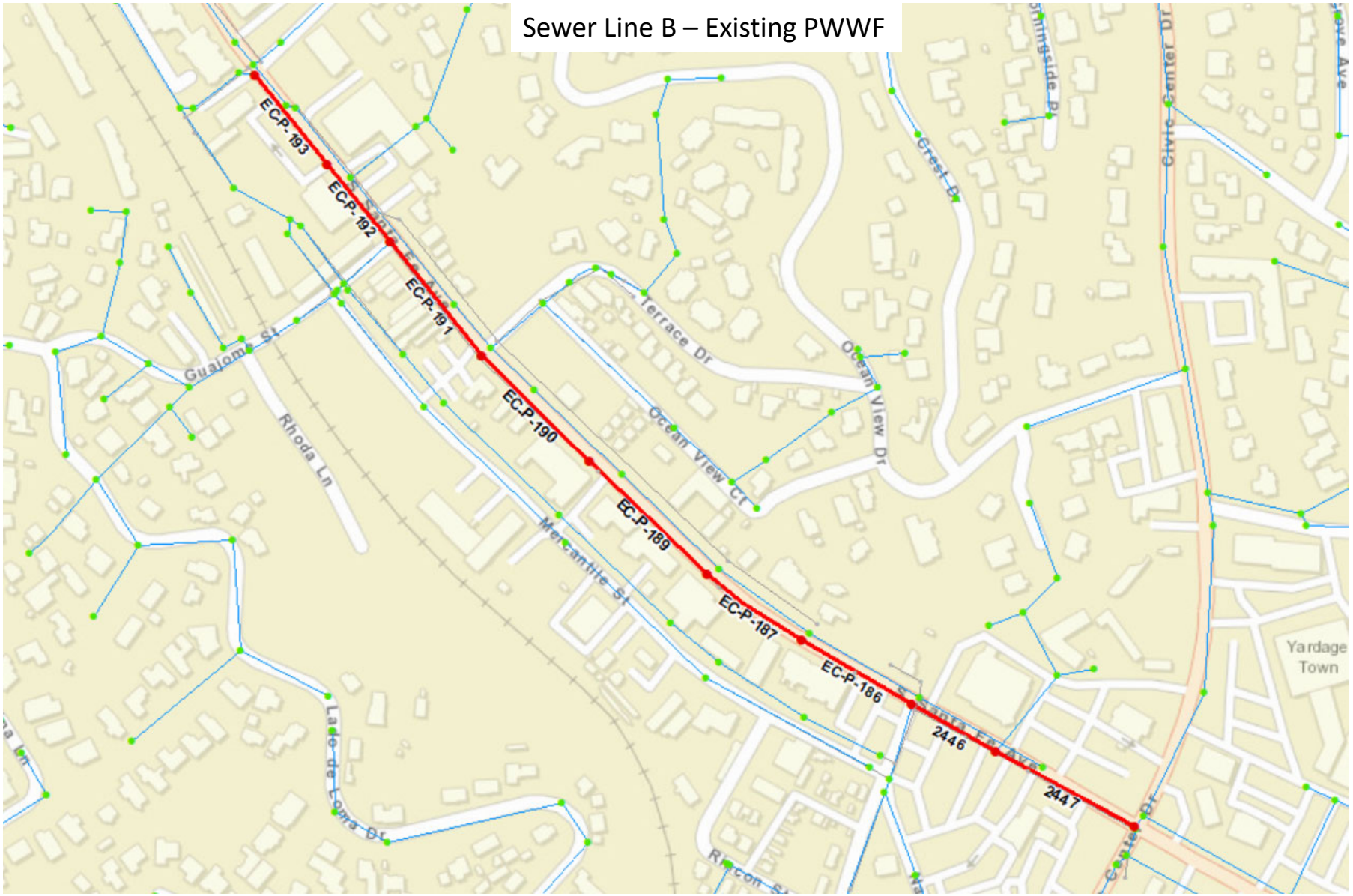



Sewer Line C – Existing PWWF
V24119-V24120
V24118-V24119
V24117-V24118
EC-P-212
EC-P-211
EC-P-210
EC-P-209
EC-P-208
EC-P-207
EC-P-206
EC-P-205
EC-P-204
EC-P-203
Morningside Dr
Crest Dr
Civic Center Dr
Terrace Dr
Ocean View Dr
Ocean View Ct
Gualom St
Rhoda Ln
Mercantile St
Astro Ct
Pina Ln
Laderia Loma Dr
Yardag
Town

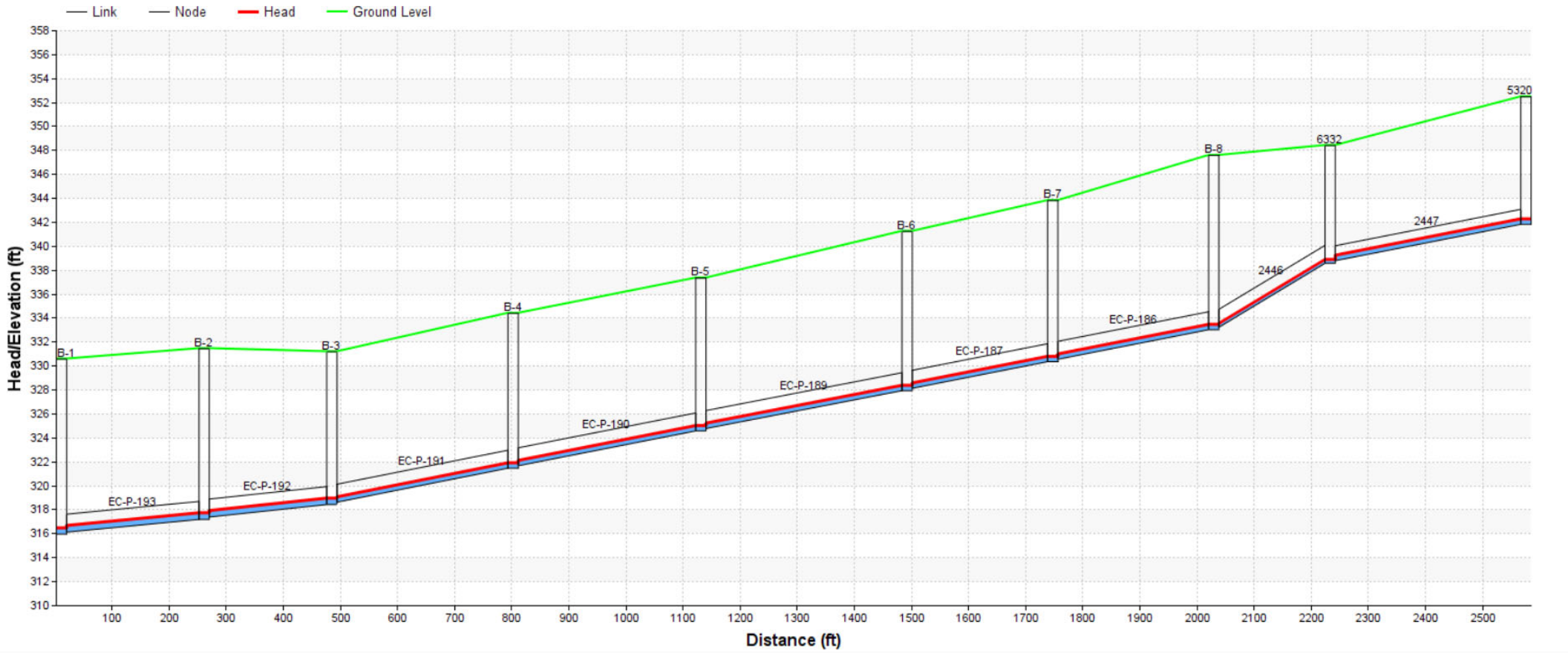
Sewer Line C – Existing PWWF



Sewer Line B – Existing PWWF

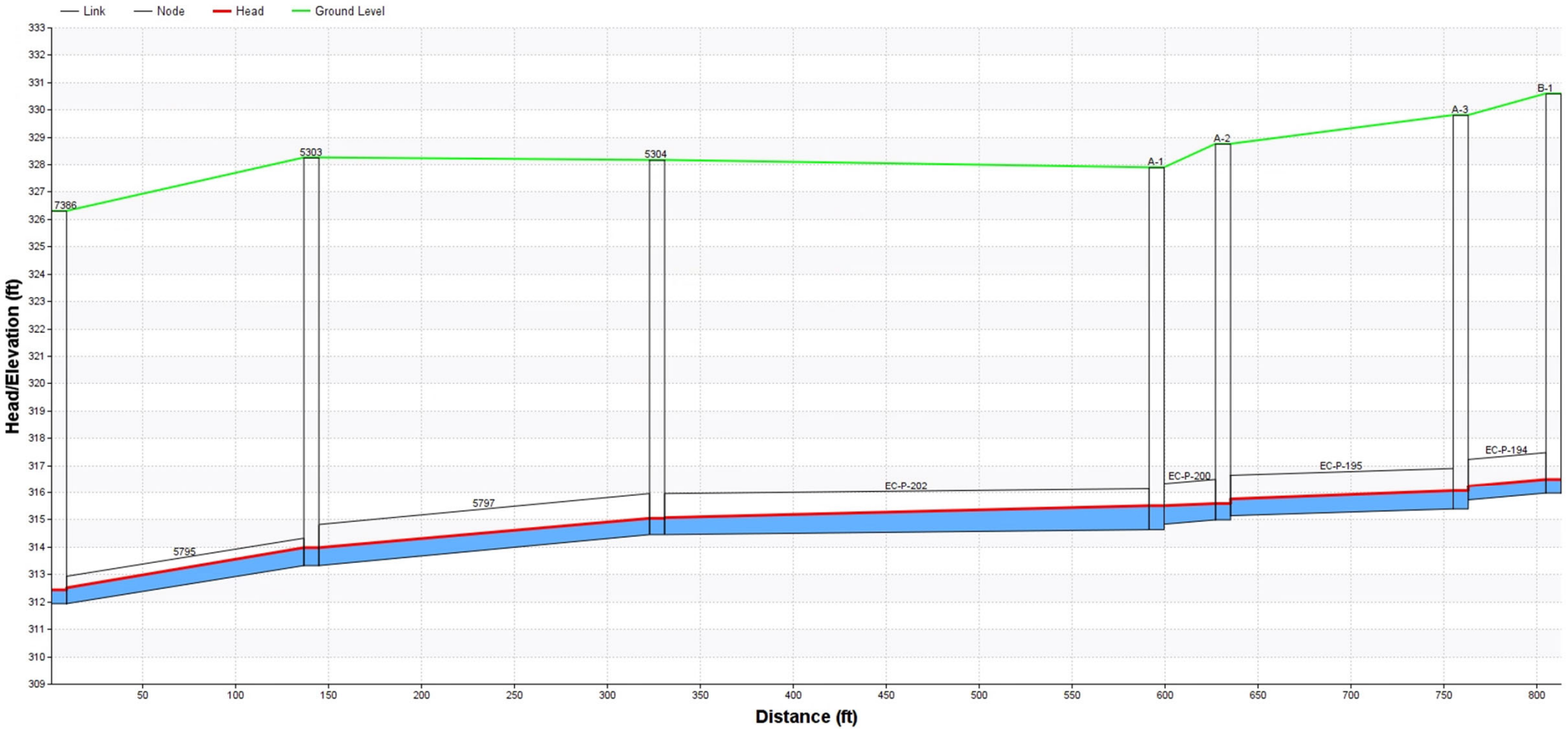


Sewer Line B – Existing PWWF



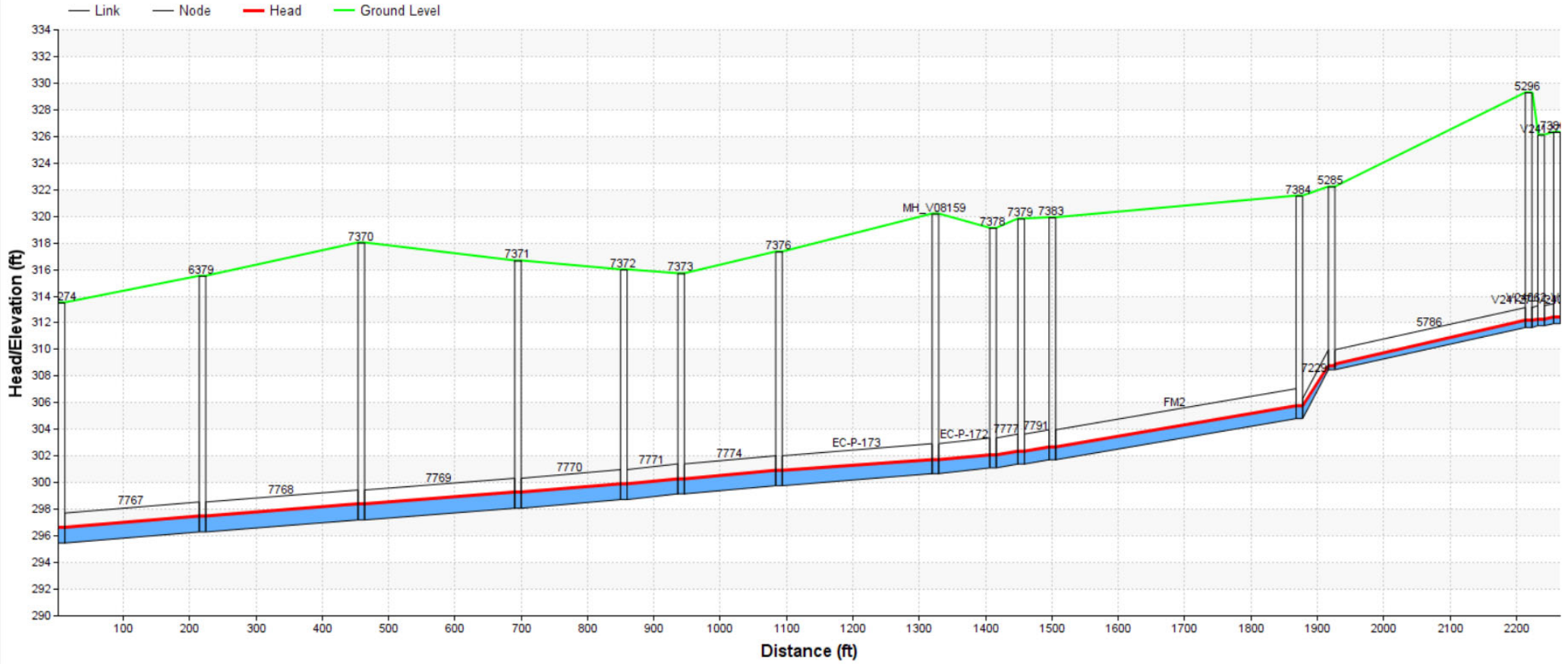
Sewer Line A – Existing PWWF

Sewer Line A – Existing PWWF



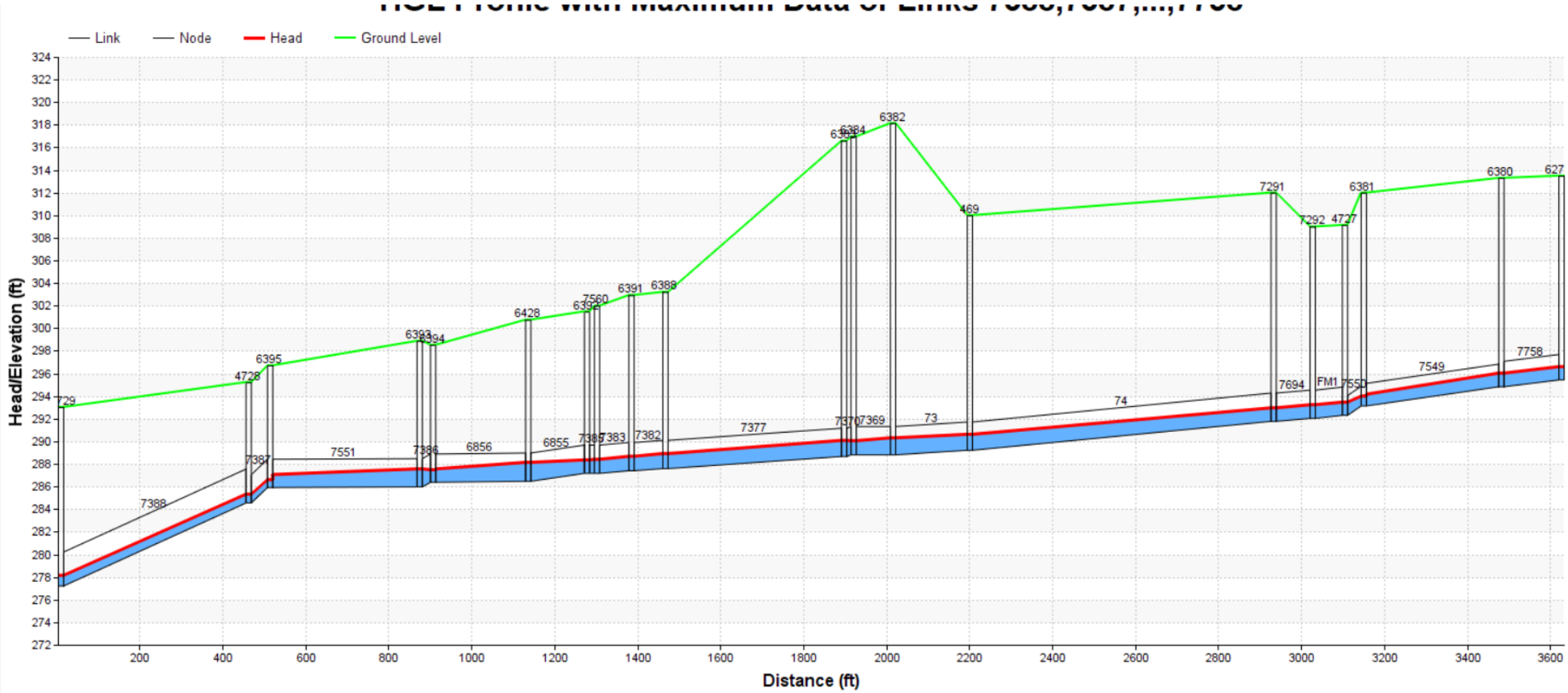

Reach 1 – Existing PWWF
Vista Village Dr
BURGER KING
Fruttos Yogurt
AT&T
Wave Waterpark
Wave Waterpark
Buena Vista Creek
Buena Vista Creek
Wave Dr
Eddie Dr
Peters Dr
Lado de Loma Dr
Lado de Loma Dr
Santa Fe Ave
Veterans Memorial Park
Sprinter
7767
7768
7769
7770
7771
7774
EC-P-173
EC-P-172
7791
FM2
7229
5786

Reach 1 – Existing PWWF



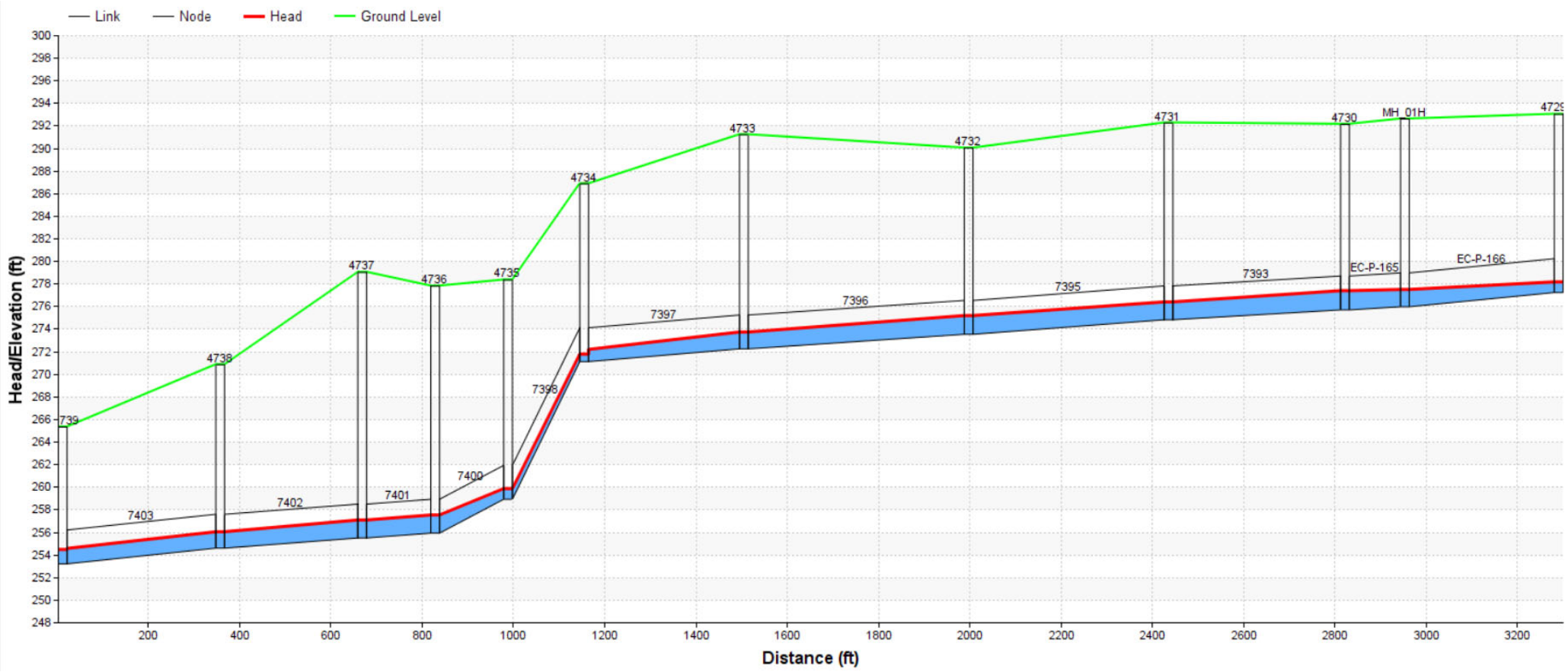
Reach 2 – Existing PWWF

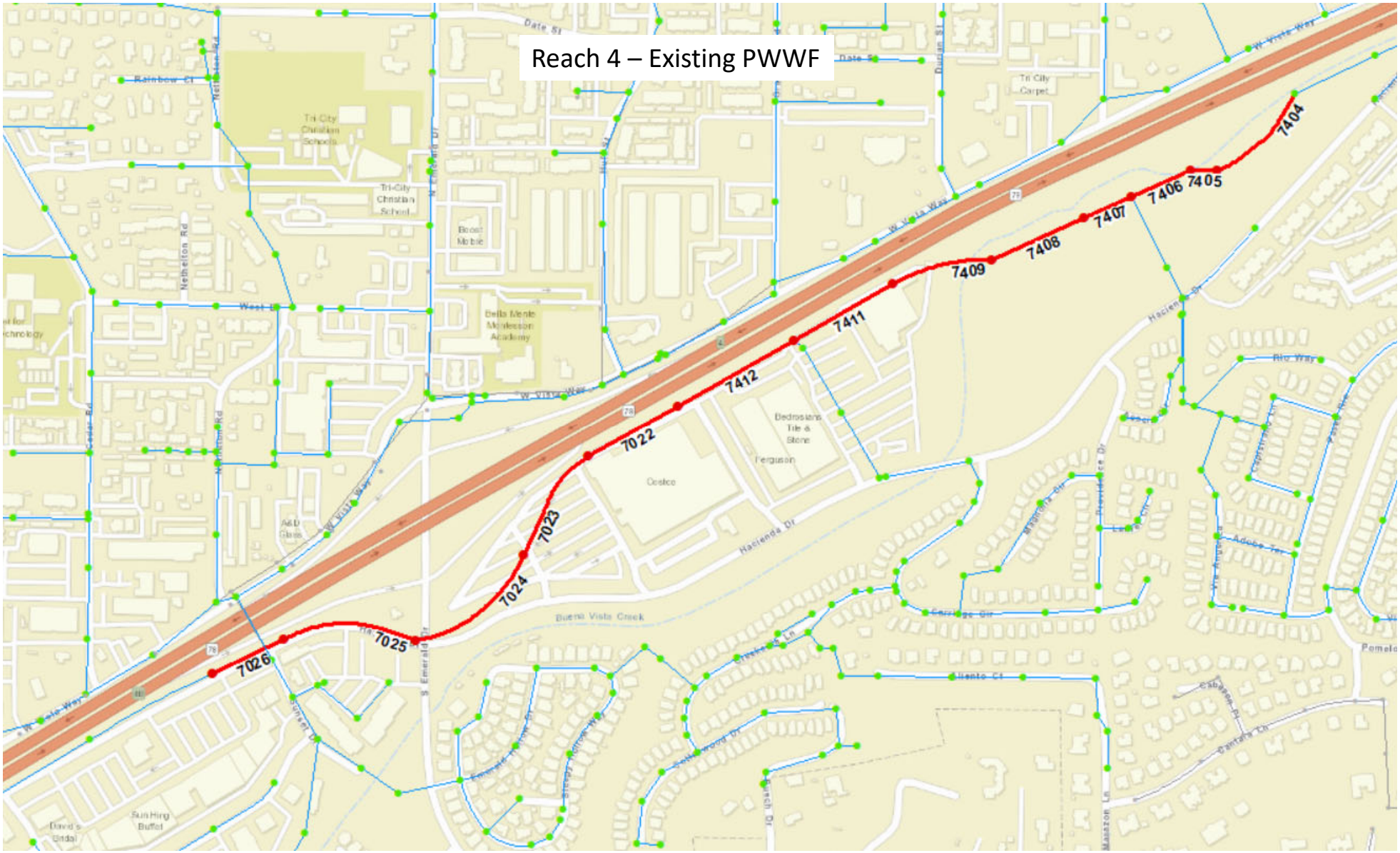
Reach 2 – Existing PWWF



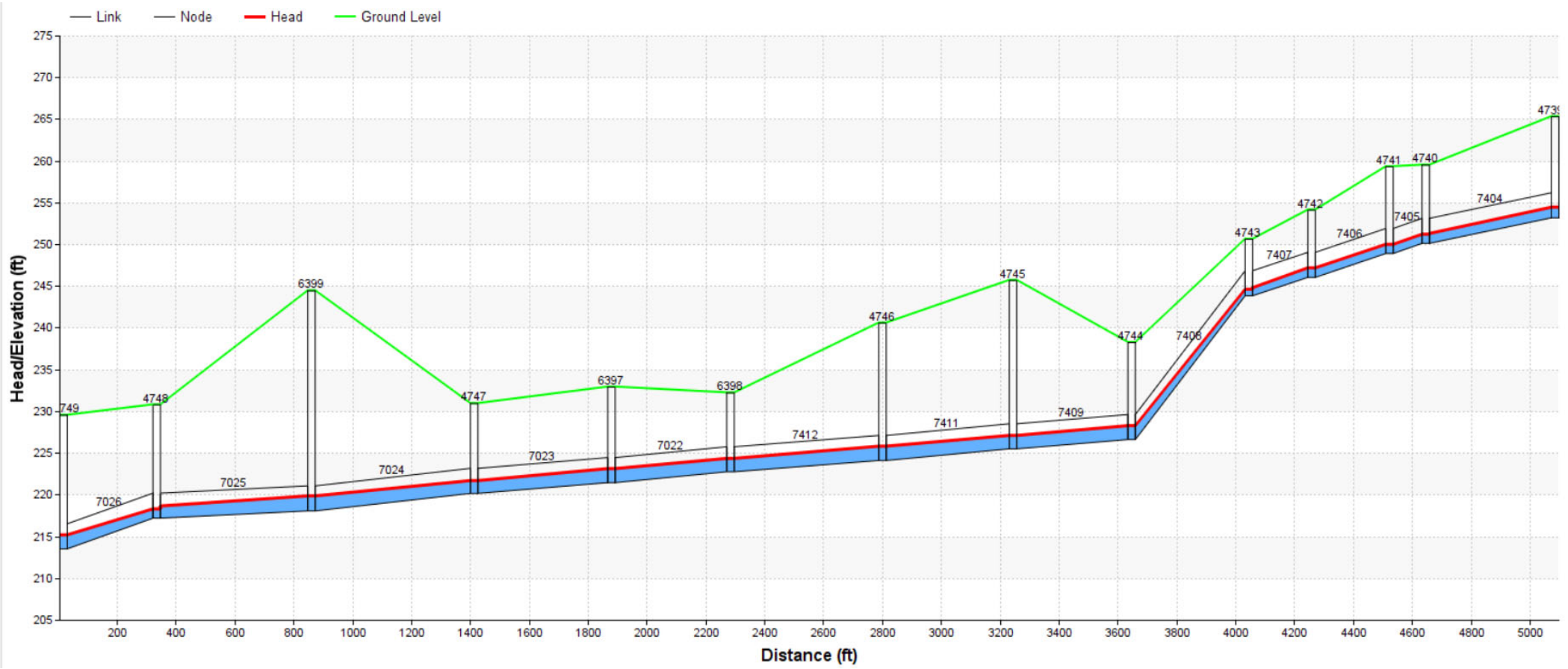

Reach 3 – Existing PWWF
W Vista Way
Hackamore Rd
Santa Clara Dr
Celosa Way
Copper Ave
Bass Ln
Bronze Way
Vista Inn
Santa Barbara Way
78
6A
7403
7402
7401
7400
7398
7397
7396
7395
7393
EC-P-165
EC-P-166
Hacienda Dr
Ira Way
Soft Wind Rd
Wandering Rd
Breeze Hill Rd
Margo Pl
Pomelo Dr
Jobe Hill Dr
La Tortuga Dr

Reach 3 – Existing PWWF

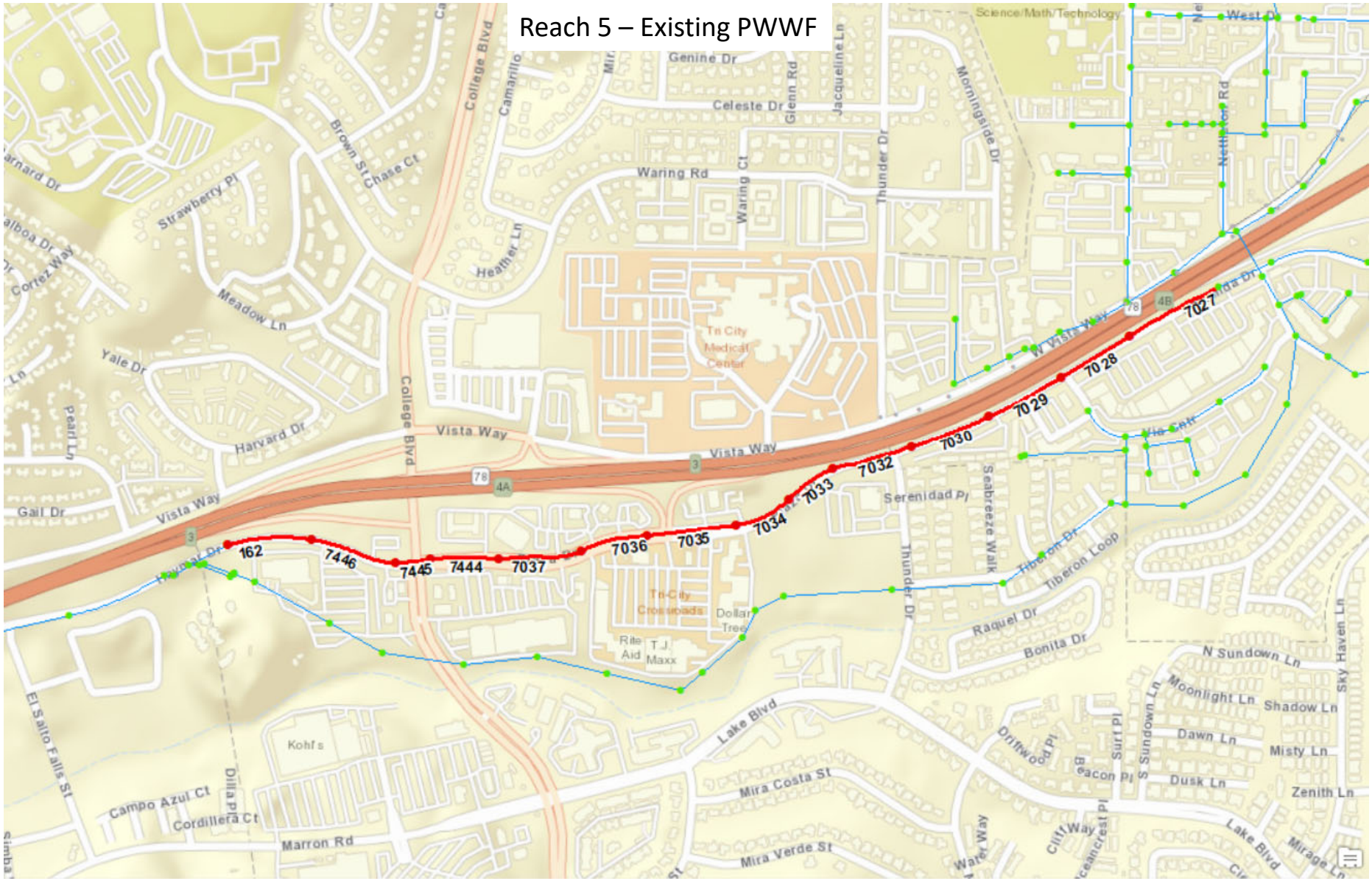



Reach 4 – Existing PWWF
7026
7025
7024
7023
7022
7412
7411
7409
7408
7407
7406
7405
7404
Costco
Bedrosians Tile & Stone
Ferguson
Bella Mente Montessori Academy
Tri-City Christian Schools
Buena Vista Creek
Hacienda Dr
W Vista Way
Date St
Rainbow Ct
Nettleton Rd
West Ln
S Emerald Dr
Sunset Dr
Rio Way
Sunset Ln
Sun Hing Buffet

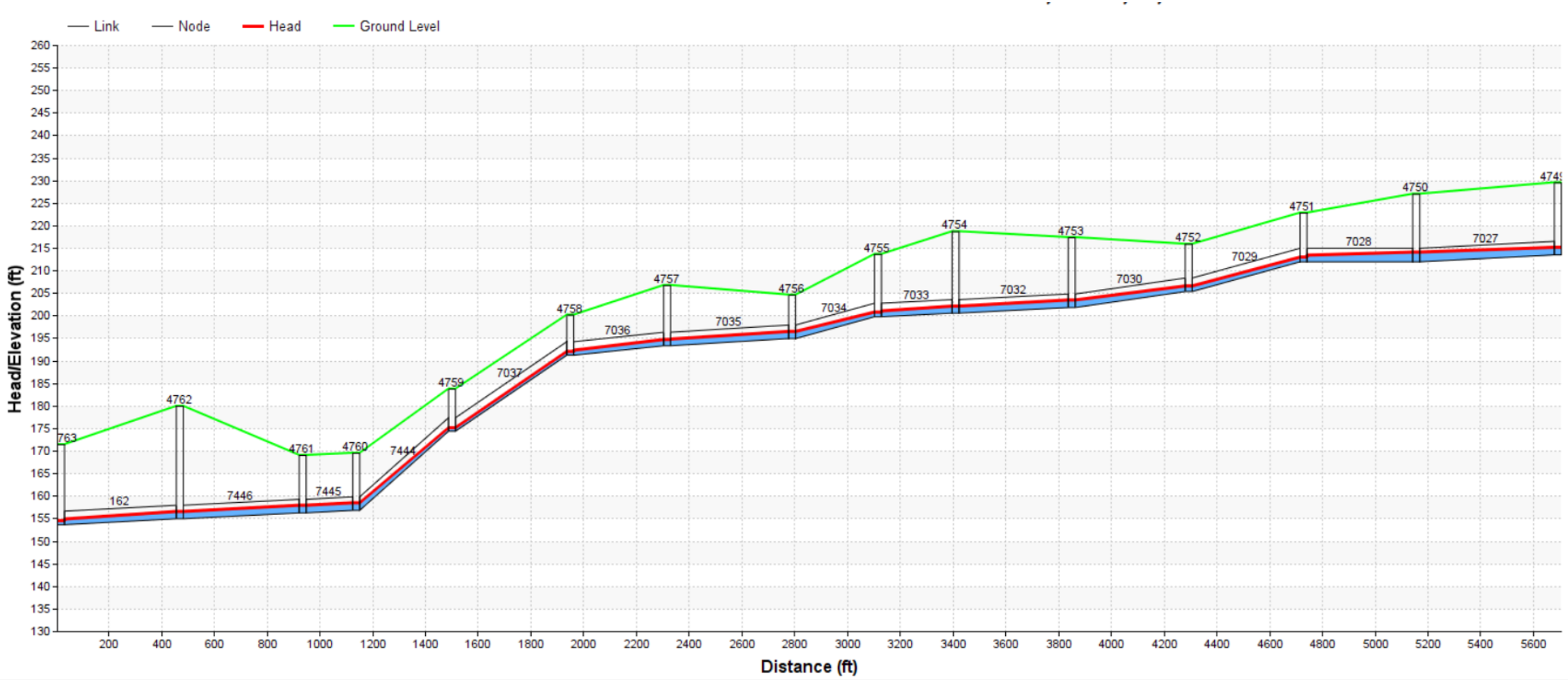
Reach 4 – Existing PWWF



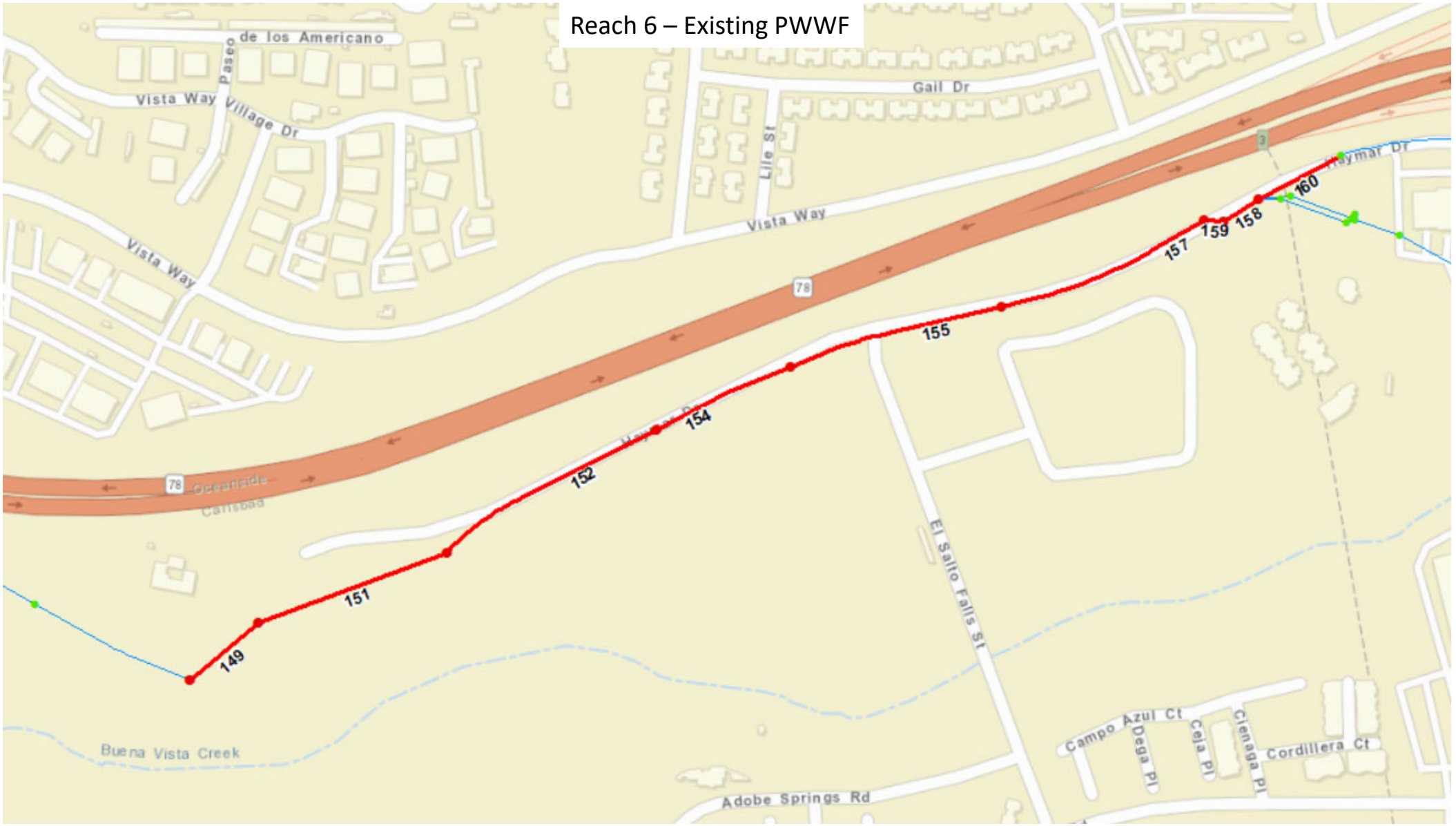
Reach 5 – Existing PWWF



Reach 5 – Existing PWWF

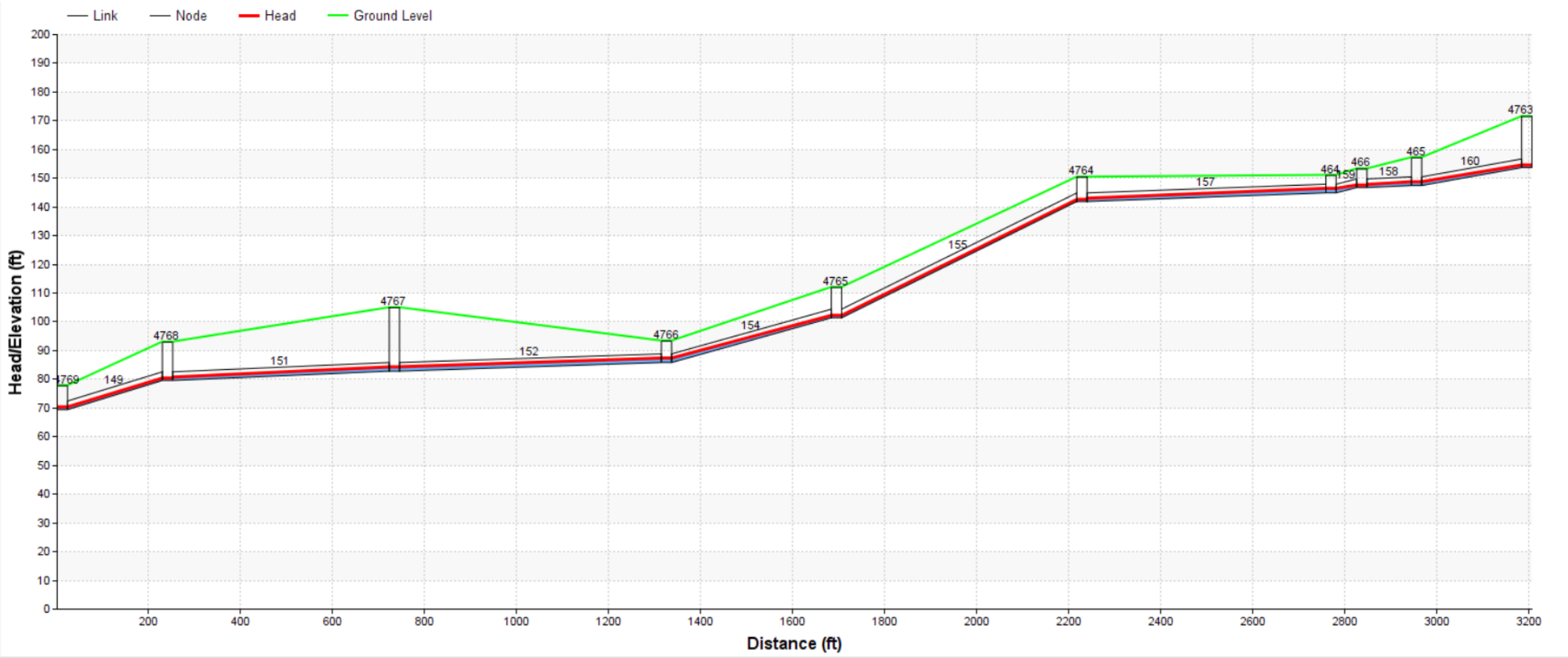


Reach 6 – Existing PWWF

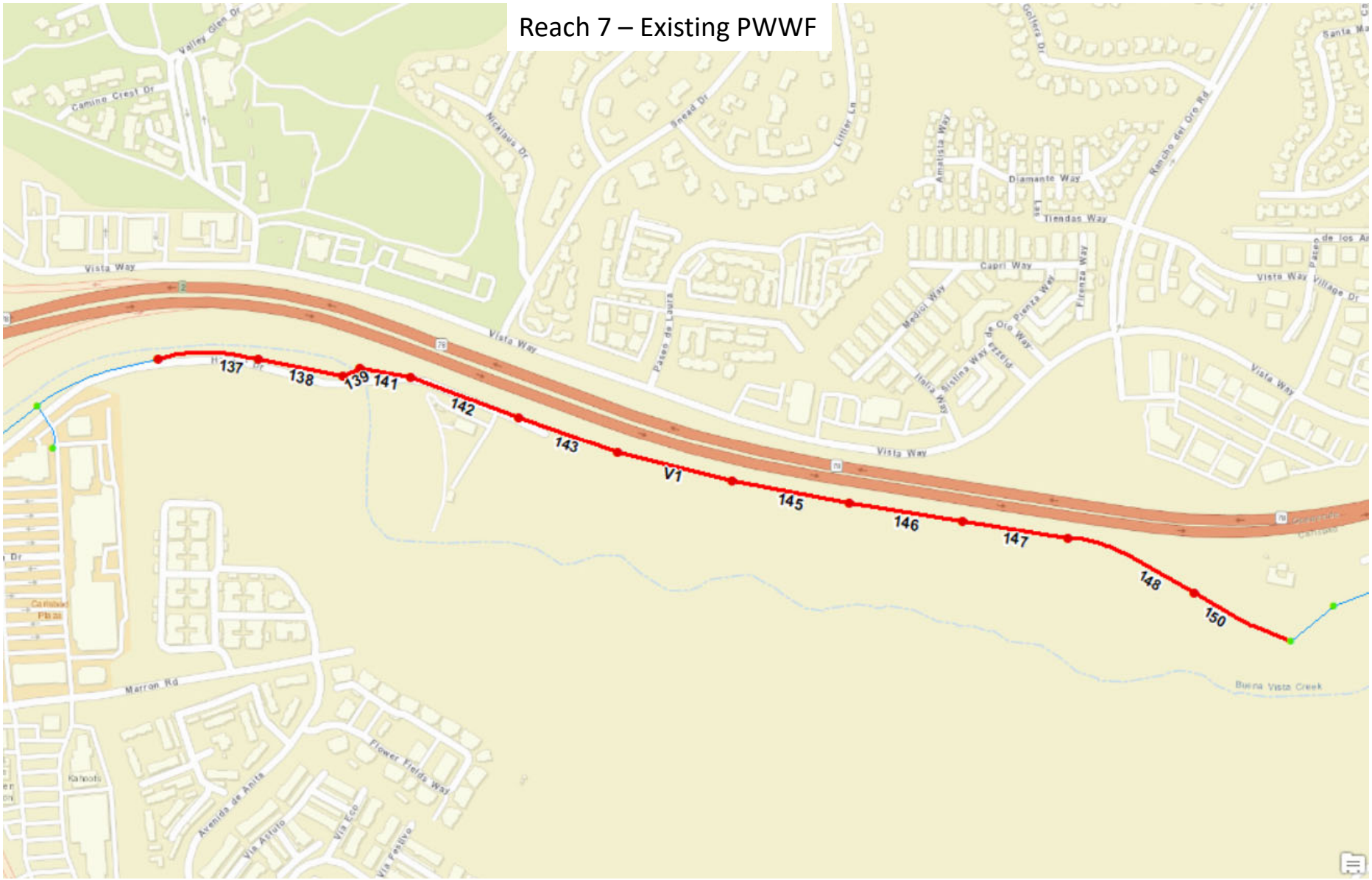


UKS0

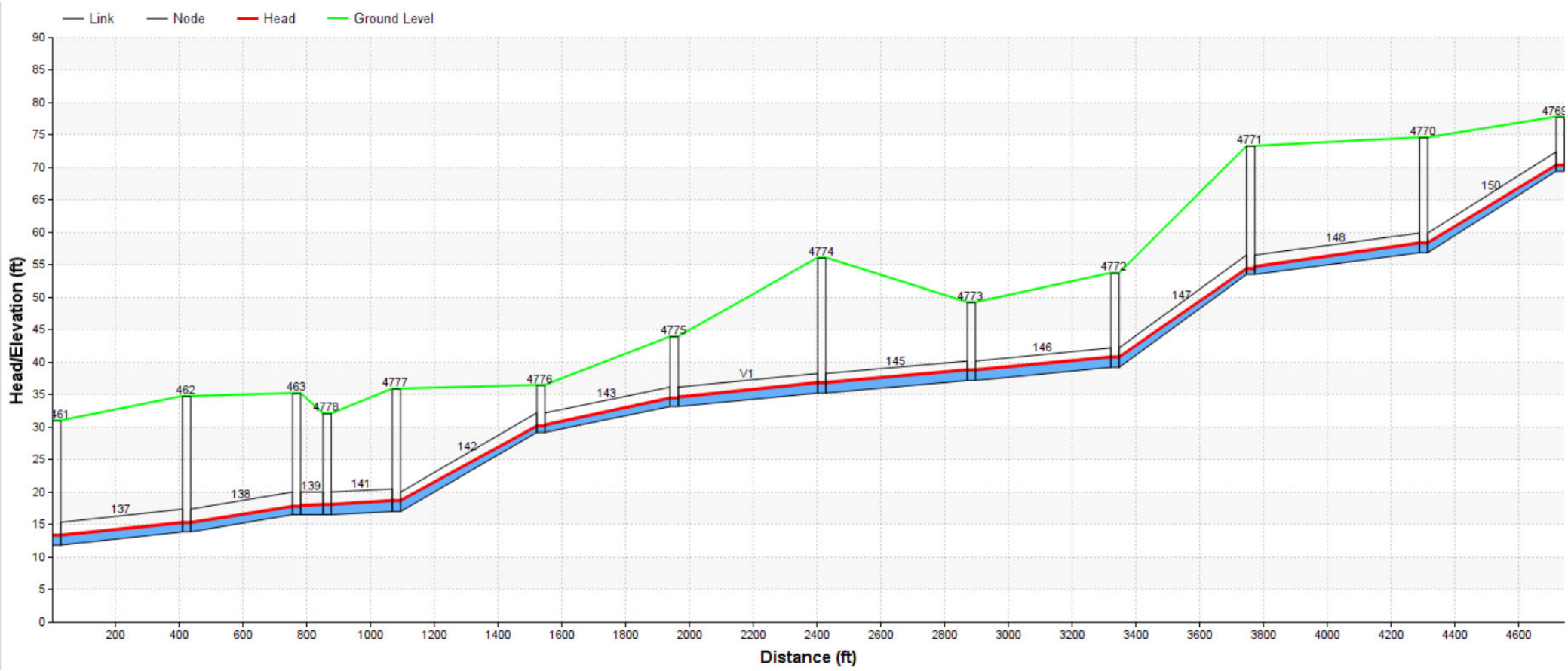
Reach 6 – Existing PWWF



Reach 7 – Existing PWWF

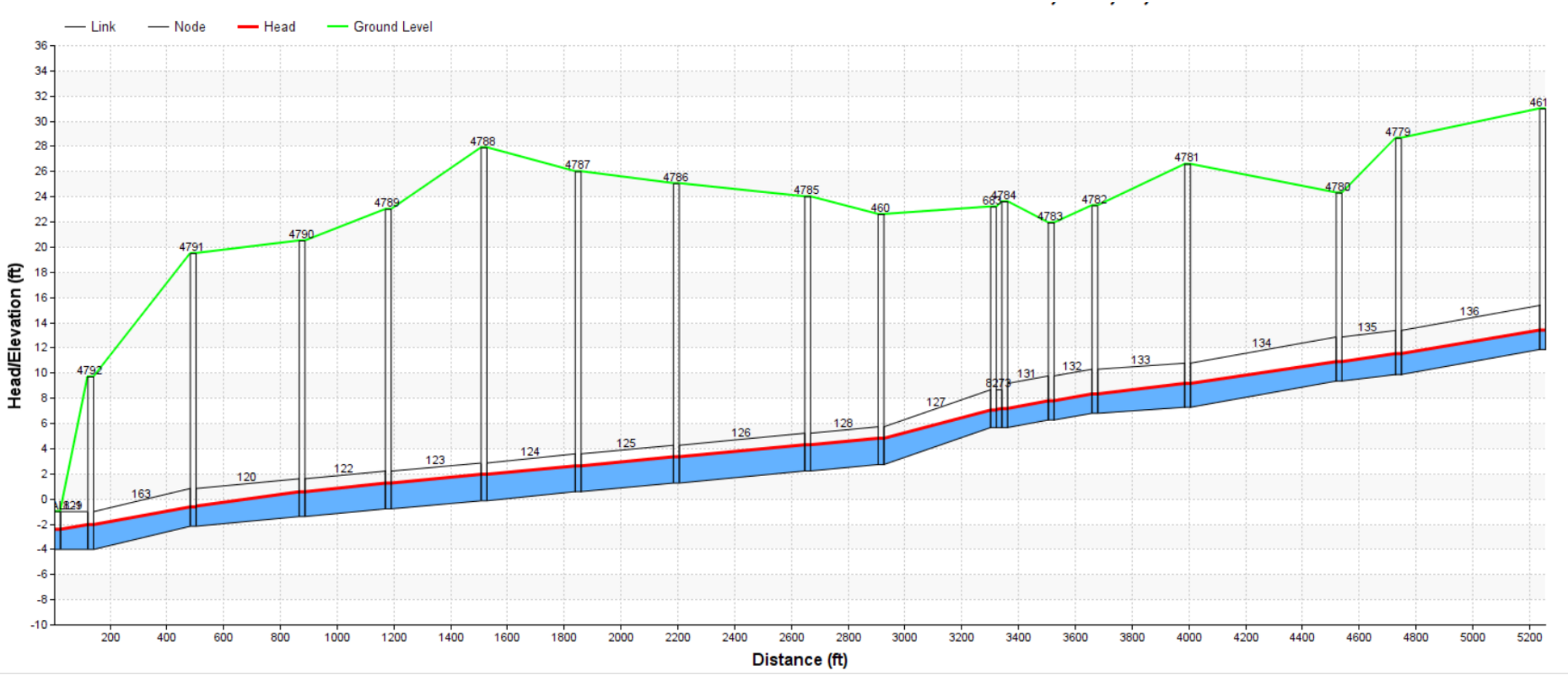


Reach 7 – Existing PWWF




Reach 8 – Existing PWWF
829
163
120
122
123
124
125
126
128
127
131
132
133
134
135
136
Ivy Rd
Vista Way
Olson Way
Sears
El Camino North
Ulta
Union Bank
El Torito
Town and Country
Camino Crest Dr
78
1C
2
S Vista Way
Oceanside
Carlsbad
Buena Vista Creek
Monroe St
El Camino Real
Carlsbad Plaza
Dollar Tree
Westfield Plaza Camino Real
North County Plaza
Audeo Charter II
Plaza Dr
Marron Rd
Jefferson St
Hosp Grove Park
Ratcliff Rd
Guevara Rd
Avenida Magnifica
Hosp Way
Wintergreen Dr
Grove Ave

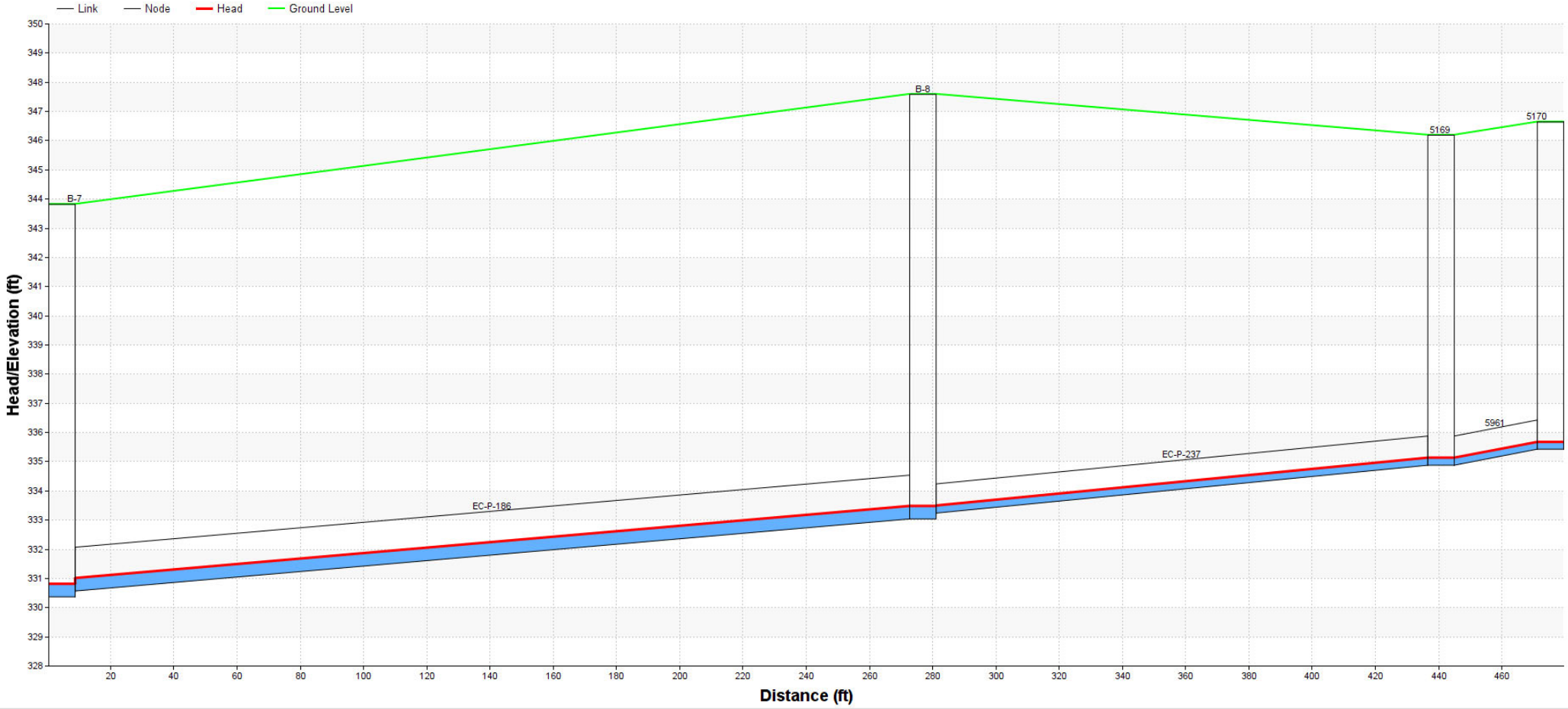
Reach 8 – Existing PWWF



Appendix D
Existing System with CIP Upgrades
+Development Flows
Peak Wet Weather Flow HGL Profiles

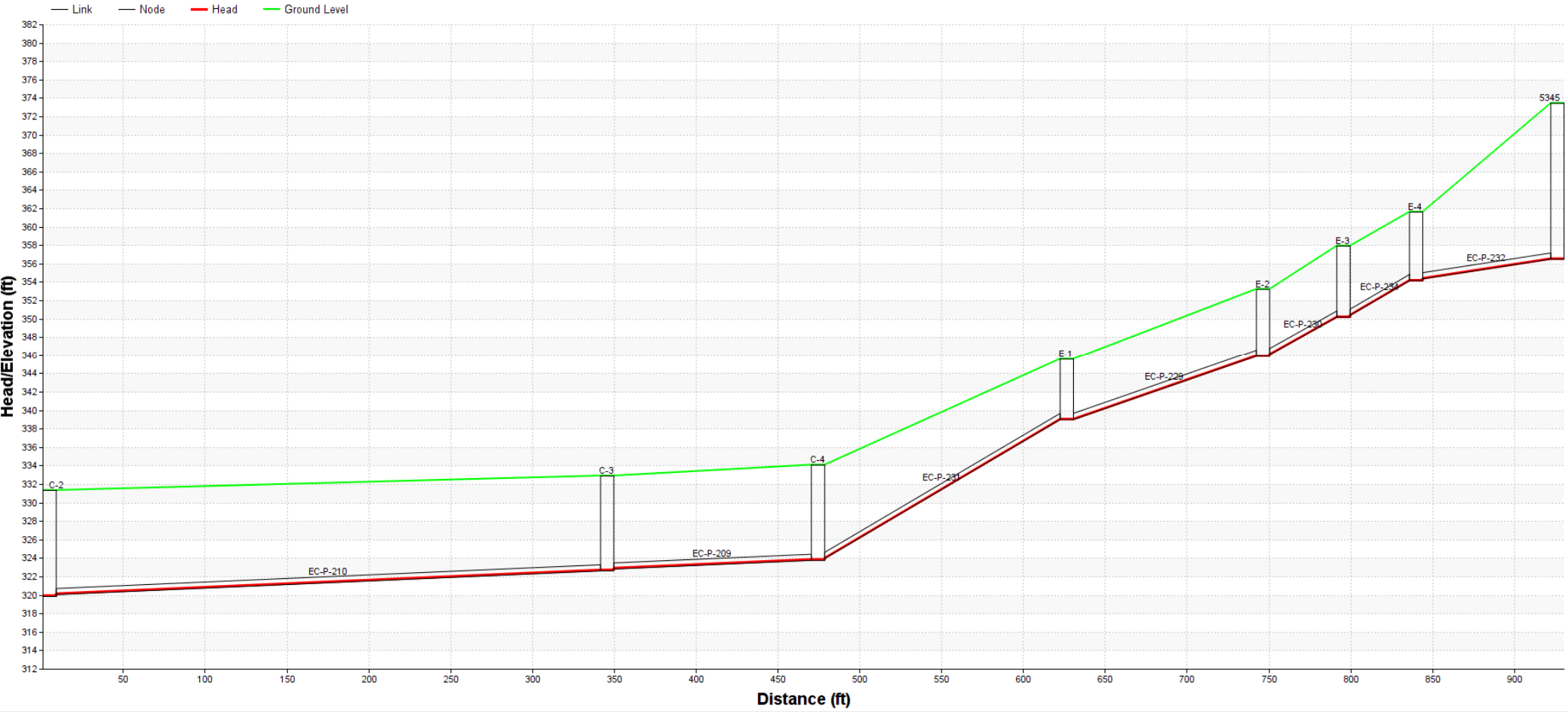
Sewer Line F – Existing PWWF

Sewer Line F – Existing PWWF



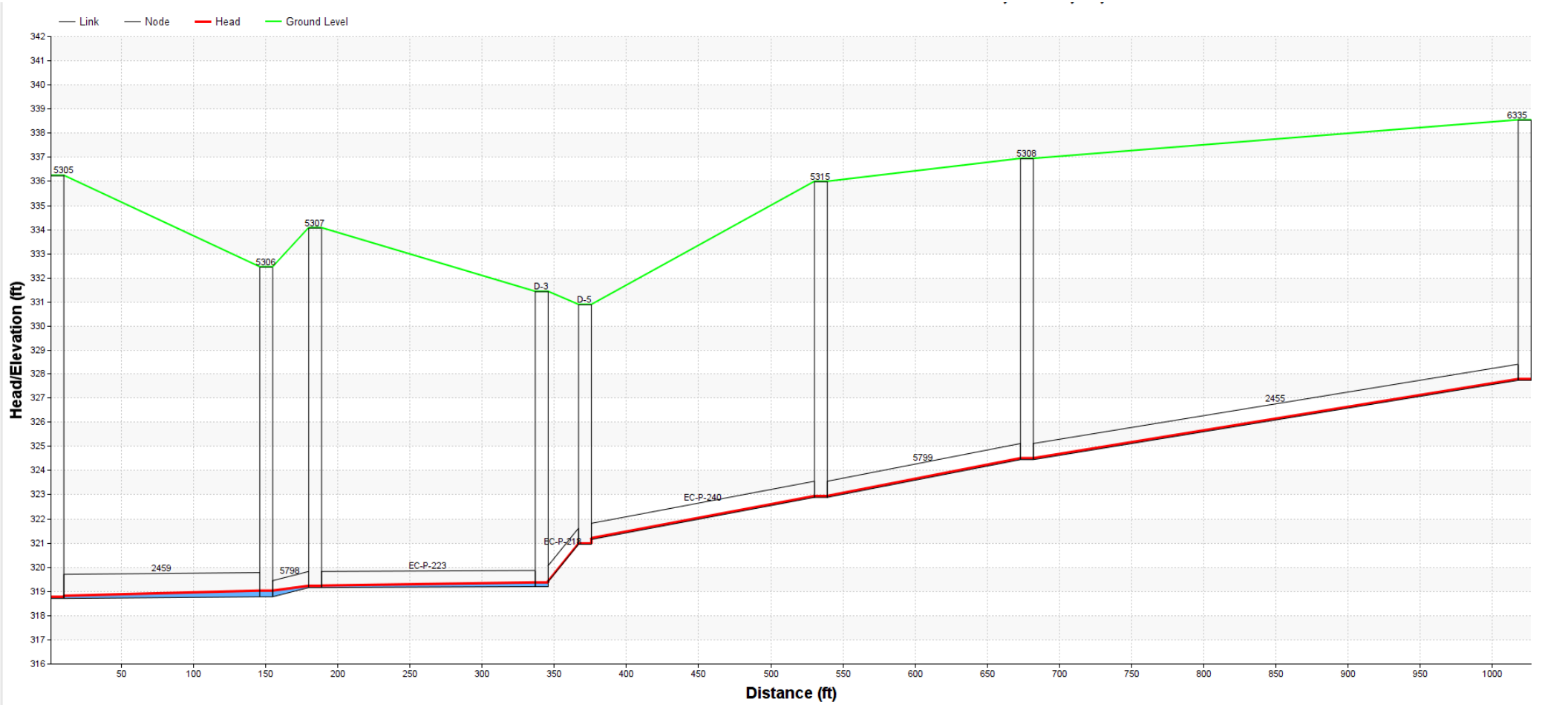
Sewer Line E – Existing PWWF

Sewer Line E – Existing PWWF



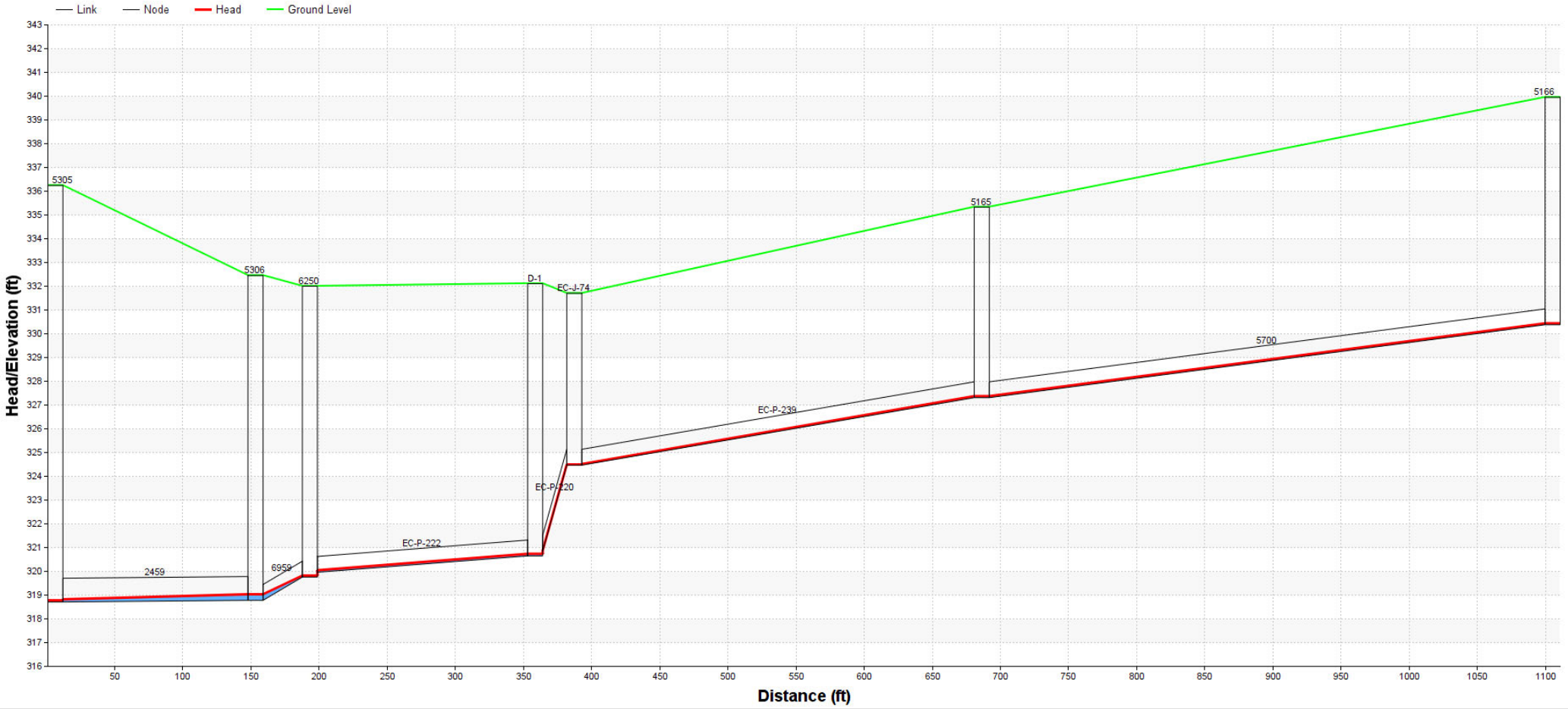
Sewer Line D 3 – Existing PWWF

Sewer Line D 3 – Existing PWWF



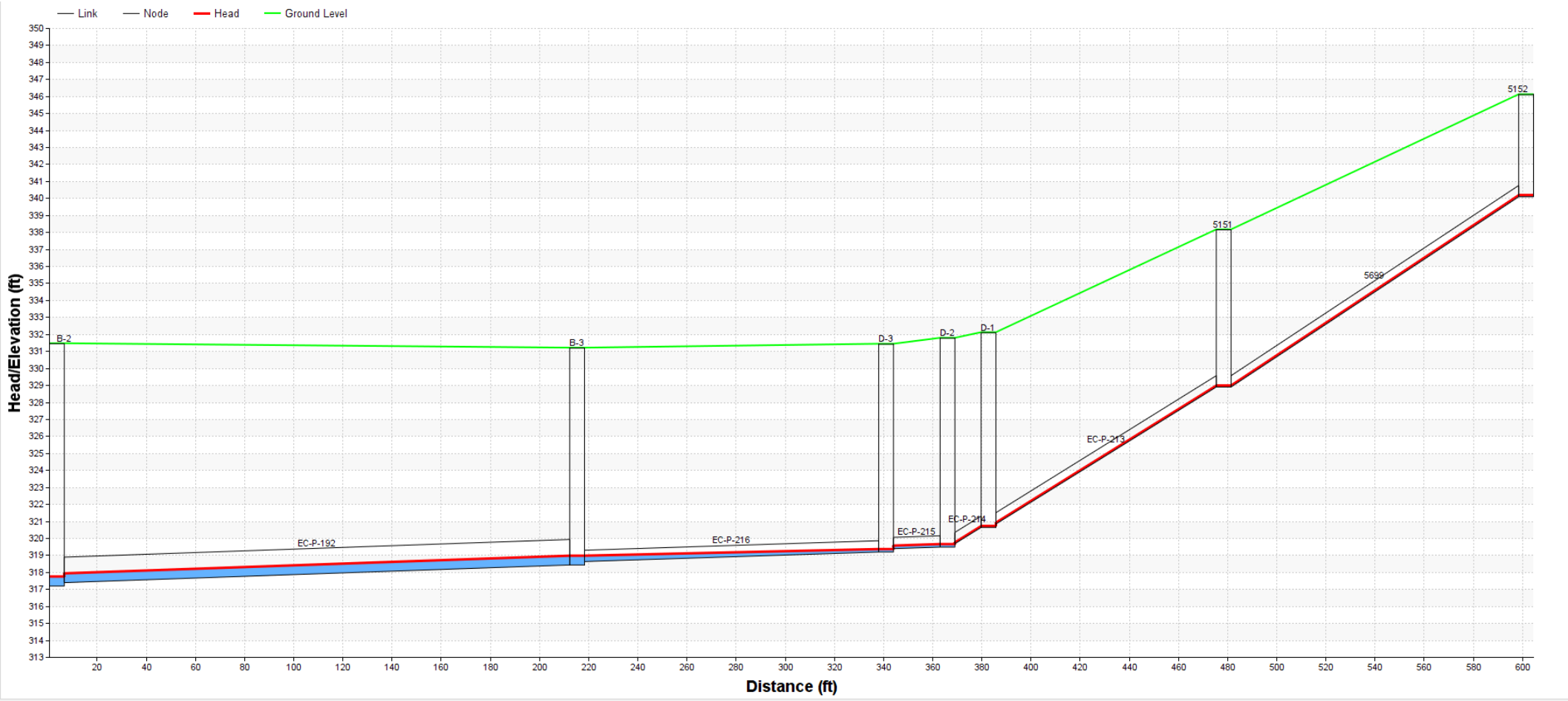
Sewer Line D 2 – Existing PWWF

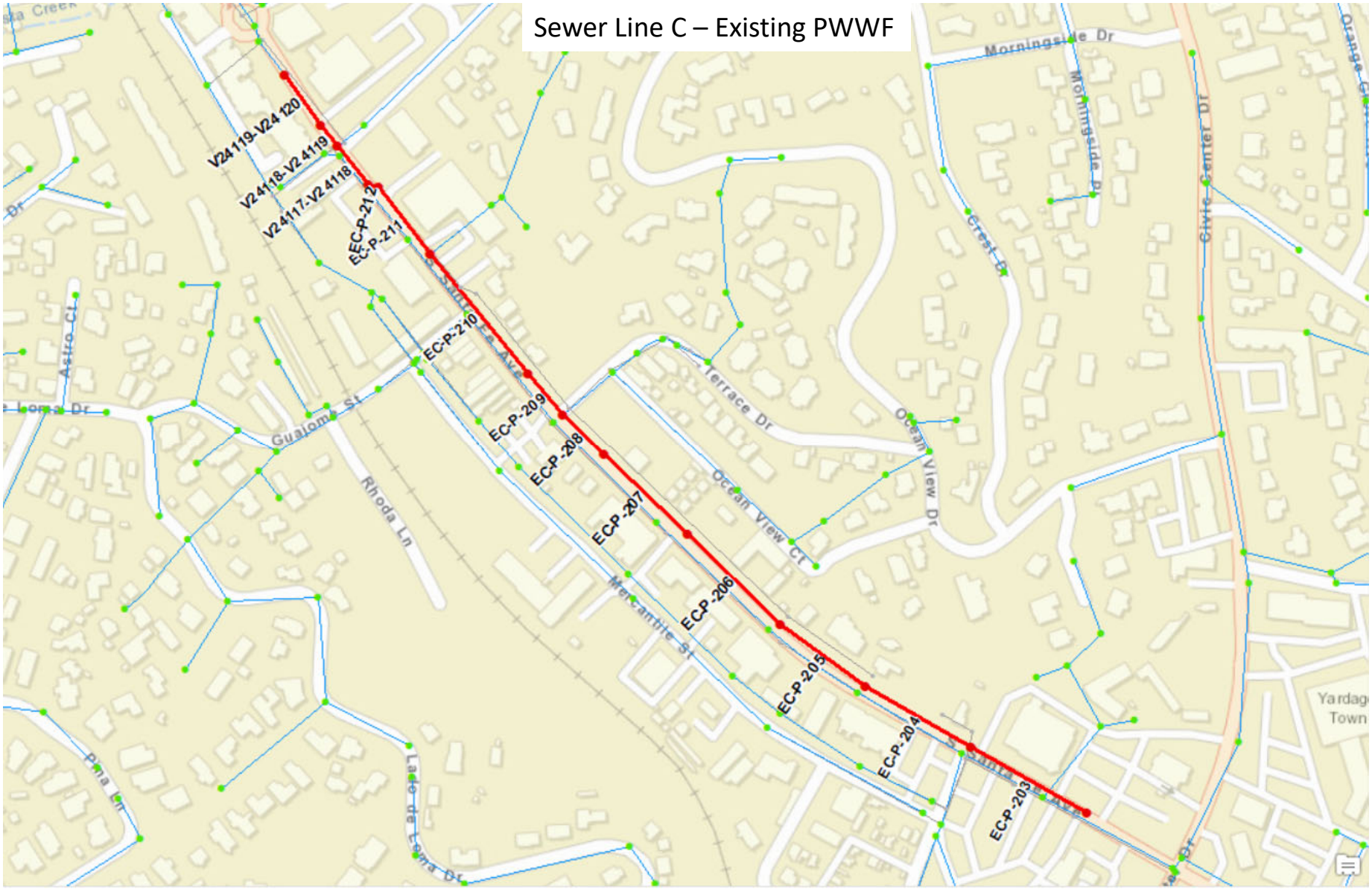
Sewer Line D 2 – Existing PWWF



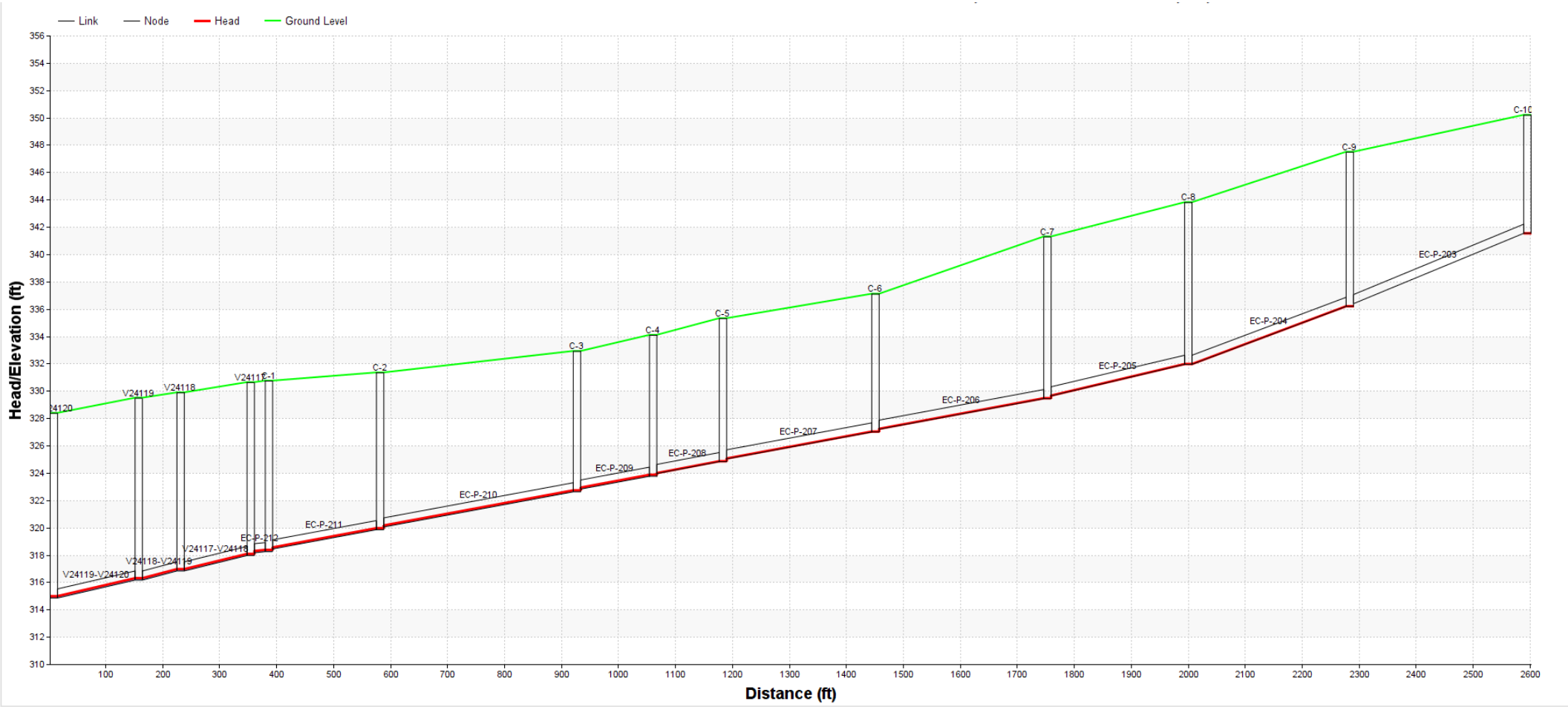

Sewer Line D – Existing PWWF
EC-P-192
S Santa Fe Ave
EC-P-216
EC-P-215
EC-P-213
5699
Guajome St
Sprinter
Terrace Dr
Junction with Kenosha Development Flow Loading

Sewer Line D – Existing PWWF

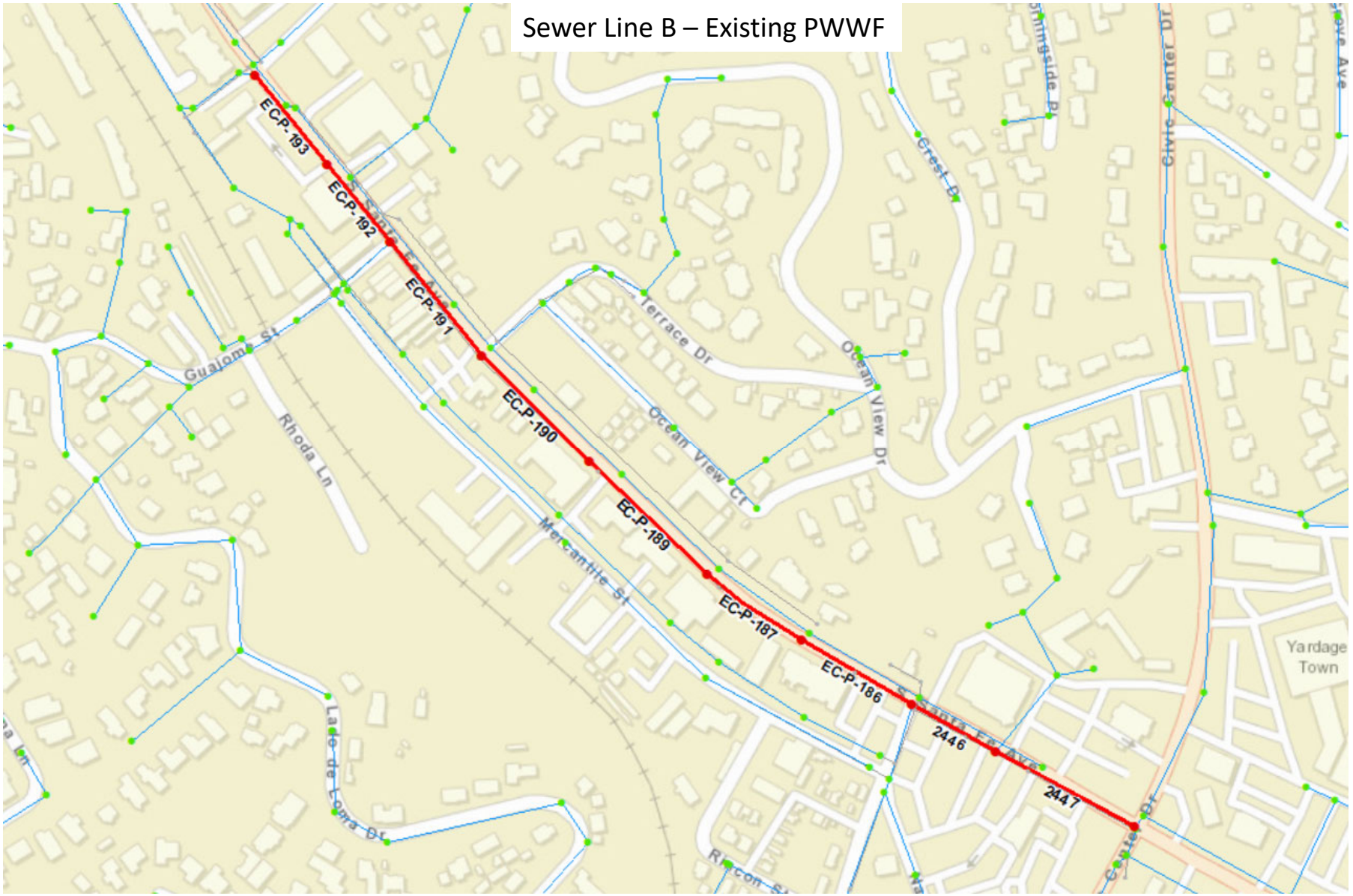



Sewer Line C – Existing PWWF
V24119-V24120
V24118-V24119
V24117-V24118
EC-P-212
EC-P-211
EC-P-210
EC-P-209
EC-P-208
EC-P-207
EC-P-206
EC-P-205
EC-P-204
EC-P-203
Morningside Dr
Crest Dr
Civic Center Dr
Terrace Dr
Ocean View Dr
Ocean View Ct
Gualom St
Rhoda Ln
Mercantile St
Astro Ct
Pina Ln
Laderia Loma Dr
Yardag
Town

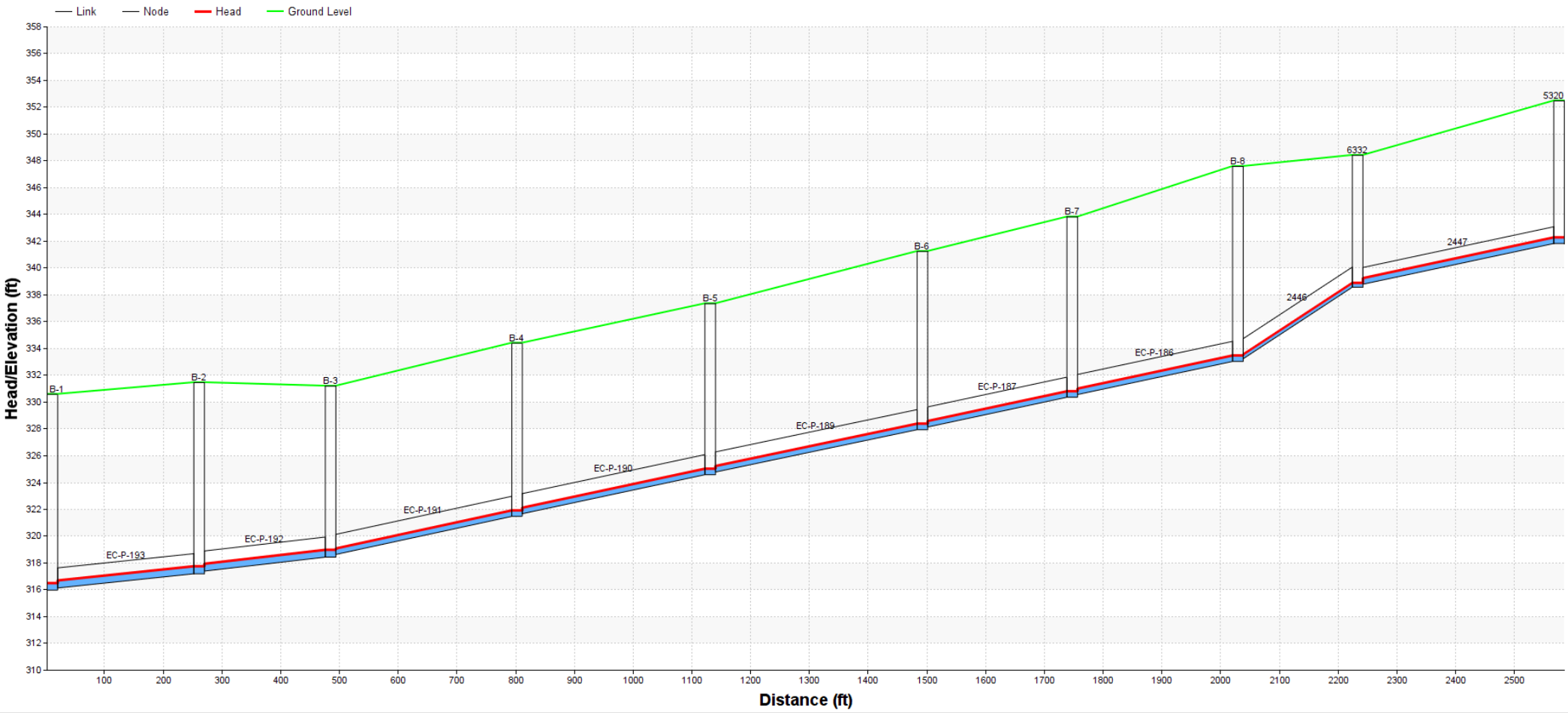
Sewer Line C – Existing PWWF



Sewer Line B – Existing PWWF

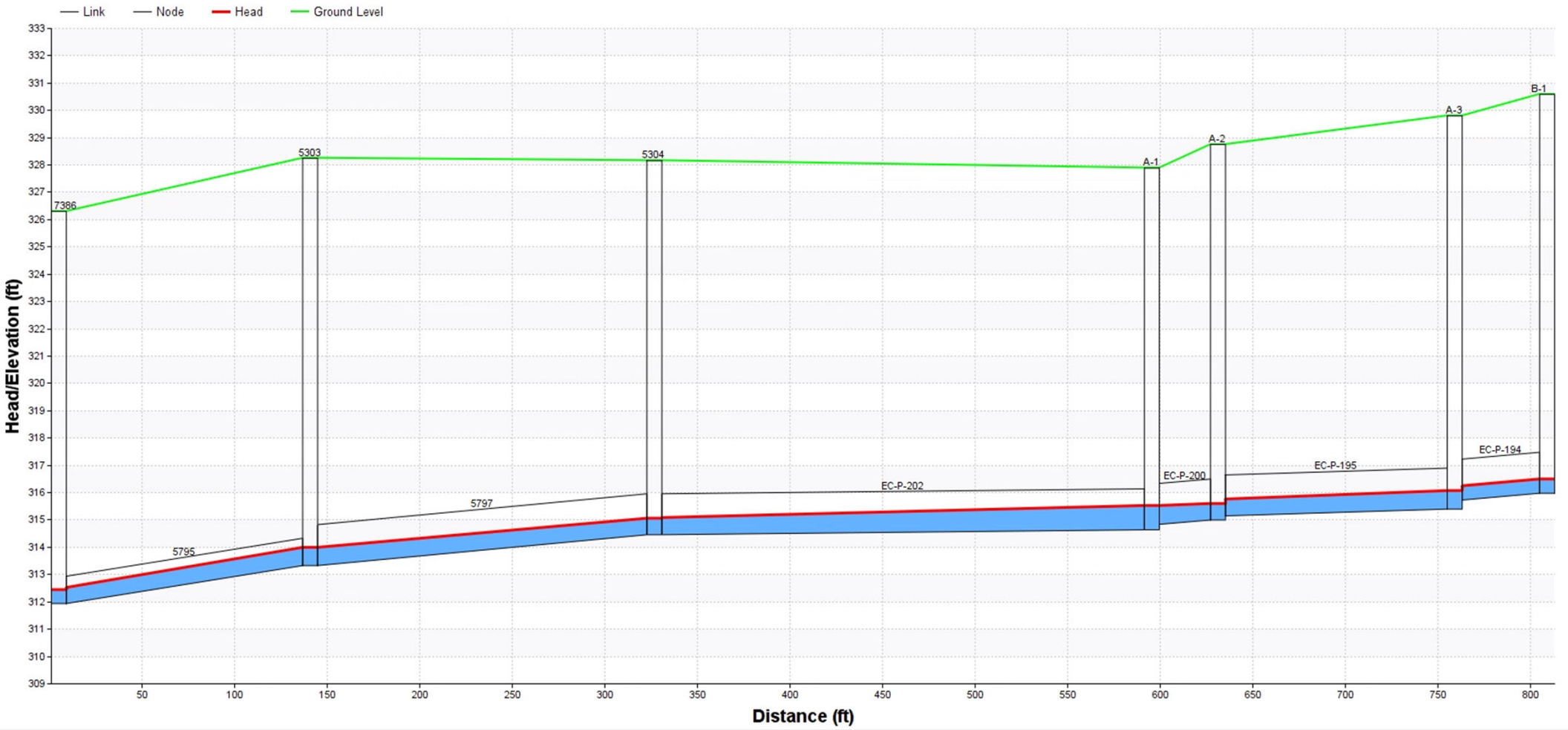


Sewer Line B – Existing PWWF



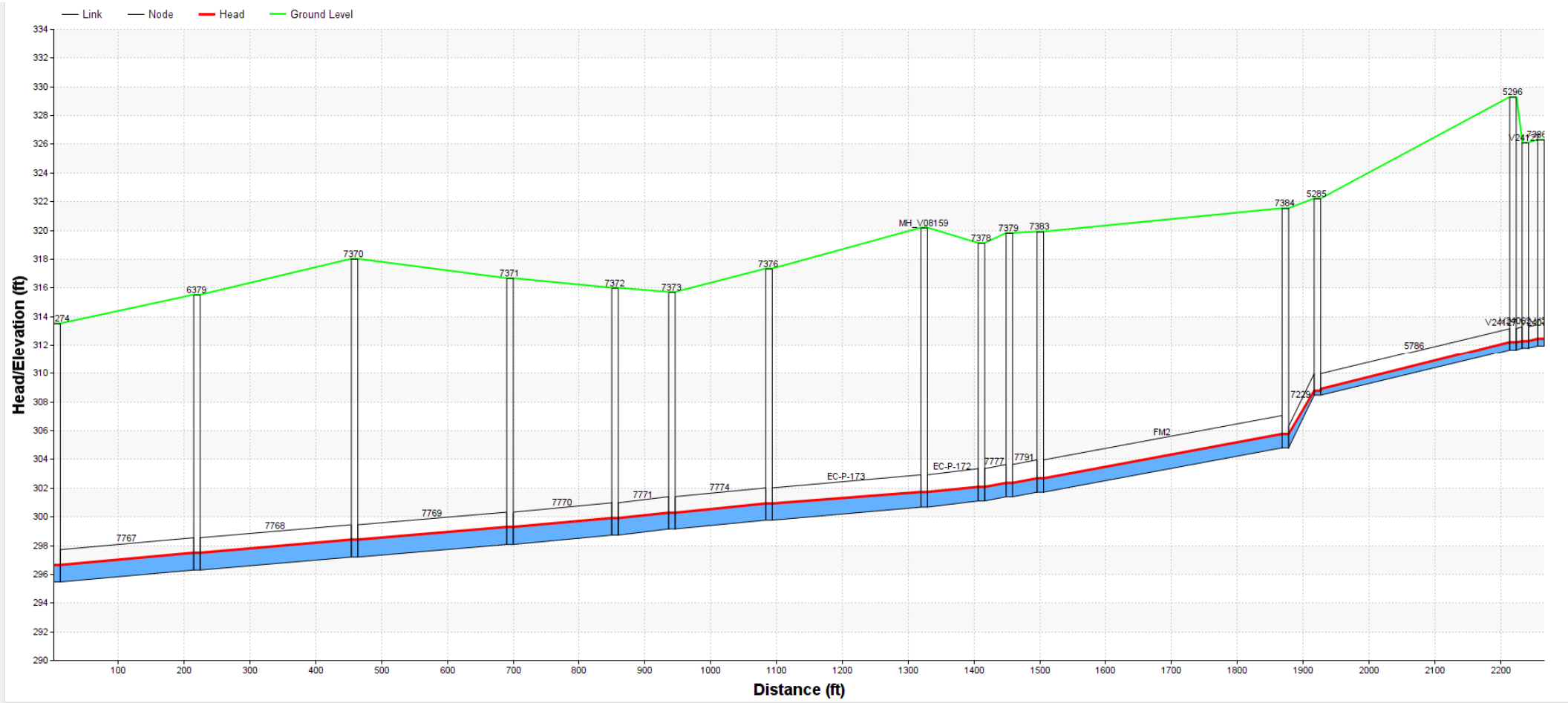
Sewer Line A – Existing PWWF

Sewer Line A – Existing PWWF



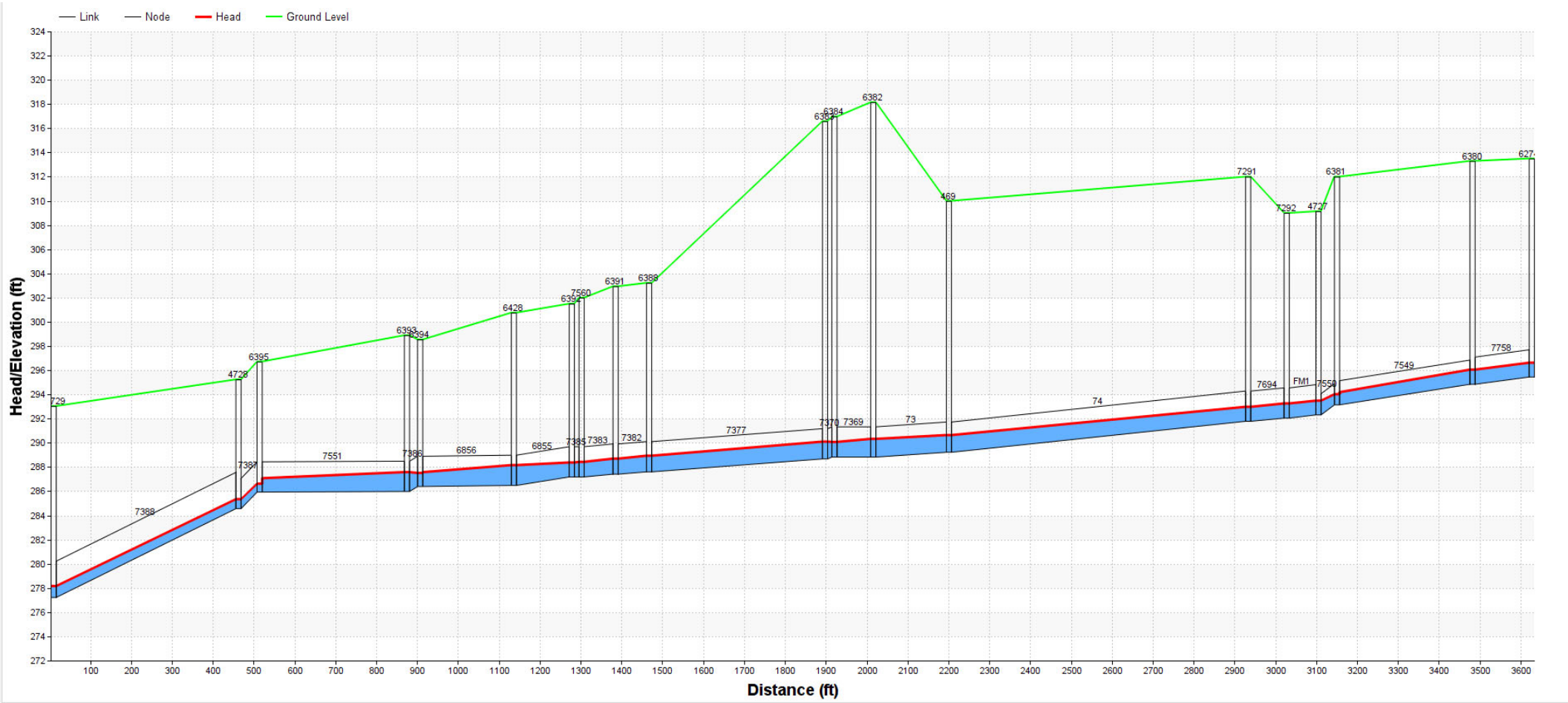

Reach 1 – Existing PWWF
Vista Village Dr
BURGER KING
Fruttos Yogurt
AT&T
Wave Waterpark
Wave Waterpark
Buena Vista Creek
Buena Vista Creek
Wave Dr
Eddie Dr
Peters Dr
Lado de Loma Dr
Lado de Loma Dr
Santa Fe Ave
Veterans Memorial Park
Sprinter
7767
7768
7769
7770
7771
7774
EC-P-173
EC-P-172
7791
FM2
7229
5786

Reach 1 – Existing PWWF



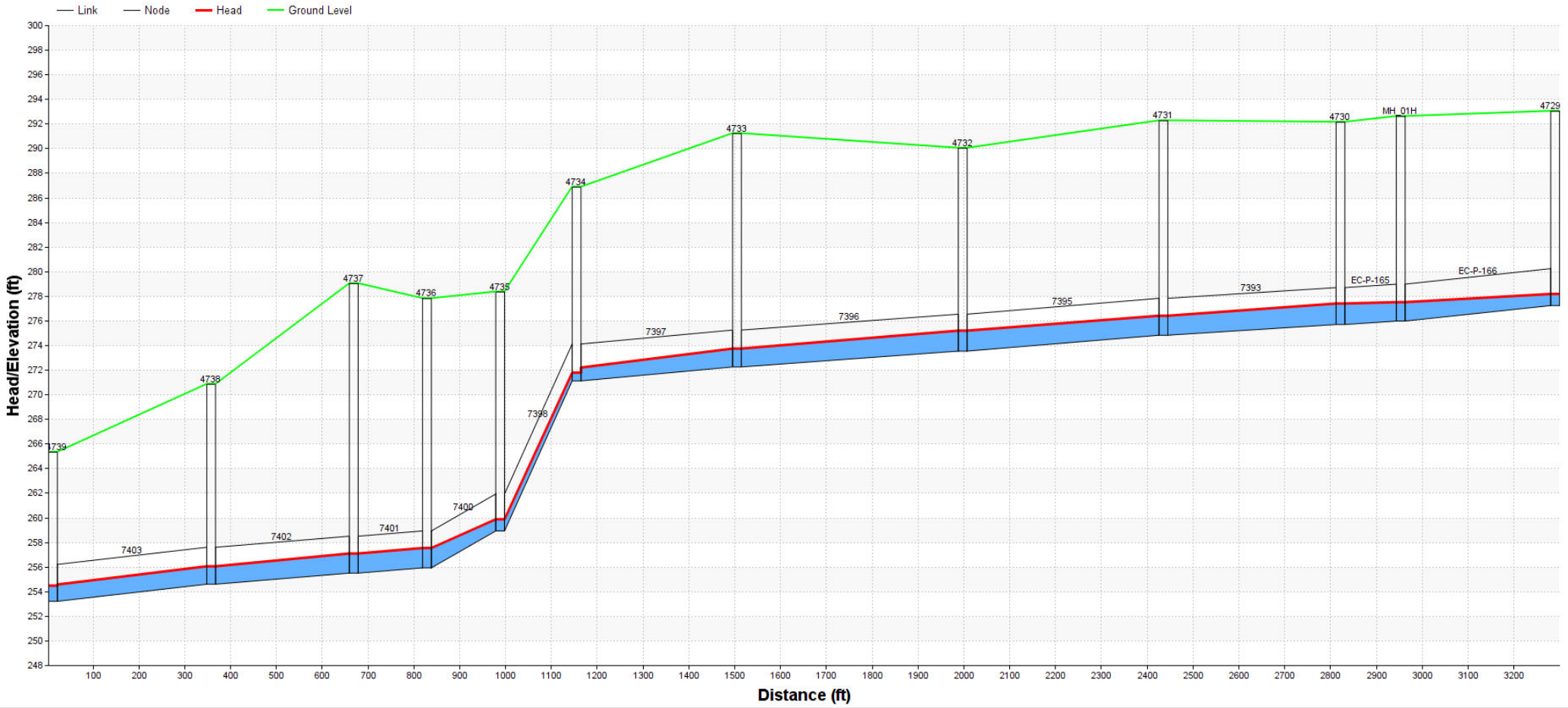
Reach 2 – Existing PWWF

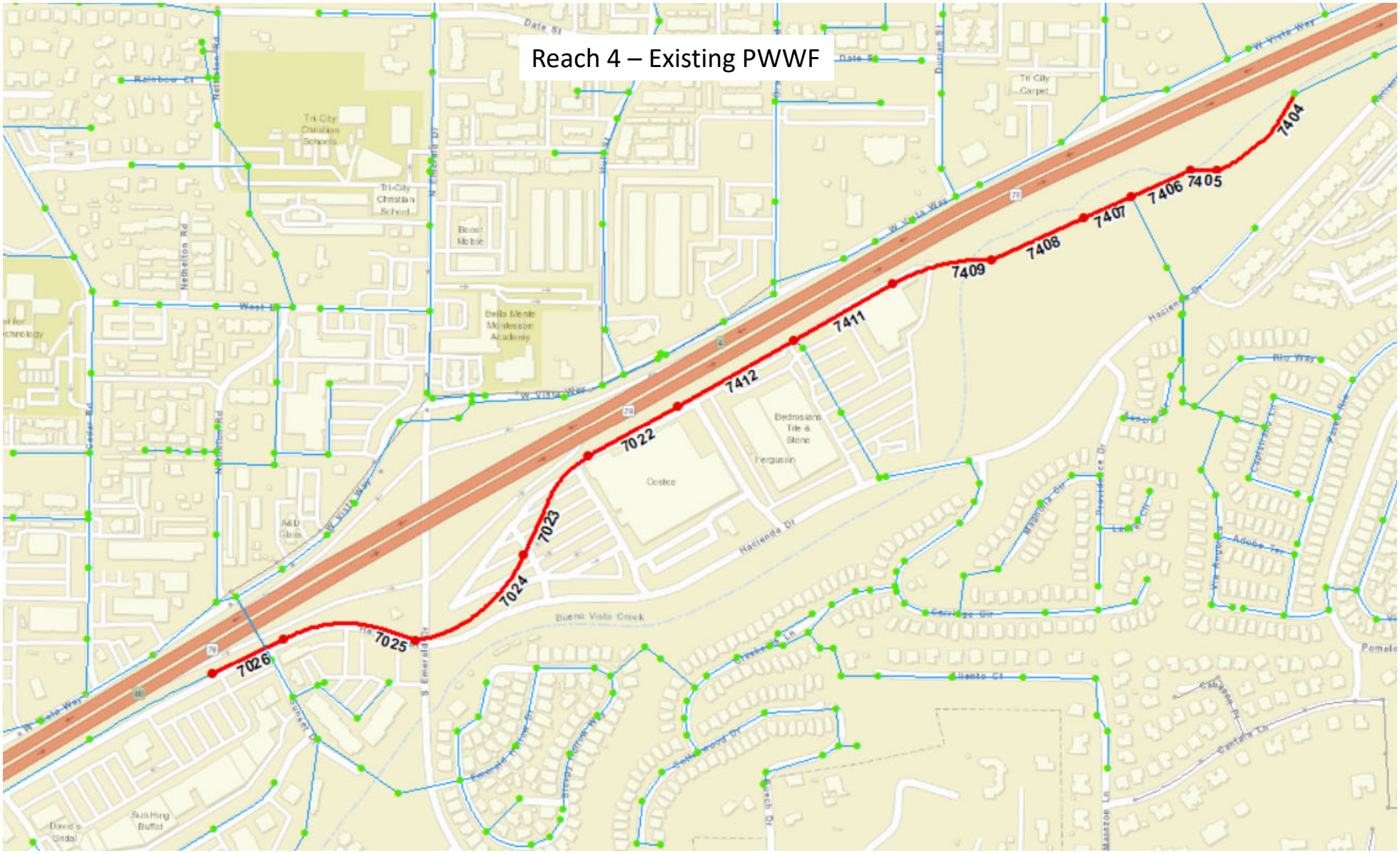
Reach 2 – Existing PWWF



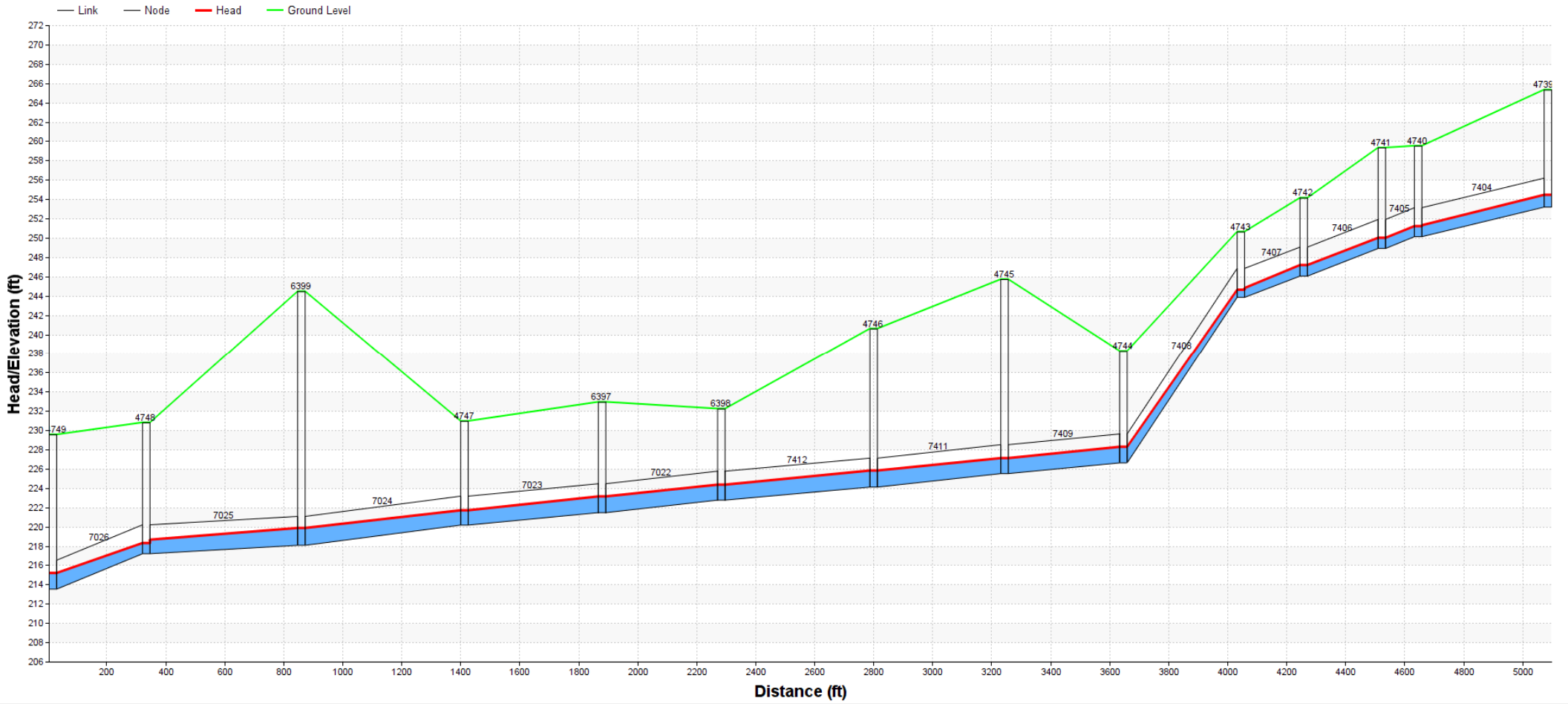

Reach 3 – Existing PWWF
W Vista Way
Hackamore Rd
Santa Clara Dr
Celosa Way
Copper Ave
Bass Ln
Bronze Way
Vista Inn
Santa Barbara Way
78
6A
7403
7402
7401
7400
7398
7397
7396
7395
7393
EC-P-165
EC-P-166
Hacienda Dr
Ira Way
Soft Wind Rd
Wandering Rd
Breeze Hill Rd
Margo Pl
Pomelo Dr
Jobe Hill Dr
La Tortuga Dr

Reach 3 – Existing PWWF

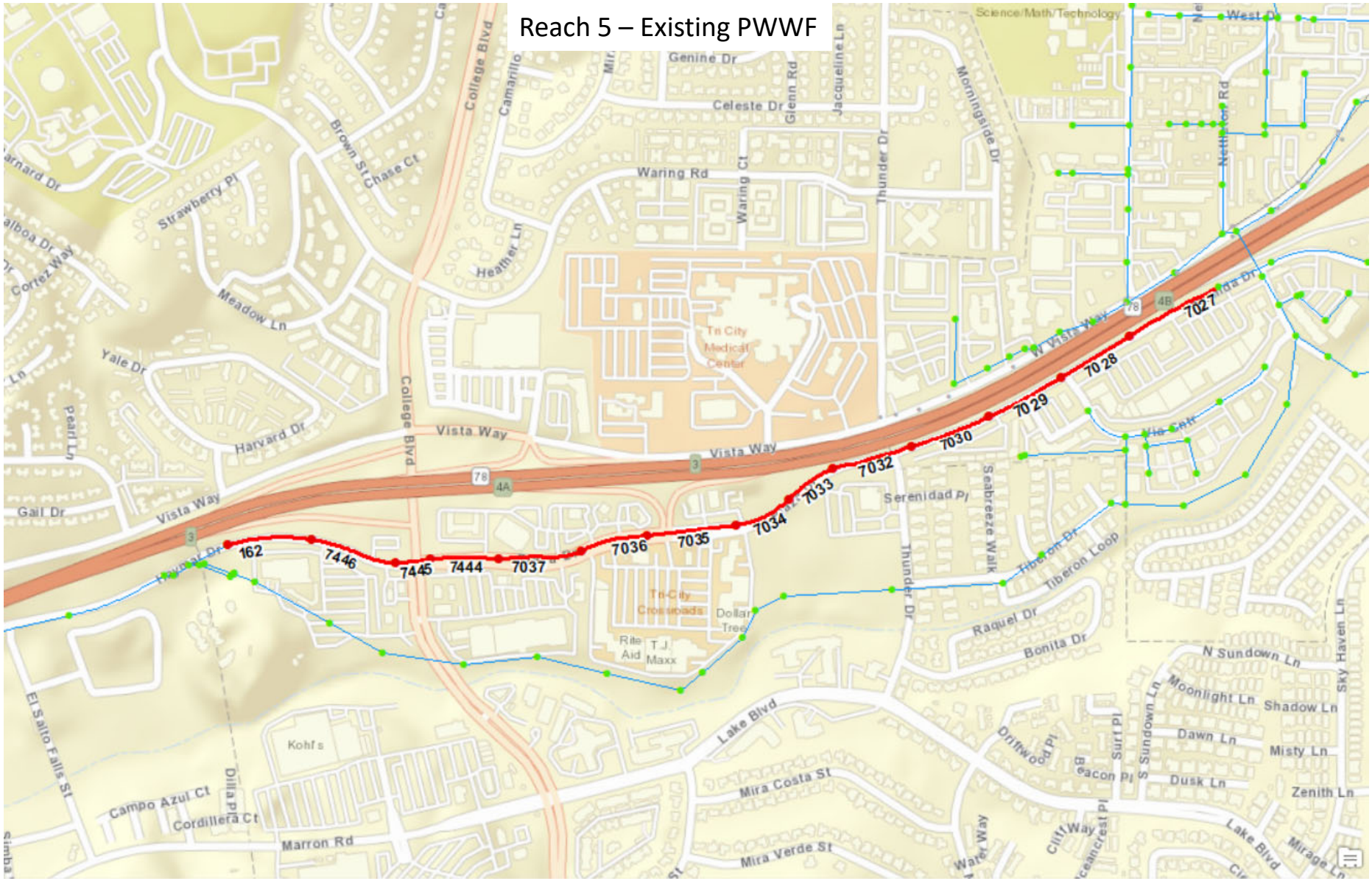



Reach 4 – Existing PWWF
7026
7025
7024
7023
7022
7412
7411
7409
7408
7407
7406
7405
7404
Costco
Bedrosians Tile & Stone
Ferguson
Bella Mente Montessori Academy
Tri-City Christian Schools
Buena Vista Creek
Hacienda Dr
W Vista Way
Date St
Rainbow Ct
Nettleton Rd
West Ln
S Emerald Dr
Sunset Dr
Rio Way
Sunset Ln
Sun Hing Buffet

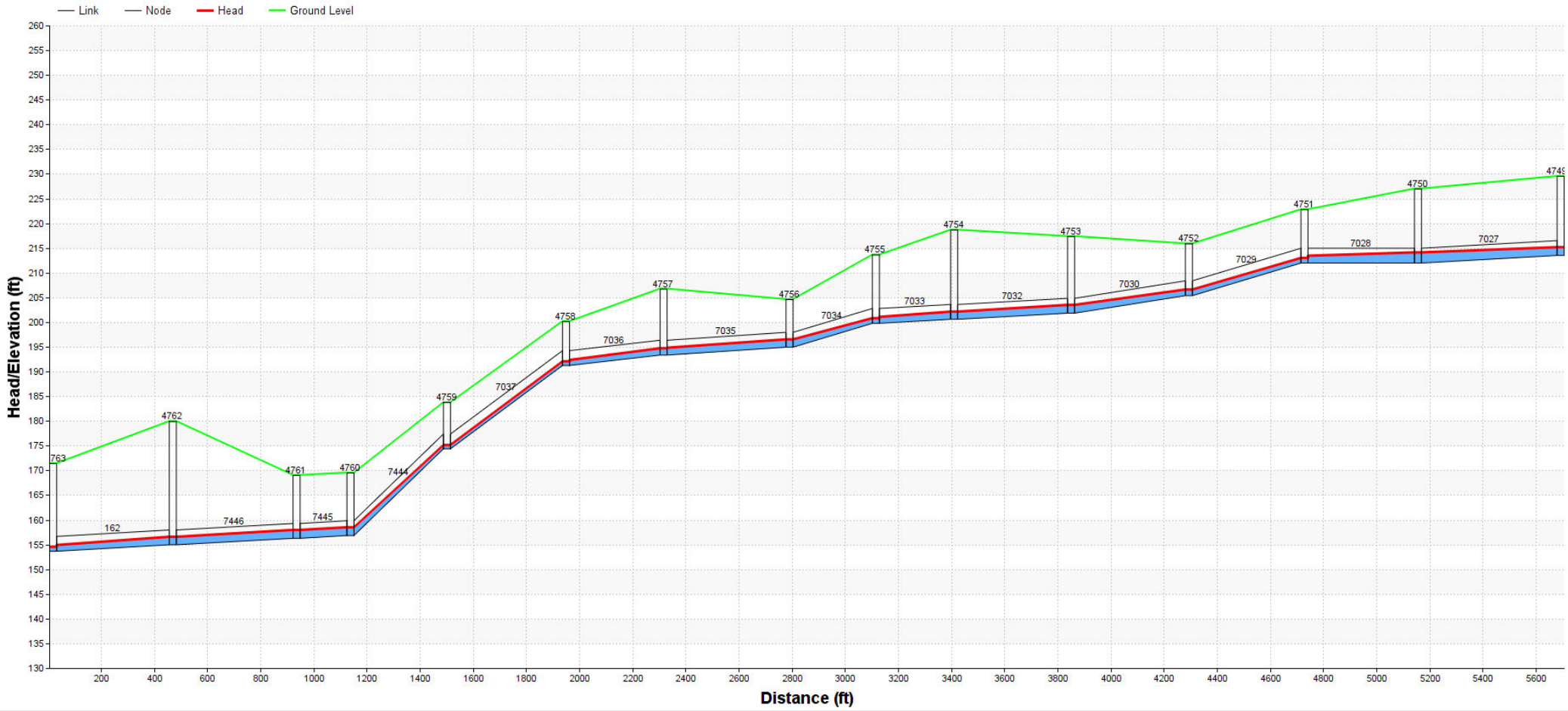
Reach 4 – Existing PWWF



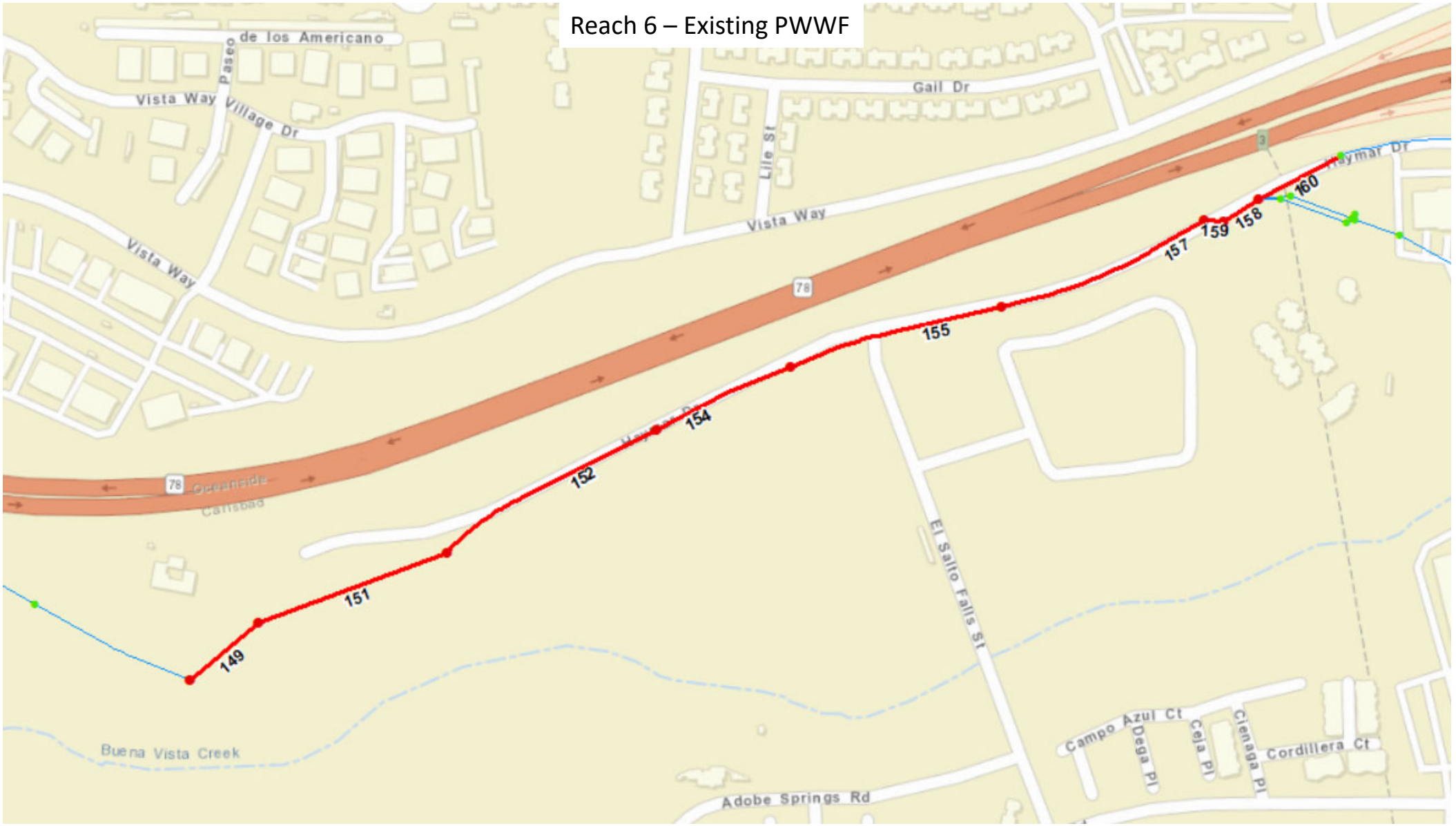
Reach 5 – Existing PWWF



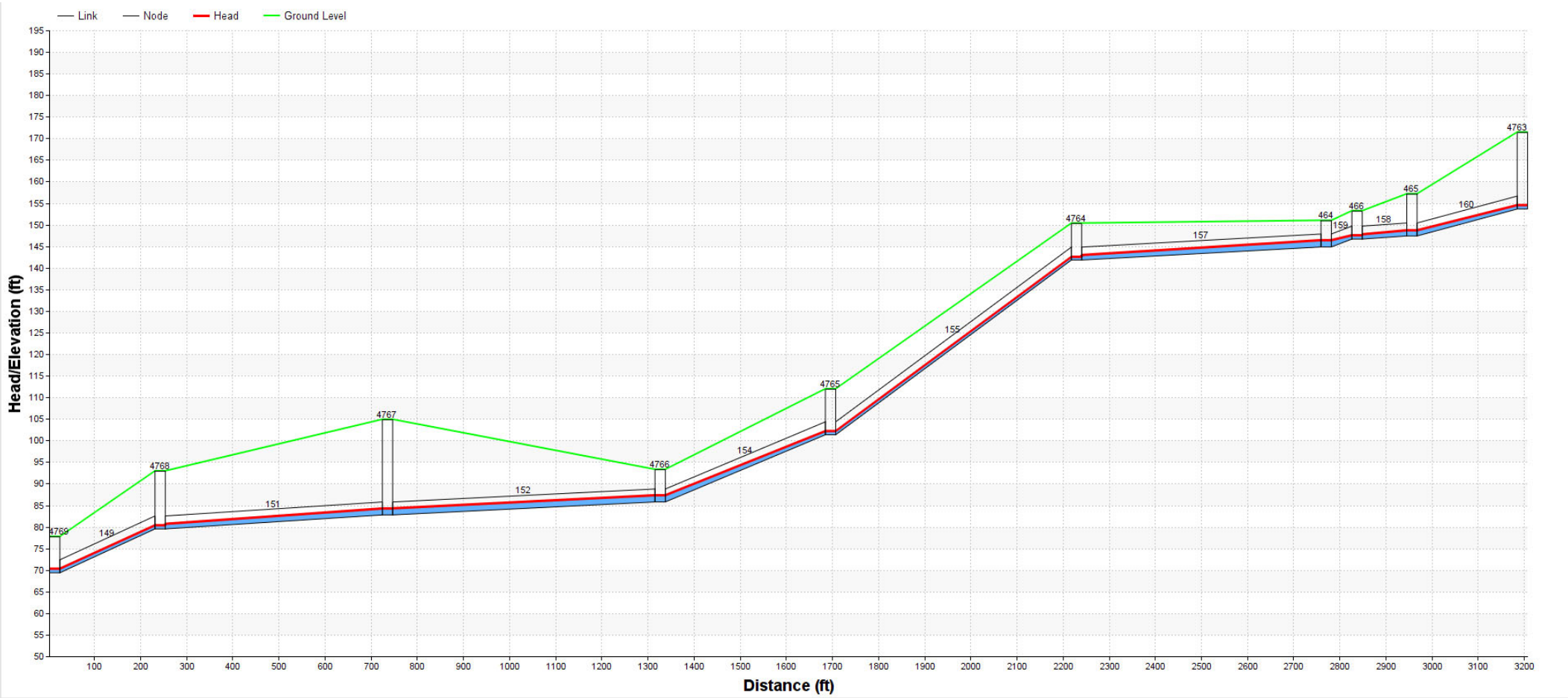
Reach 5 – Existing PWWF



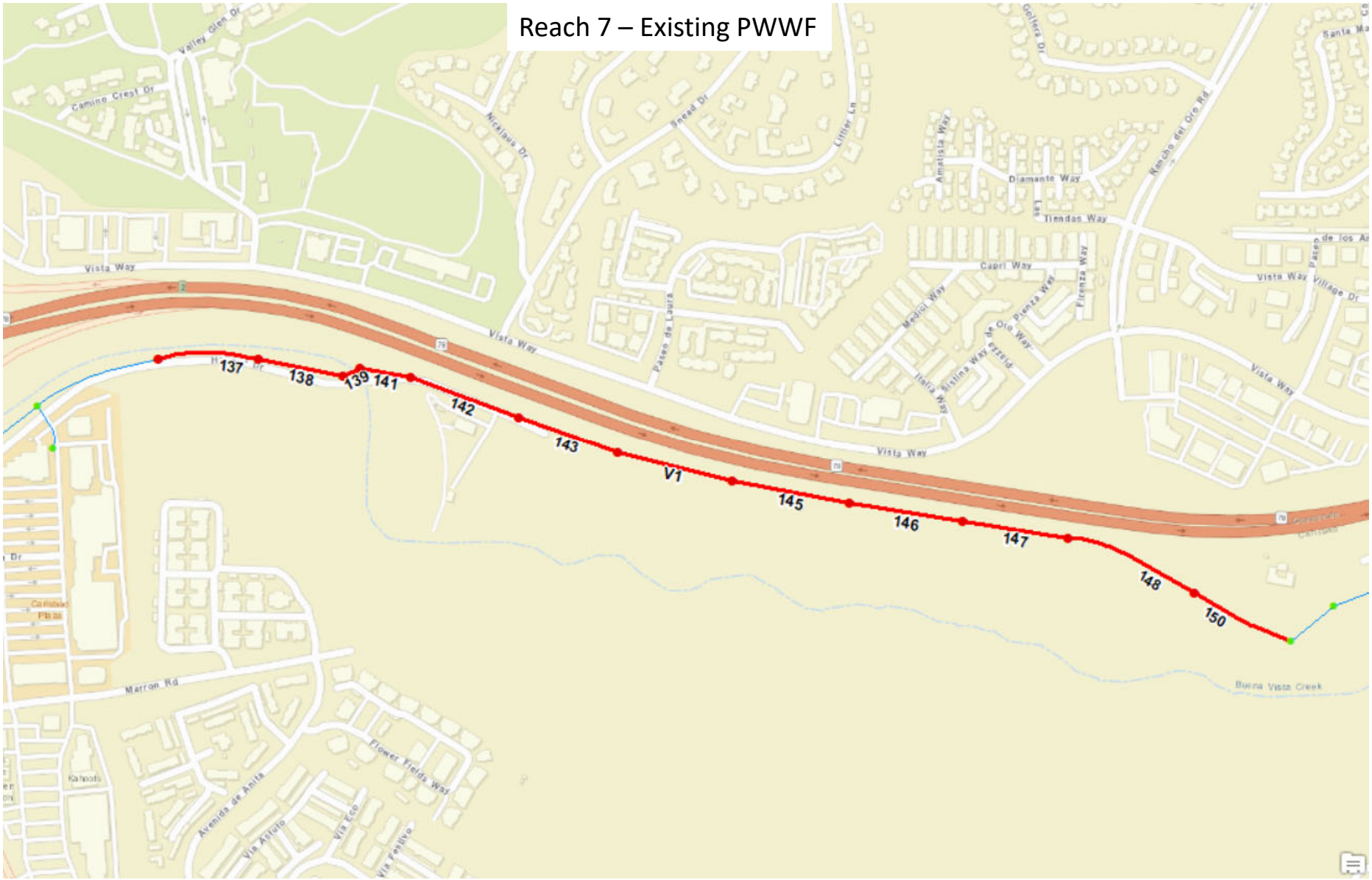
Reach 6 – Existing PWWF



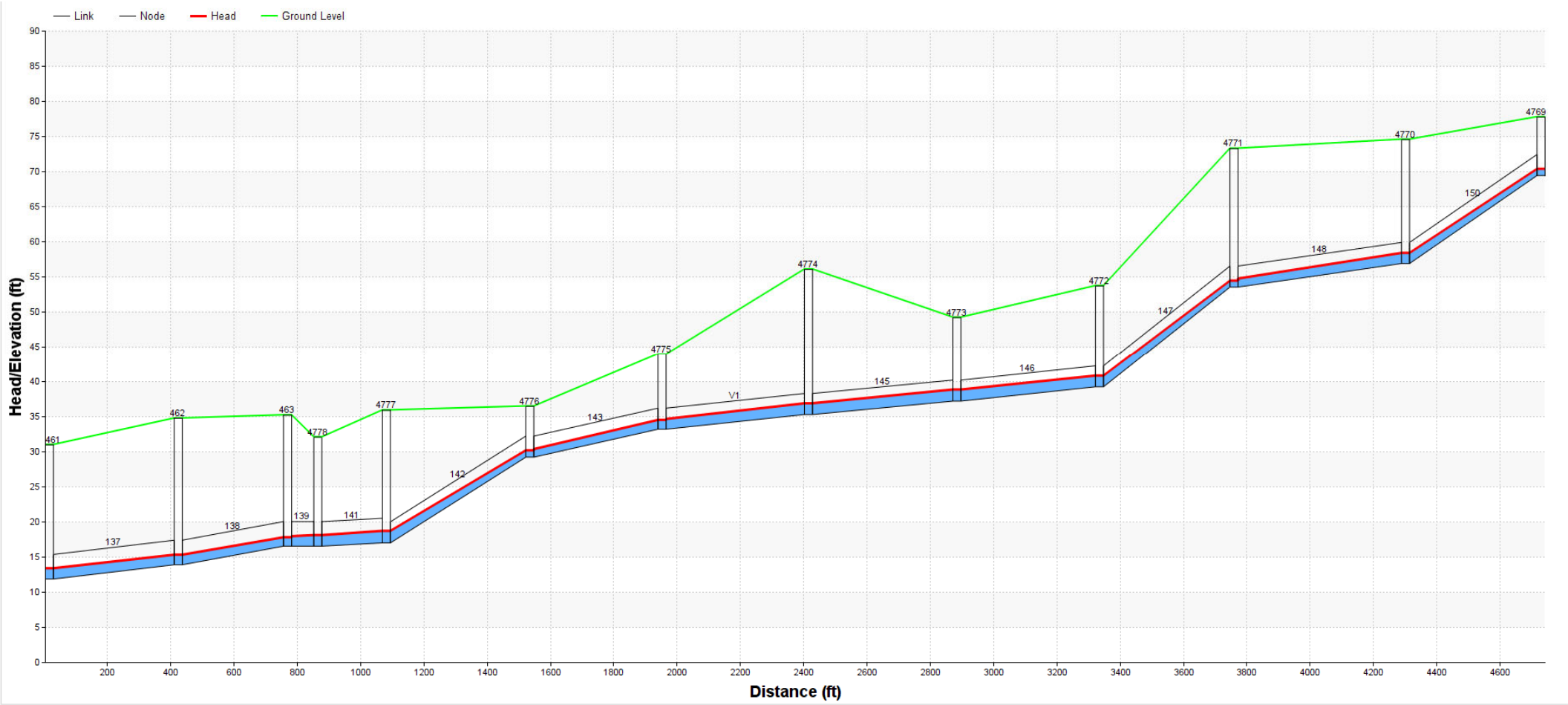
Reach 6 – Existing PWWF



Reach 7 – Existing PWWF

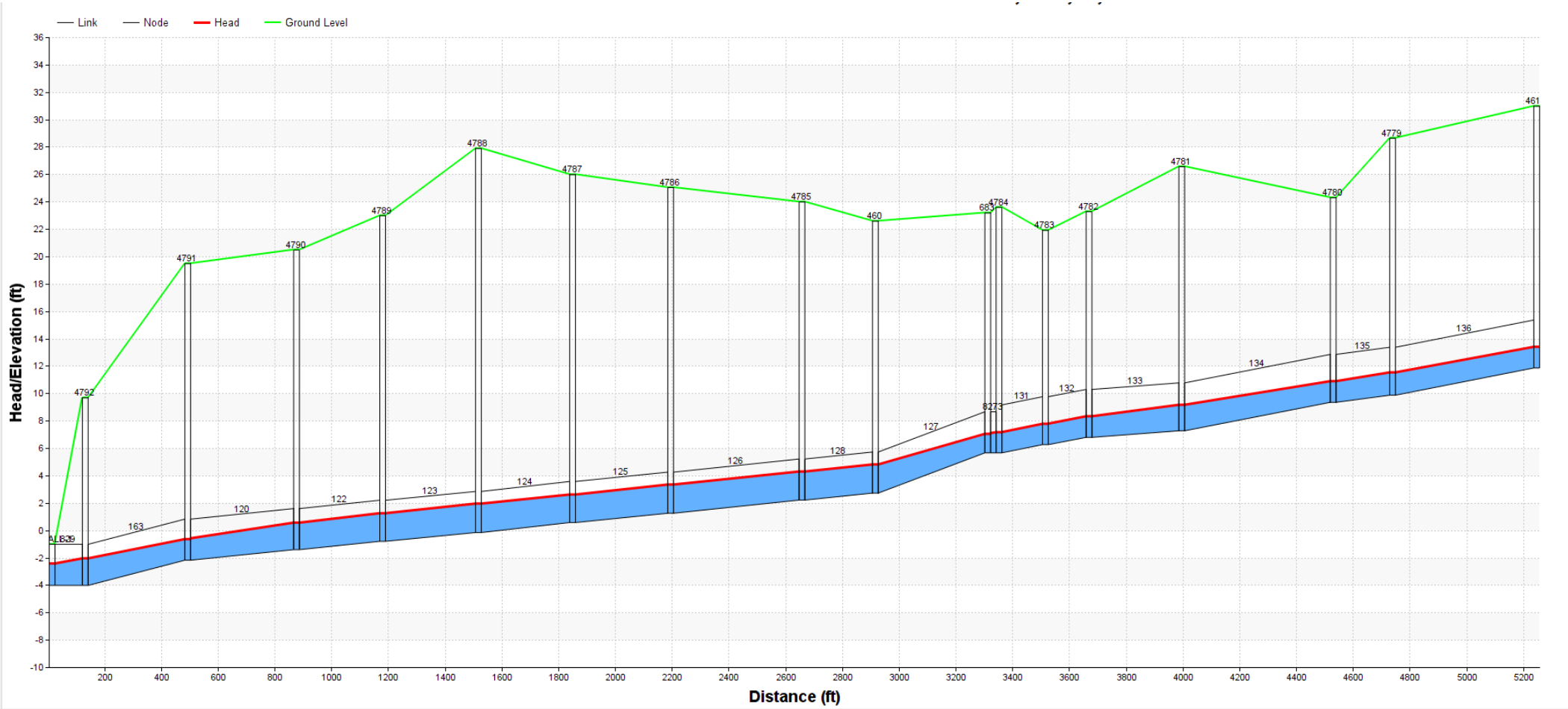


Reach 7 – Existing PWWF




Reach 8 – Existing PWWF
829
163
120
122
123
124
125
126
128
127
131
132
133
134
135
136
Ivy Rd
Vista Way
Olson Way
Sears
El Camino North
Ulta
Union Bank
El Torito
Town and Country
Camino Crest Dr
78
1C
2
S Vista Way
Oceanside
Carlsbad
Buena Vista Creek
Monroe St
El Camino Real
Carlsbad Plaza
Dollar Tree
Westfield Plaza Camino Real
North County Plaza
Audeo Charter II
Plaza Dr
Marron Rd
Jefferson St
Hosp Grove Park
Ratcliff Rd
Guevara Rd
Avenida Magnifica
Hosp Way
Wintergreen Dr
Grove Ave

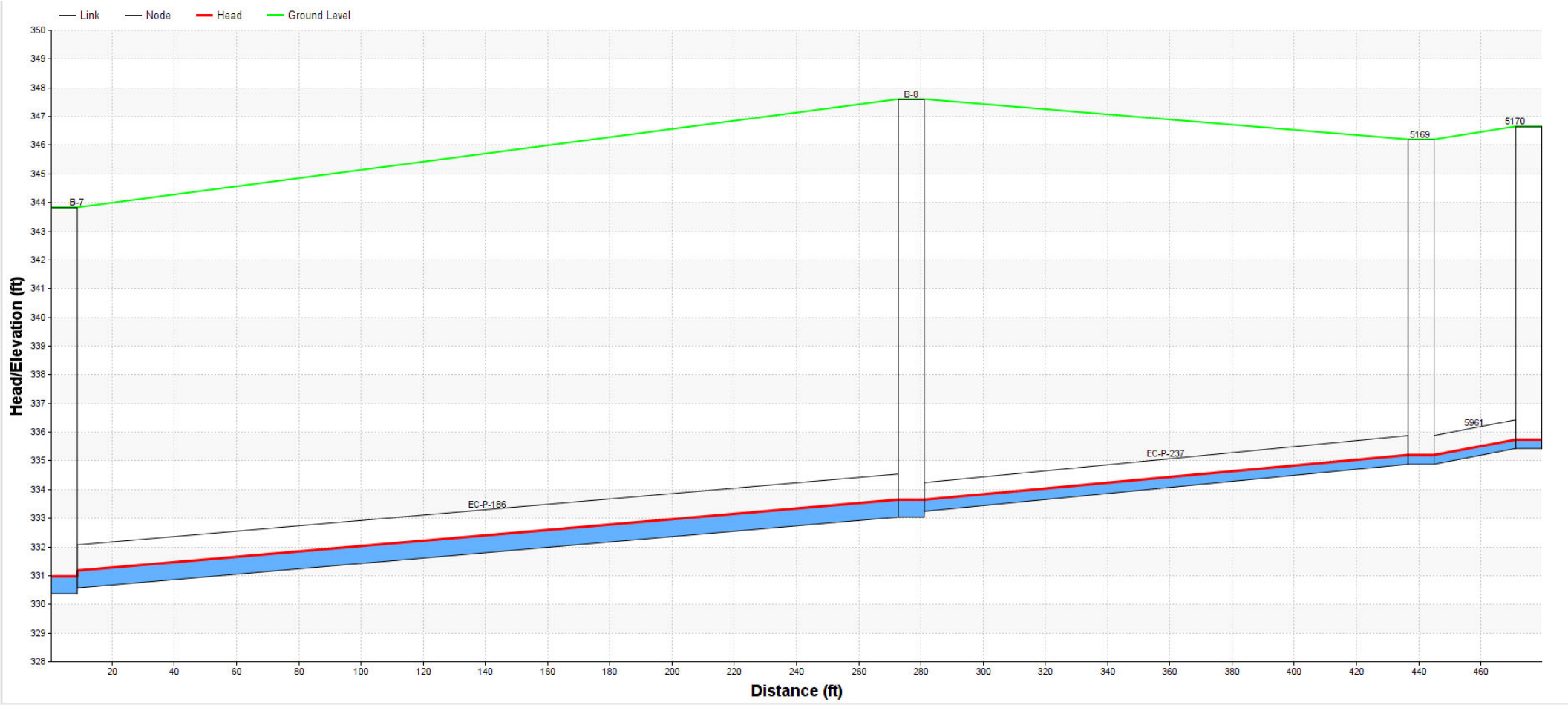
Reach 8 – Existing PWWF



Appendix E
Buildout System with CIP Upgrades
Peak Wet Weather Flow HGL Profiles

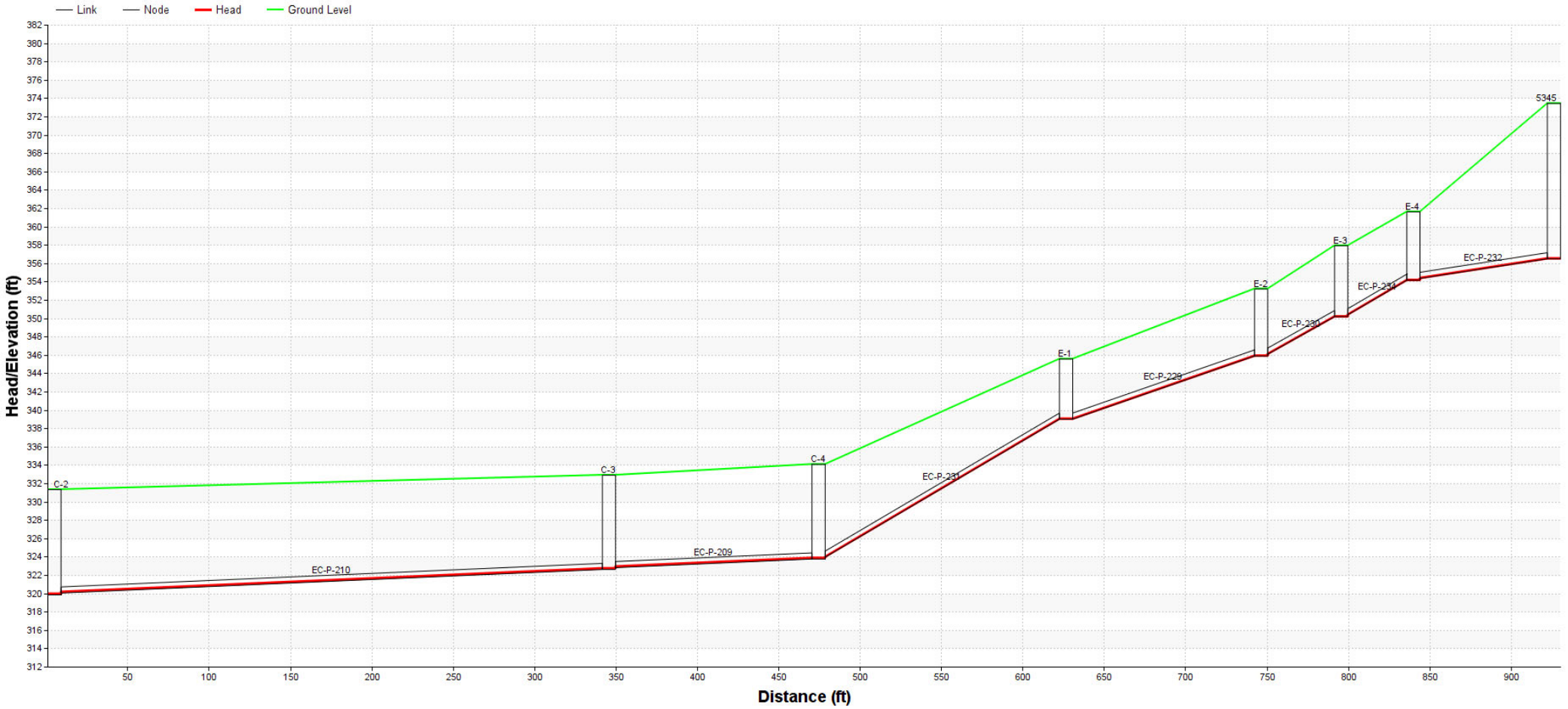
Sewer Line F – Buildout PWWF

Sewer Line F – Buildout PWWF



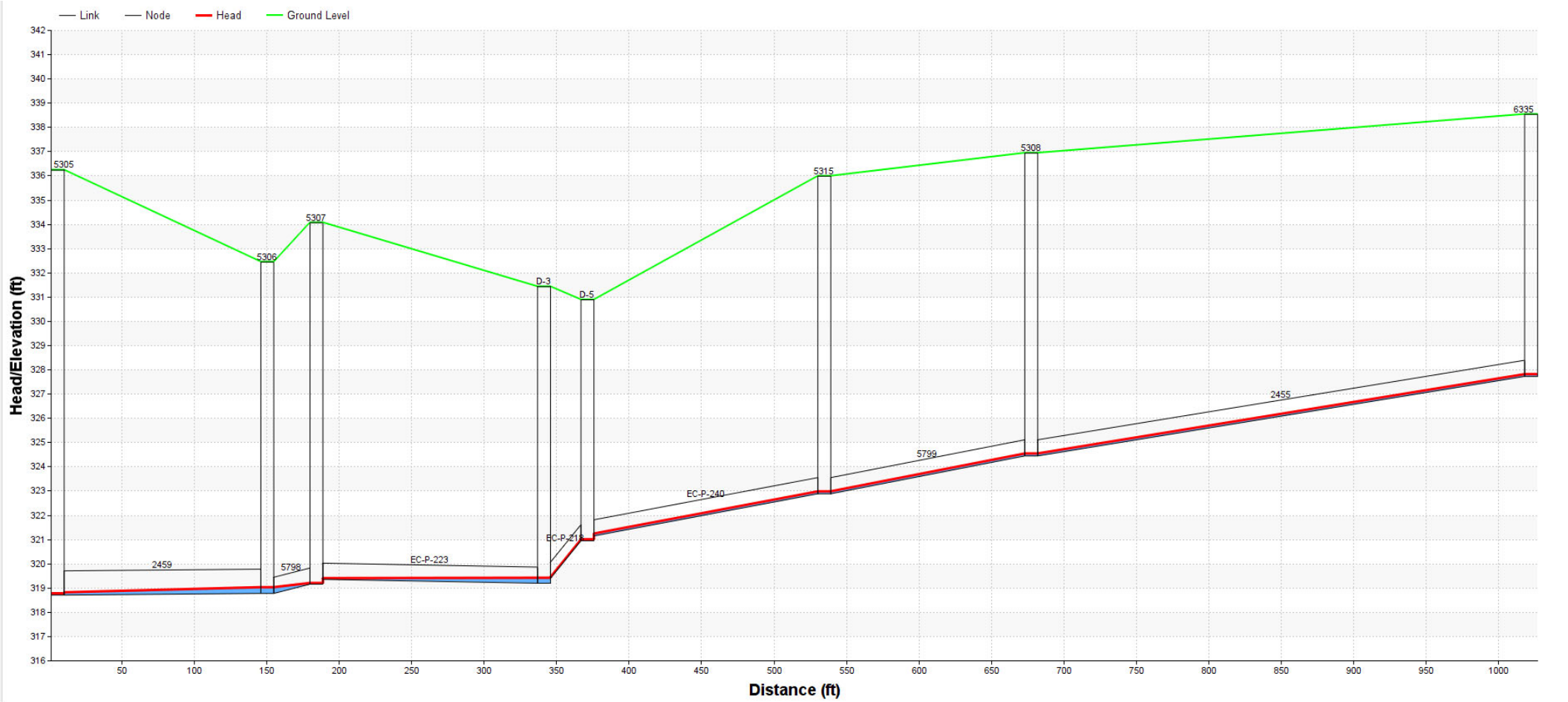

Sewer Line E – Buildout PWWF
S Santa Fe Ave
EC-P-210
EC-P-209
EC-P-231
EC-P-229
EC-P-230
EC-P-234
EC-P-232
Terrace Dr
101
501
531

Sewer Line E – Buildout PWWF



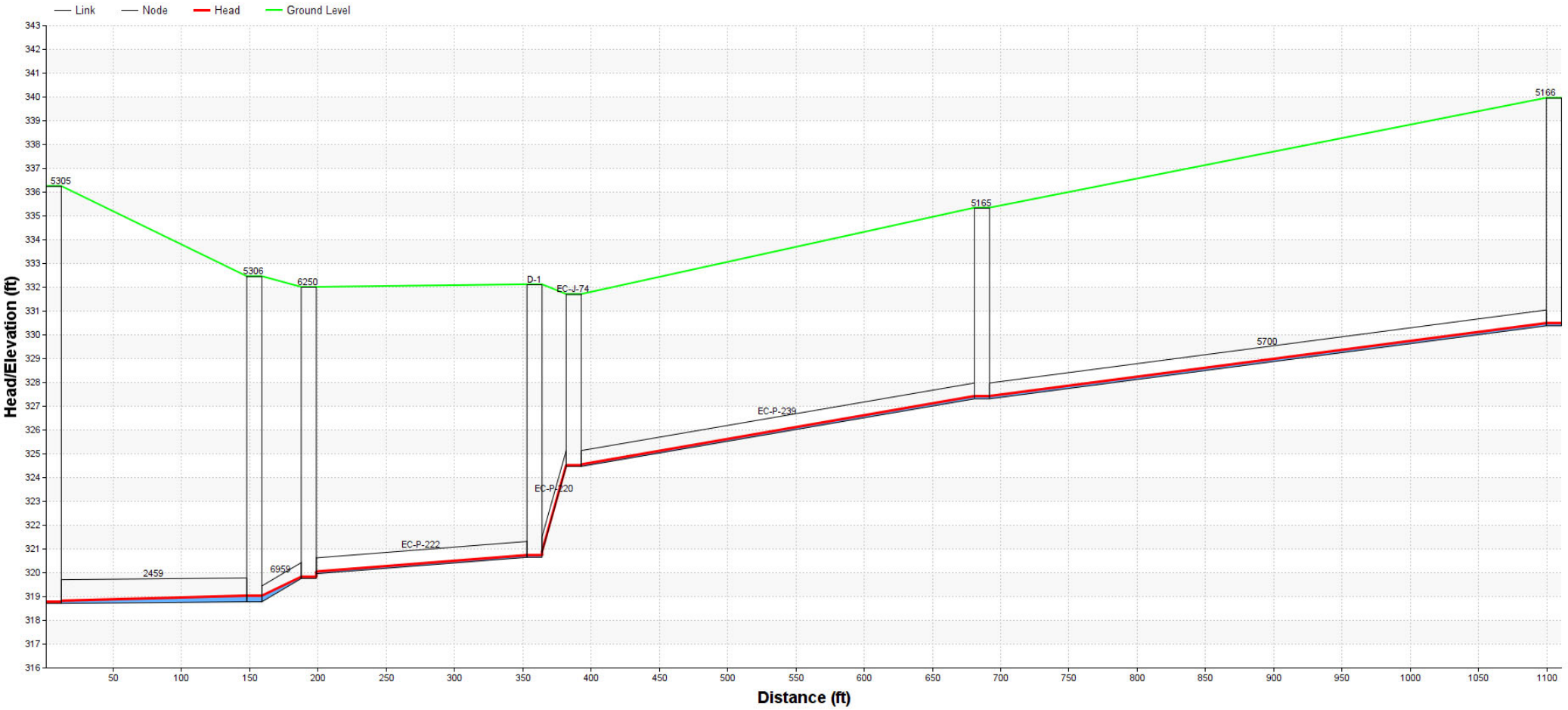
Sewer Line D 3 – Buildout PWWF

Sewer Line D 3 – Buildout PWWF



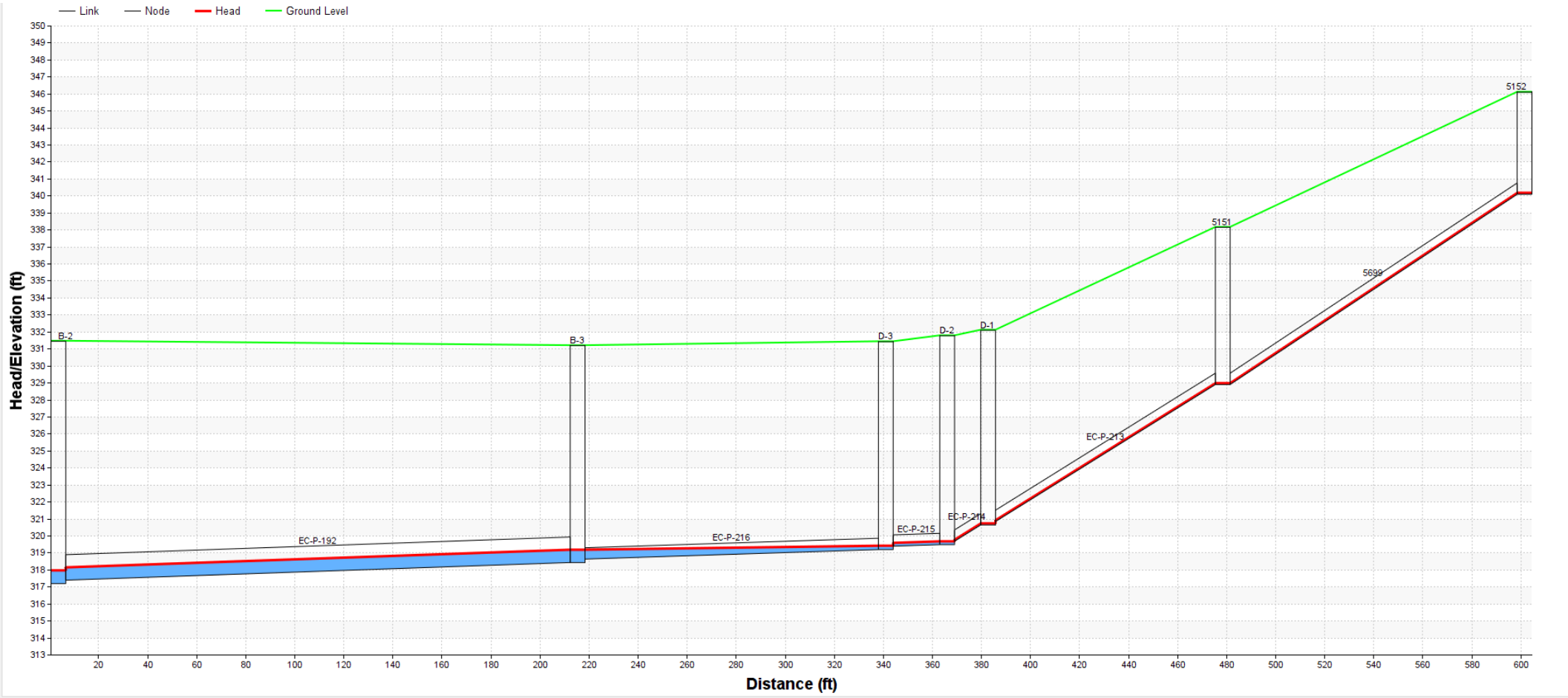
Sewer Line D 2 – Buildout PWWF

Sewer Line D 2 – Buildout PWWF

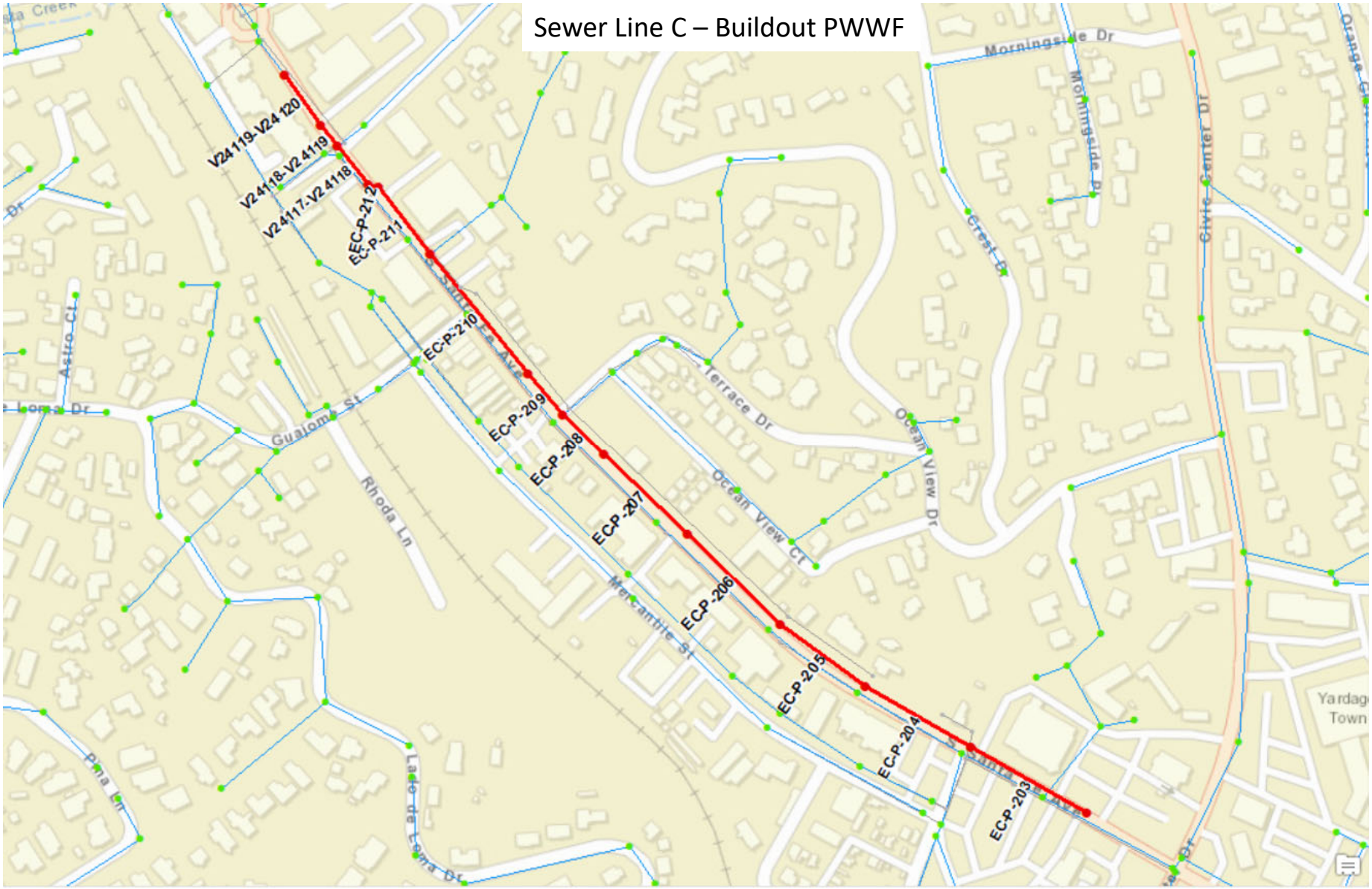



Sewer Line D – Buildout PWWF
EC-P-192
S Santa Fe Ave
EC-P-216
EC-P-215
EC-P-213
5699
Guajome St
Sprinter
Terrace Dr
Junction with Kenosha Development Flow Loading

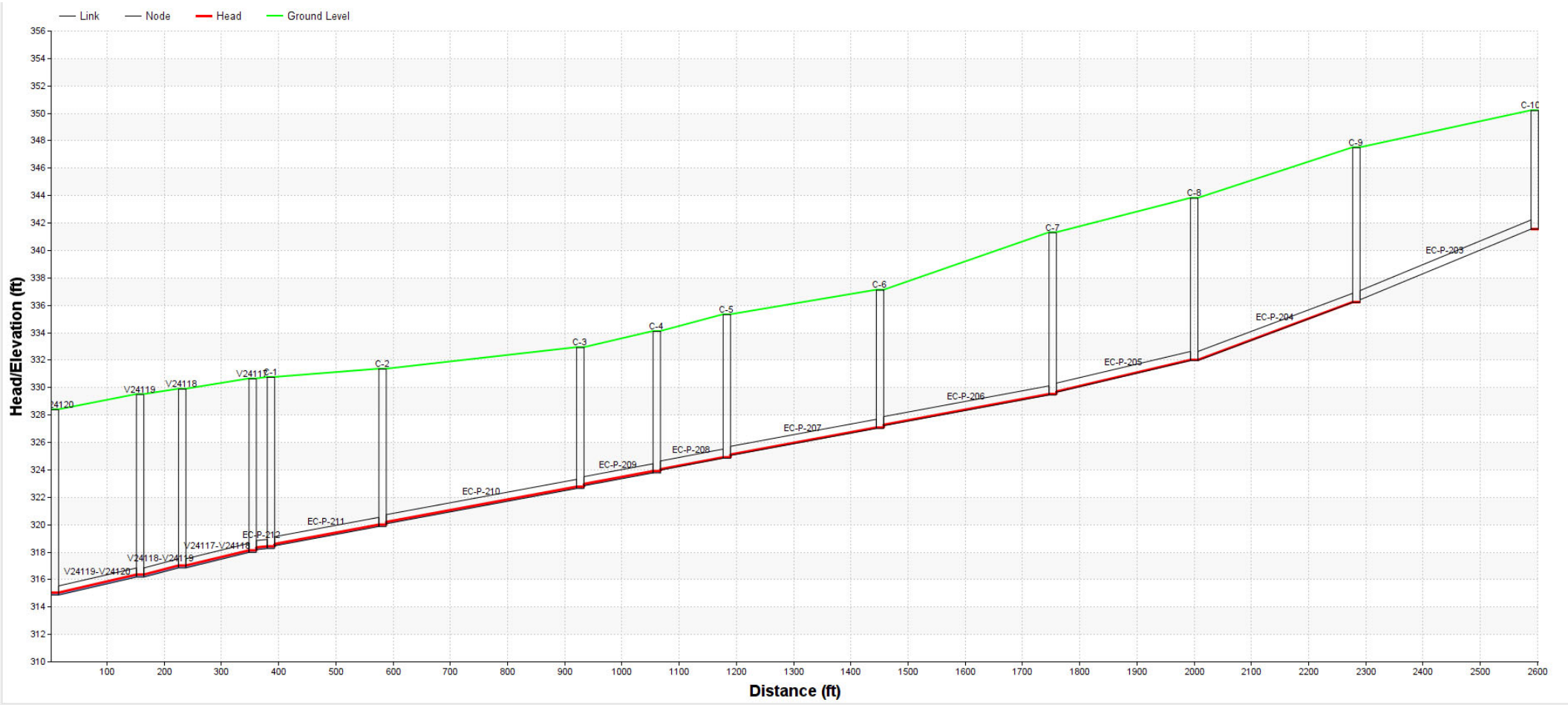
Sewer Line D – Buildout PWWF



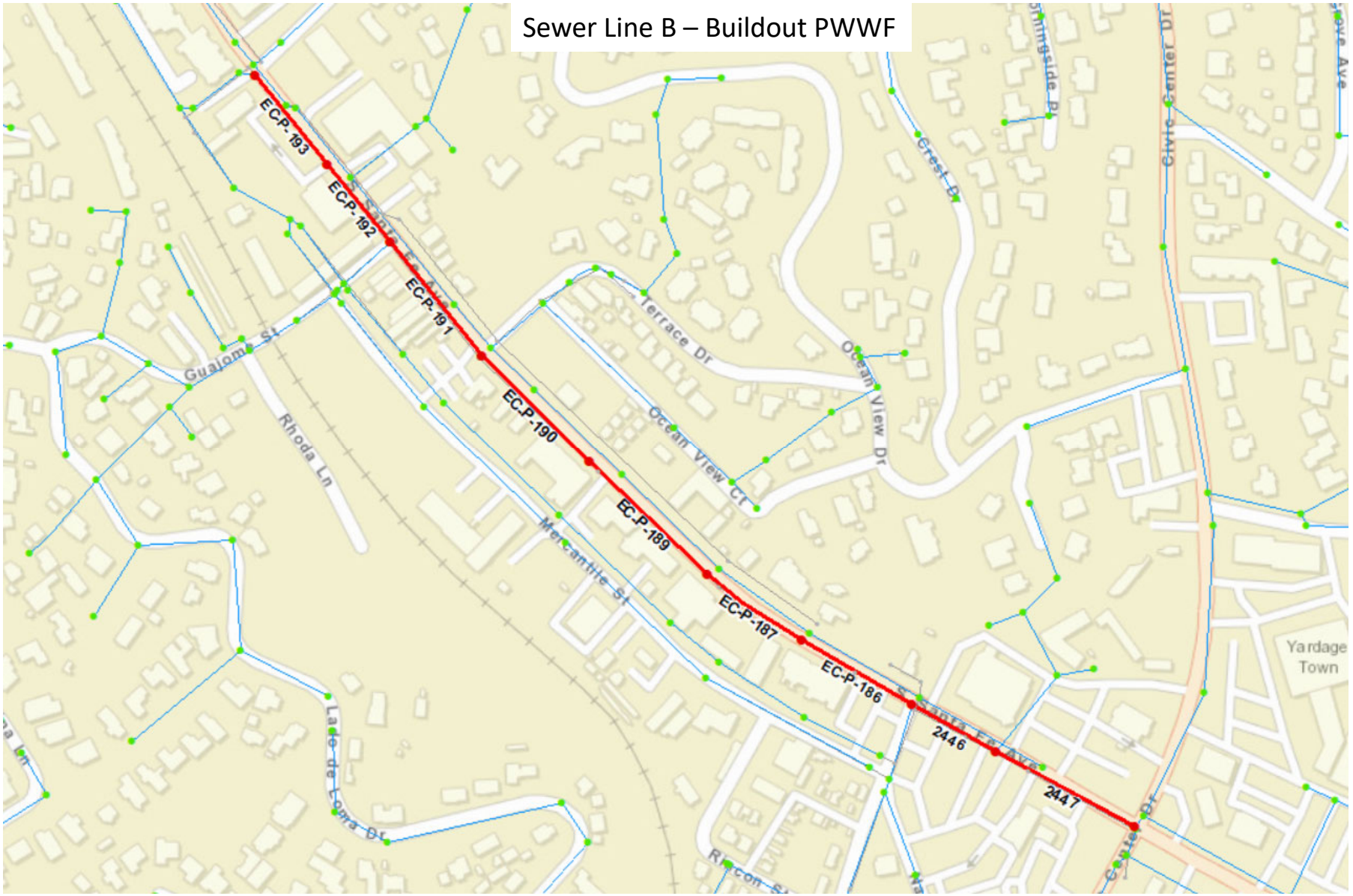
Sewer Line C – Buildout PWWF



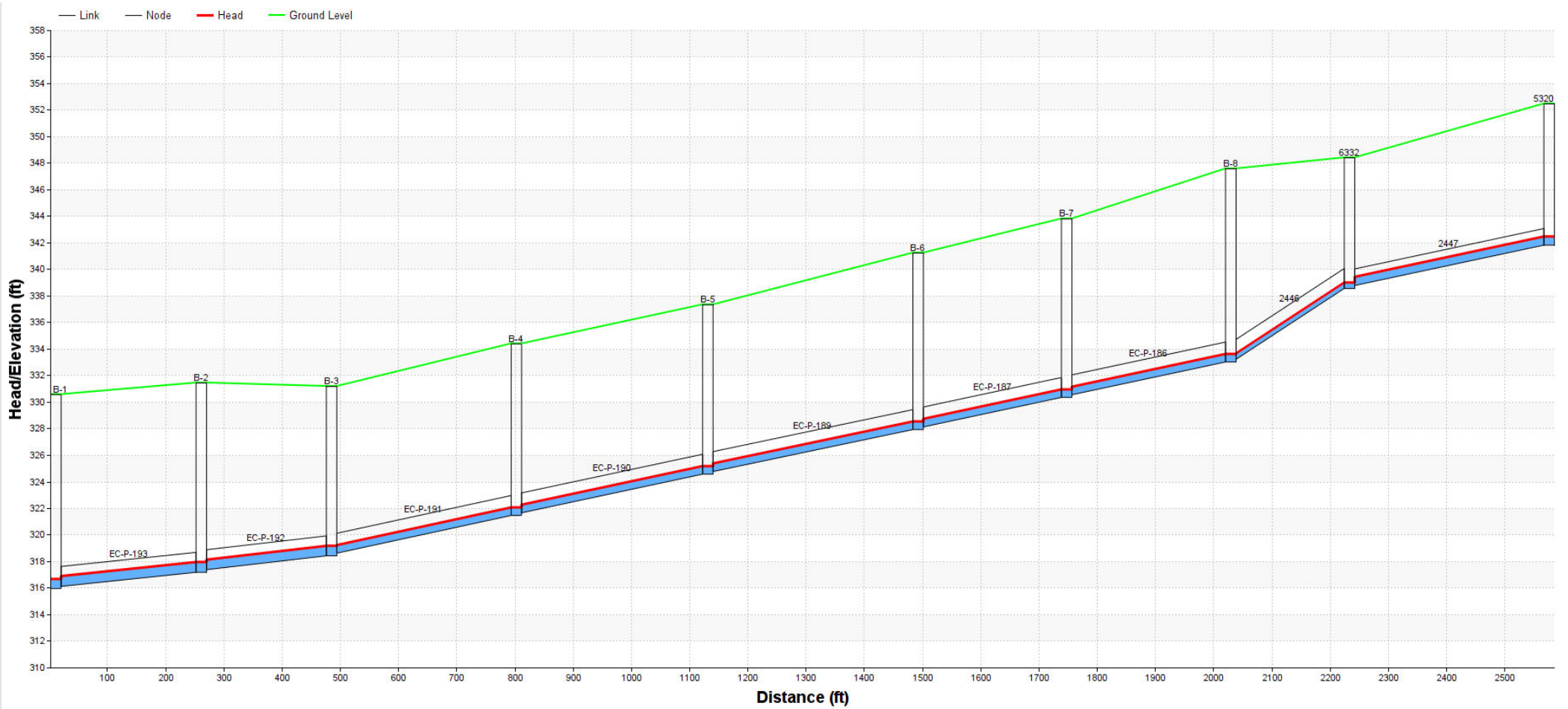
Sewer Line C – Buildout PWWF



Sewer Line B – Buildout PWWF

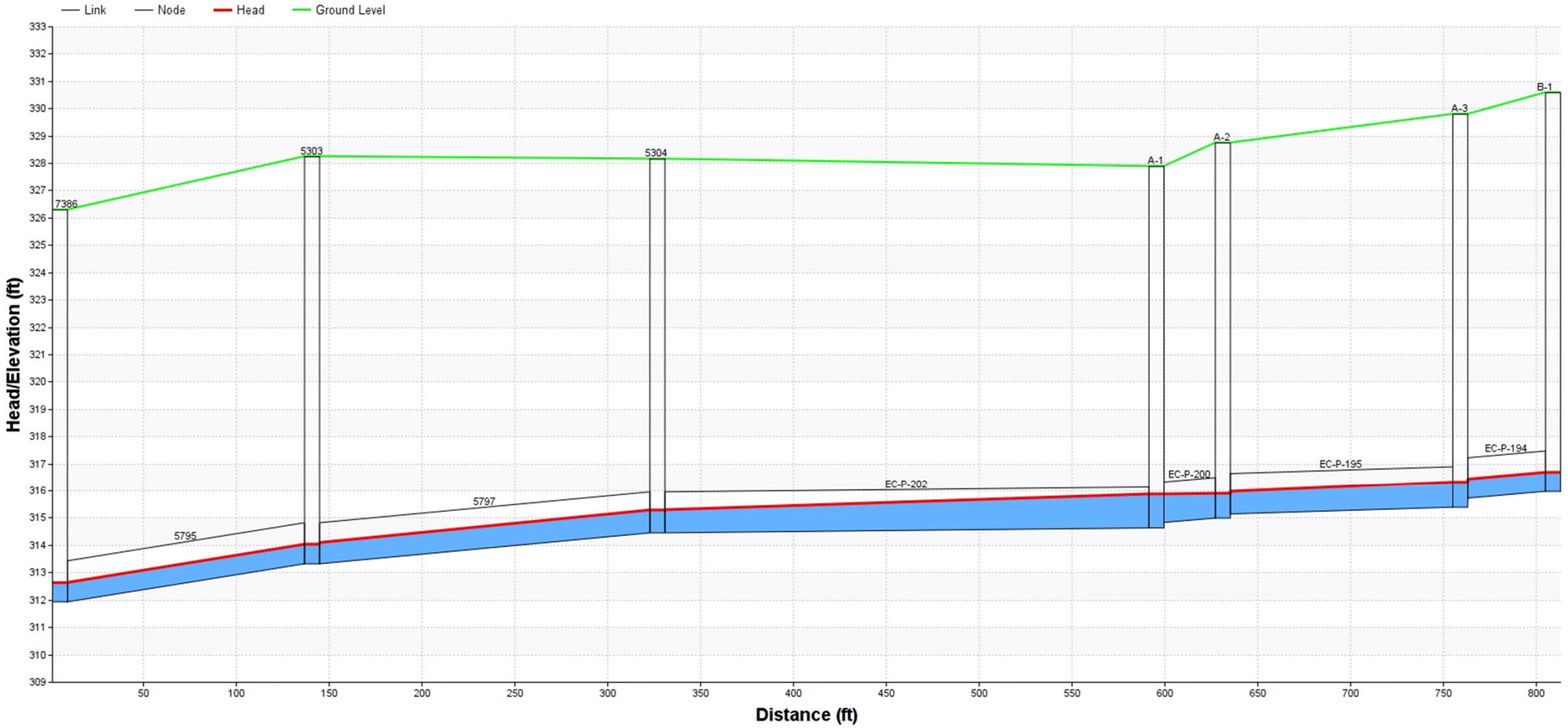


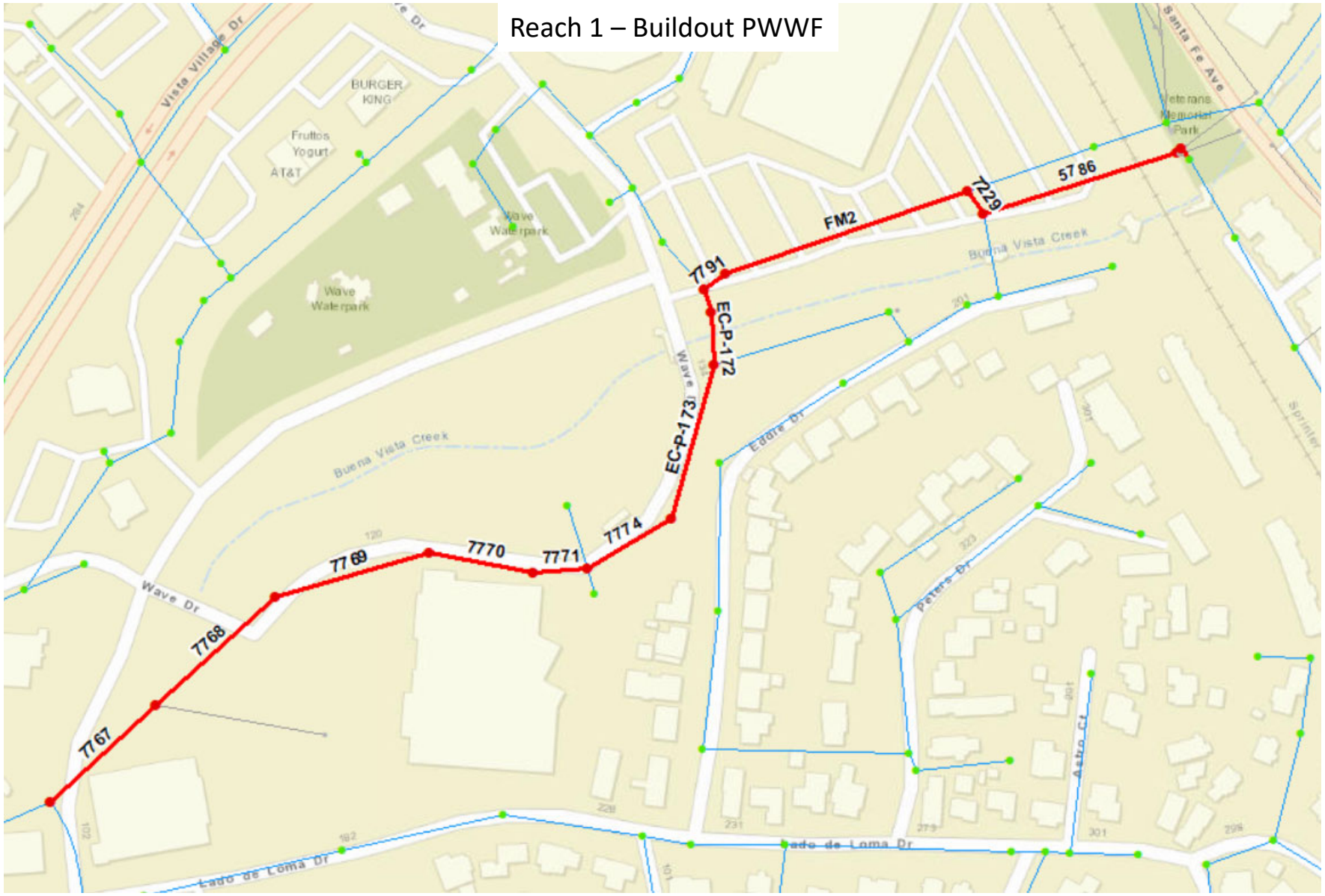
Sewer Line B – Buildout PWWF

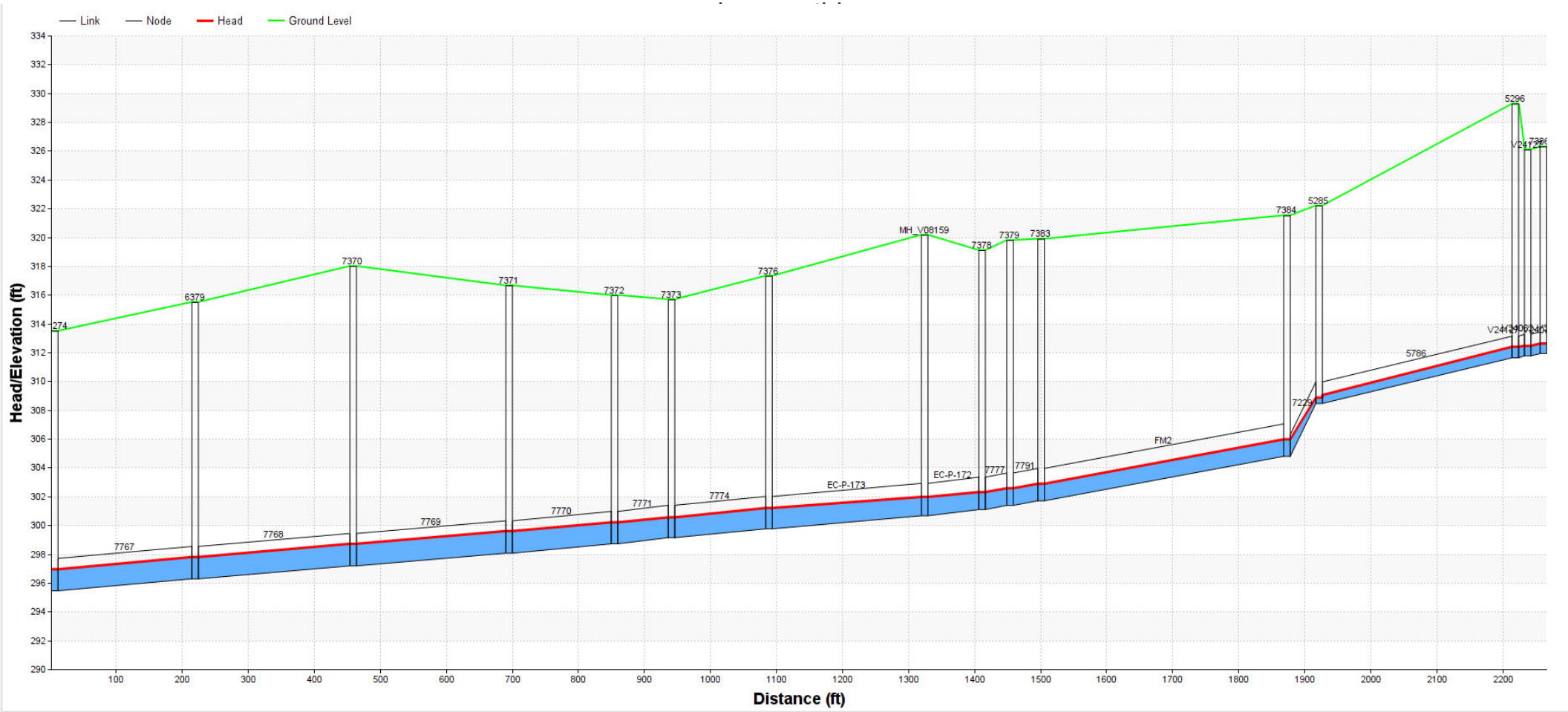


Sewer Line A – Buildout PWWF

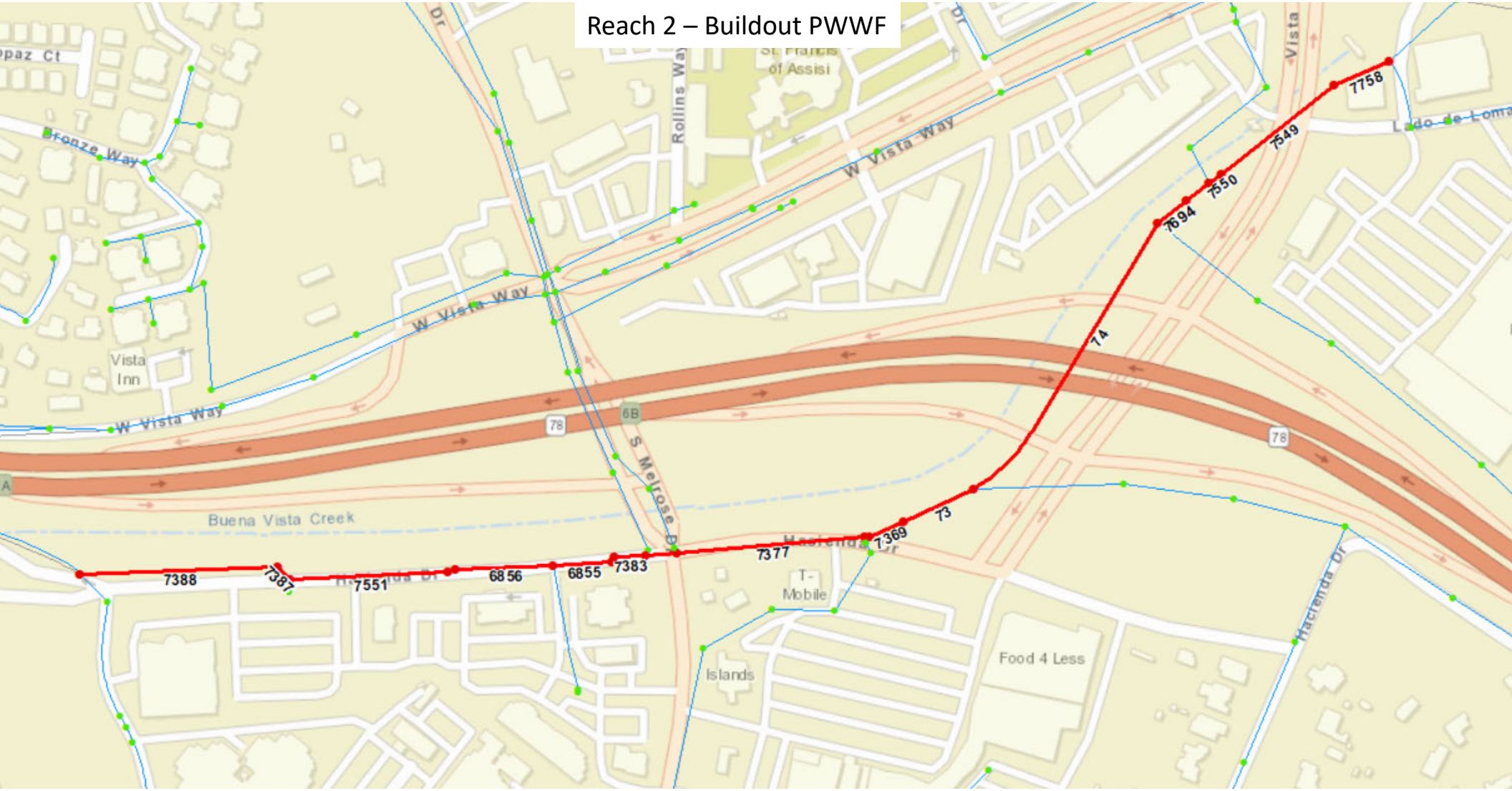
Sewer Line A – Buildout PWWF



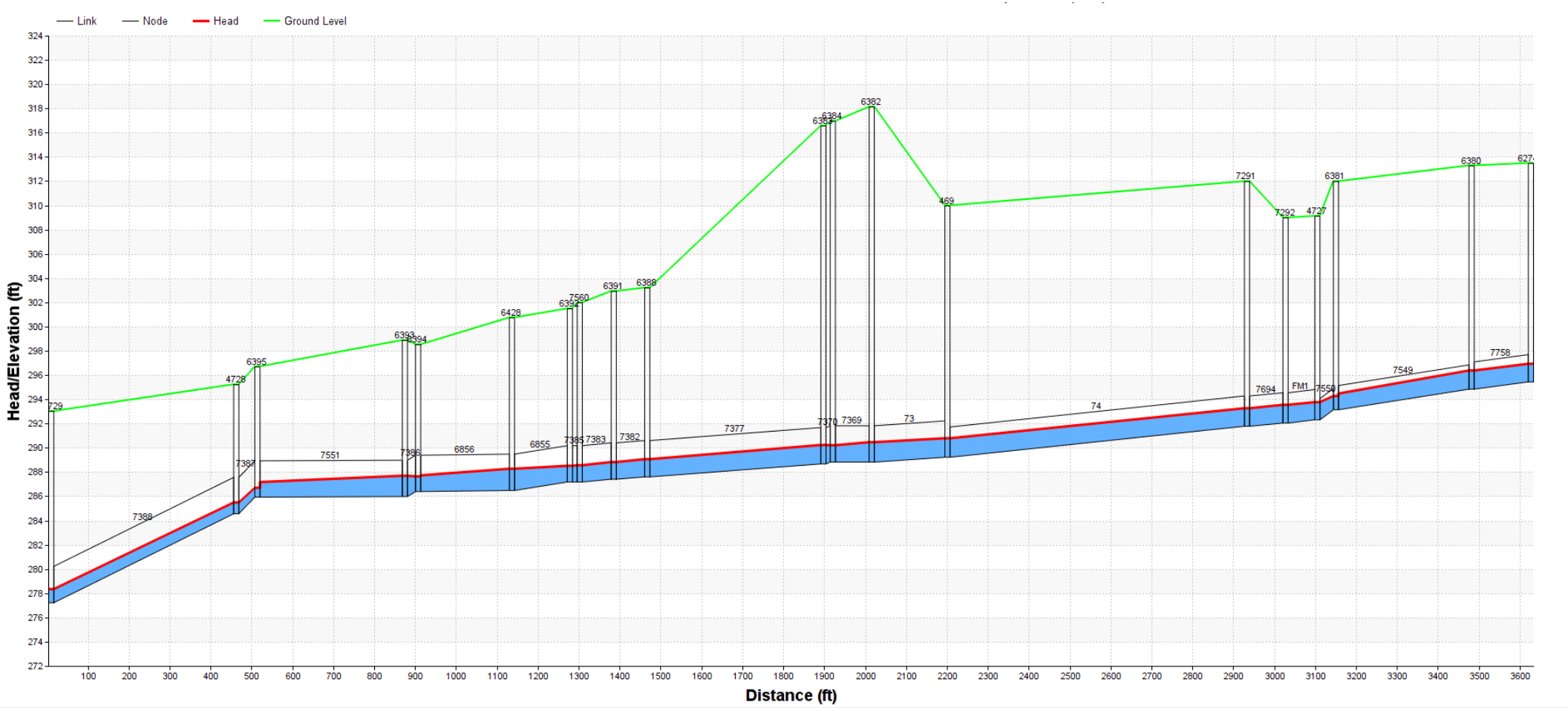

Reach 1 – Buildout PWWF
Vista Village Dr
BURGER KING
Fruttos Yogurt
AT&T
Wave Waterpark
Wave Waterpark
Buena Vista Creek
Buena Vista Creek
Santa Fe Ave
Veterans Memorial Park
FM2
7229
5786
7791
EC-P-172
EC-P-173
7774
7771
7770
7769
7768
7767
Eddie Dr
Peters Dr
Wave Dr
Lado de Loma Dr
Lado de Loma Dr

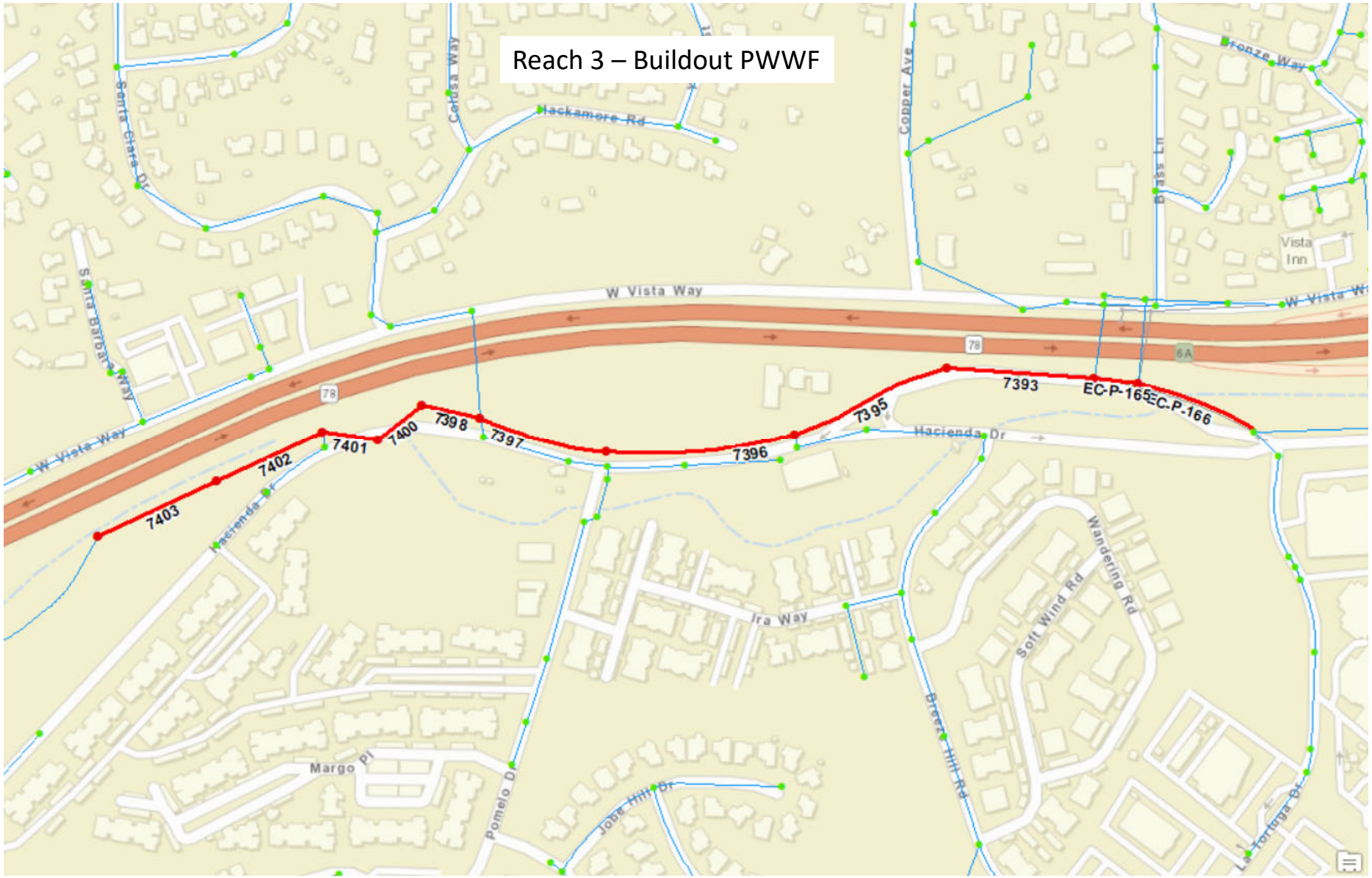

Link
Node
Head
Ground Level
Head/Elevation (ft)
Distance (ft)
334
332
330
328
326
324
322
320
318
316
314
312
310
308
306
304
302
300
298
296
294
292
290
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
274
6379
7370
7371
7372
7373
7376
MH_V08159
7378
7379
7383
7384
5285
5296
7767
7768
7769
7770
7771
7774
EC-P-173
EC-P-172
7777
7791
FM2
7229
5786

Reach 2 – Buildout PWWF

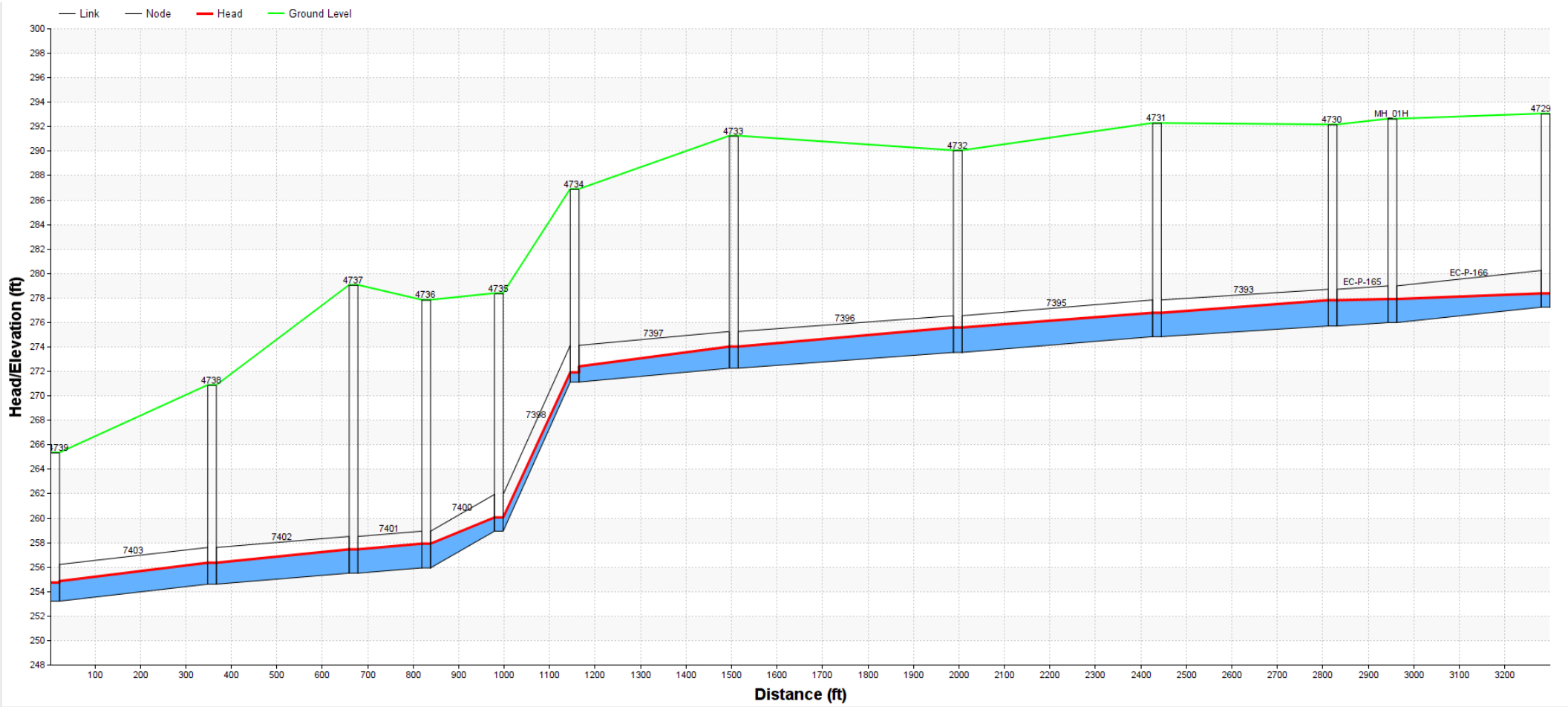


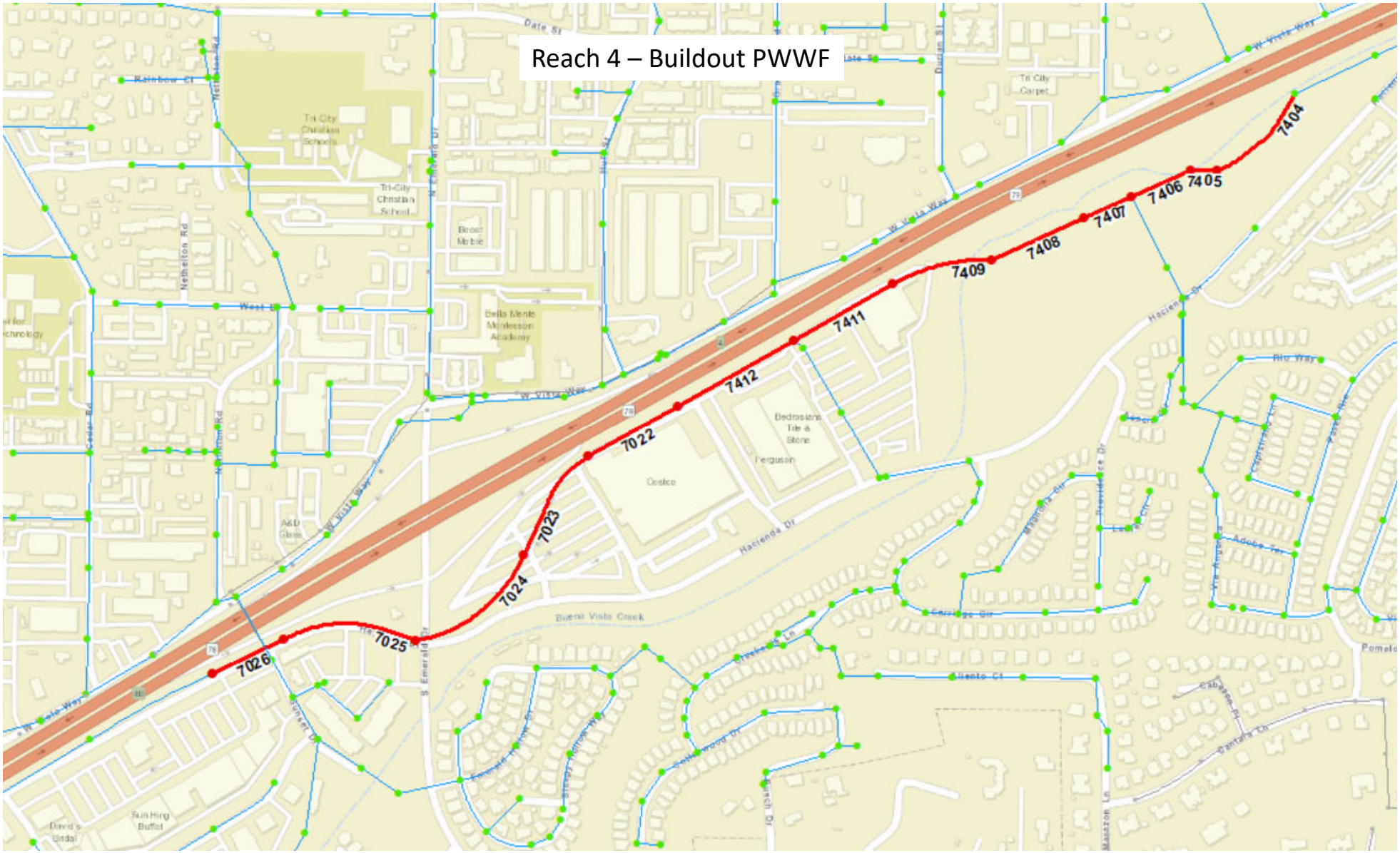
Reach 2 – Buildout PWWF



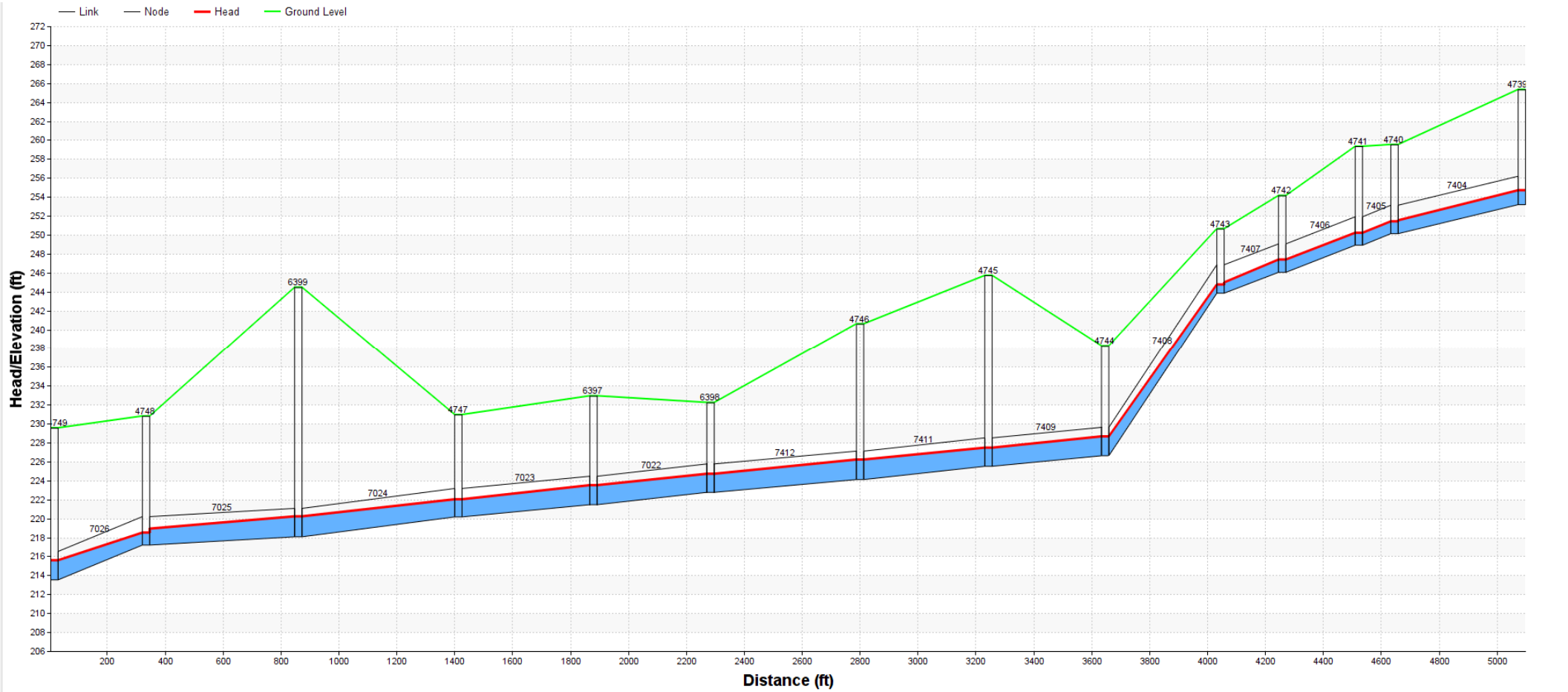

Reach 3 – Buildout PWWF
W Vista Way
Hackamore Rd
Santa Clara Dr
Celosa Way
Copper Ave
Bass Ln
Bronze Way
Vista Inn
Santa Barbara Way
78
6A
7403
7402
7401
7400
7398
7397
7396
7395
7393
EC-P-165
EC-P-166
Hacienda Dr
Ira Way
Soft Wind Rd
Wandering Rd
Breeze Hill Rd
Margo Pl
Pomelo Dr
Jobe Hill Dr
La Tortuga Dr

Reach 3 – Buildout PWWF

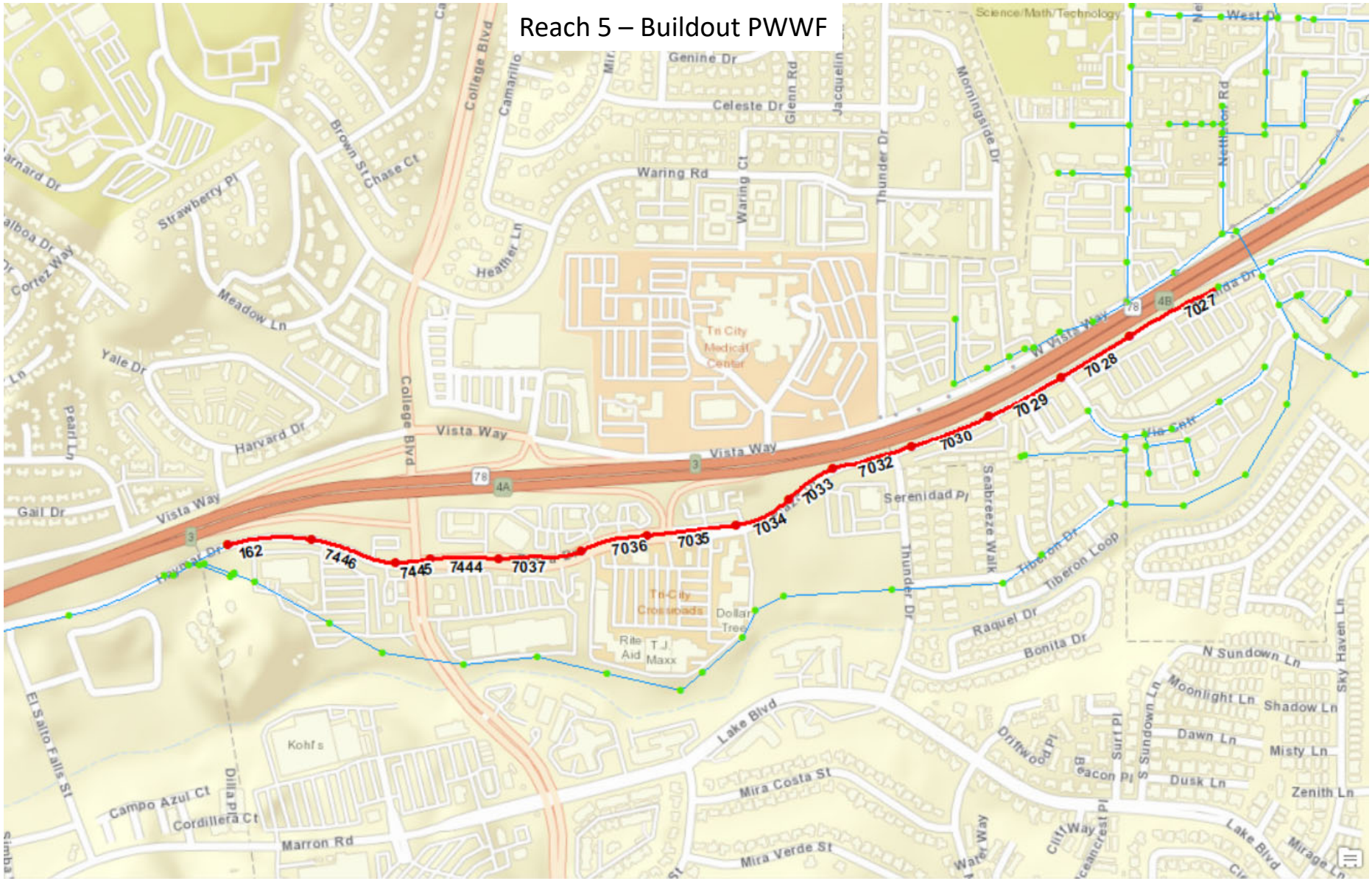



Reach 4 – Buildout PWWF
7404
7405
7406
7407
7408
7409
7411
7412
7022
7023
7024
7025
7026
Costco
Bedrosians Tile & Stone
Ferguson
Bella Mente Montessori Academy
Tri-City Christian Schools
Buena Vista Creek
Hacienda Dr
W Vista Way
Rainbow Ct
Nettleton Rd
S Emerald Dr
Date St
Durum St
Tri City Carpet
Boost Mobile
West Ln
Cedar Rd
Rio Way
Sunset Dr
Sun Hing Buffet
David's Bridal

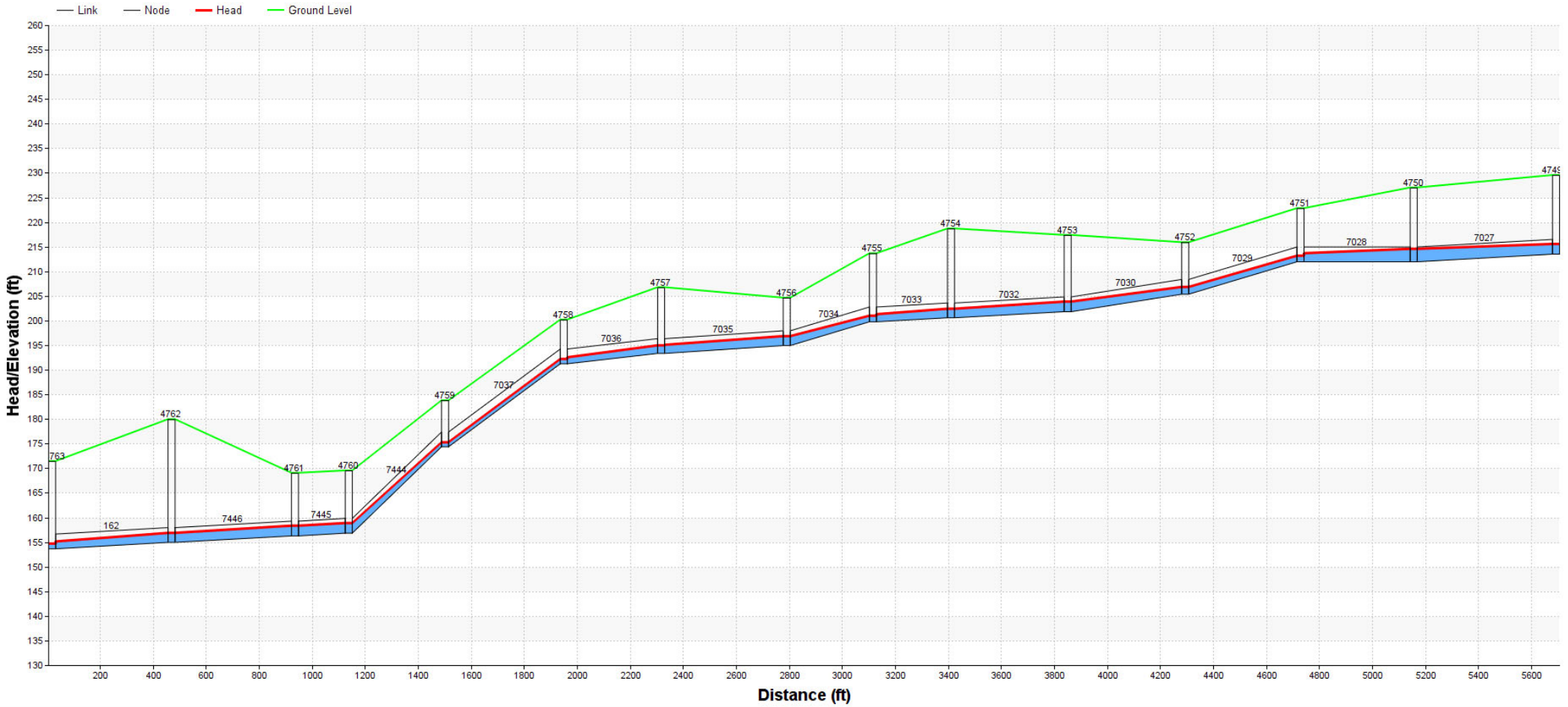
Reach 4 – Buildout PWWF



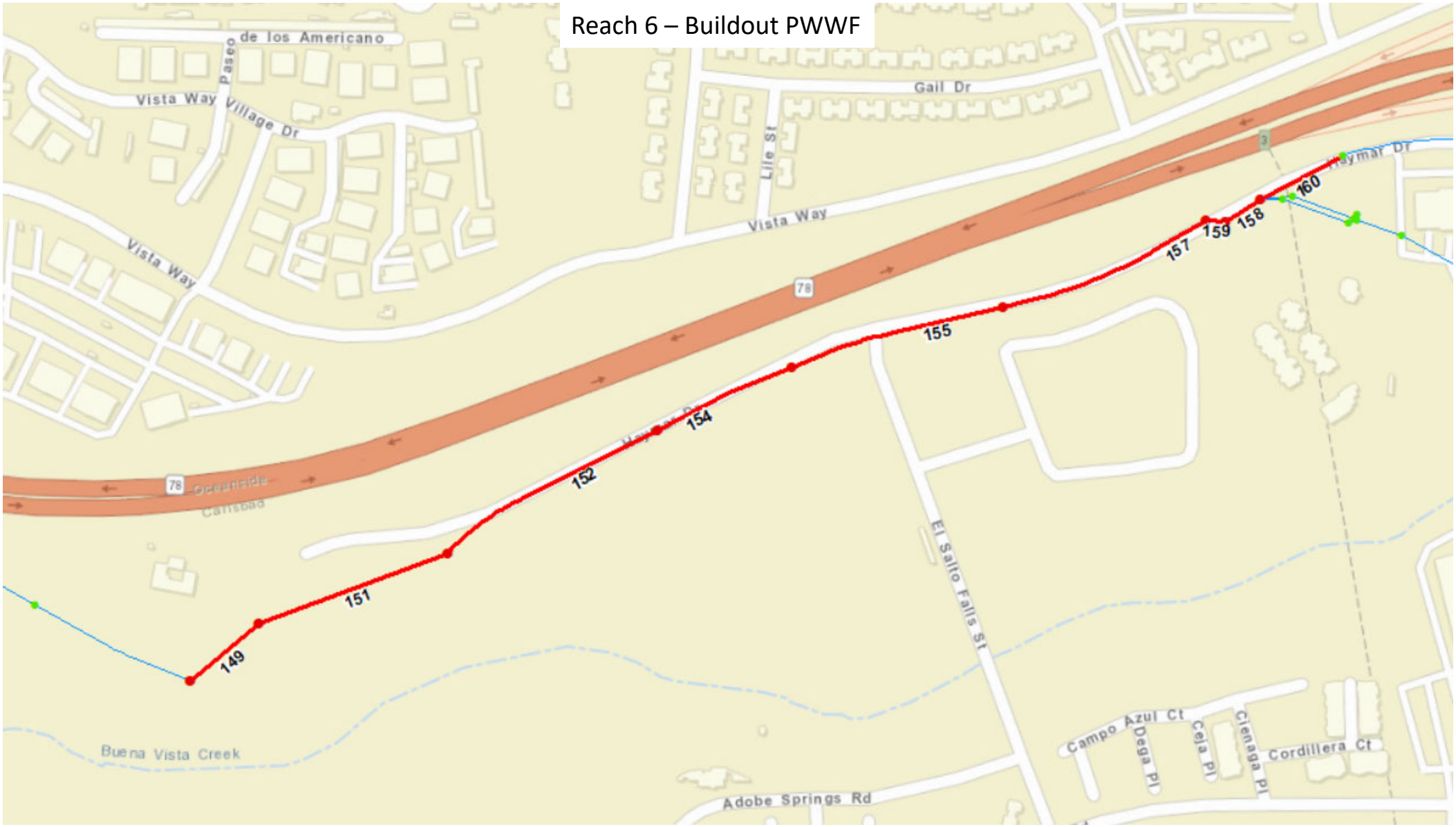
Reach 5 – Buildout PWWF



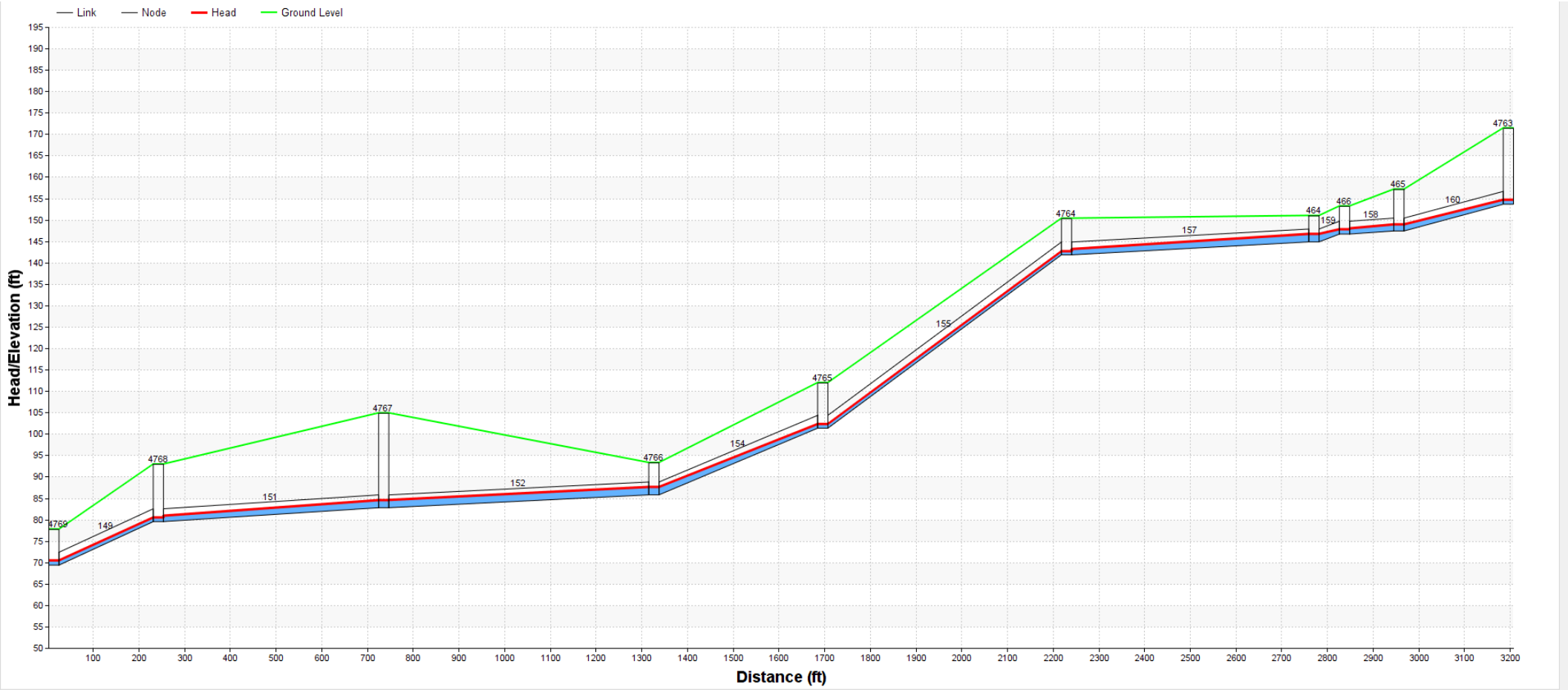
Reach 5 – Buildout PWWF

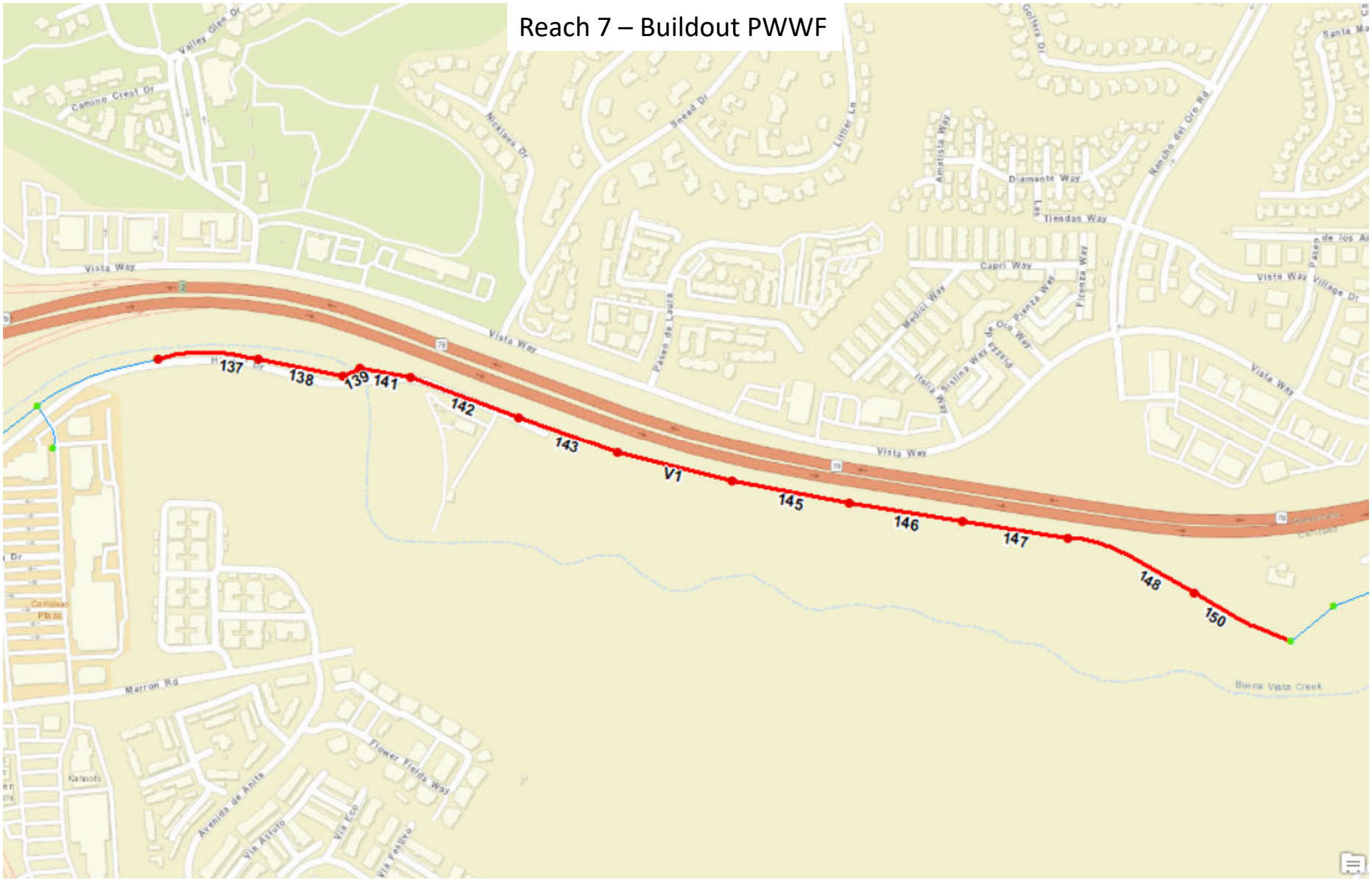


Reach 6 – Buildout PWWF

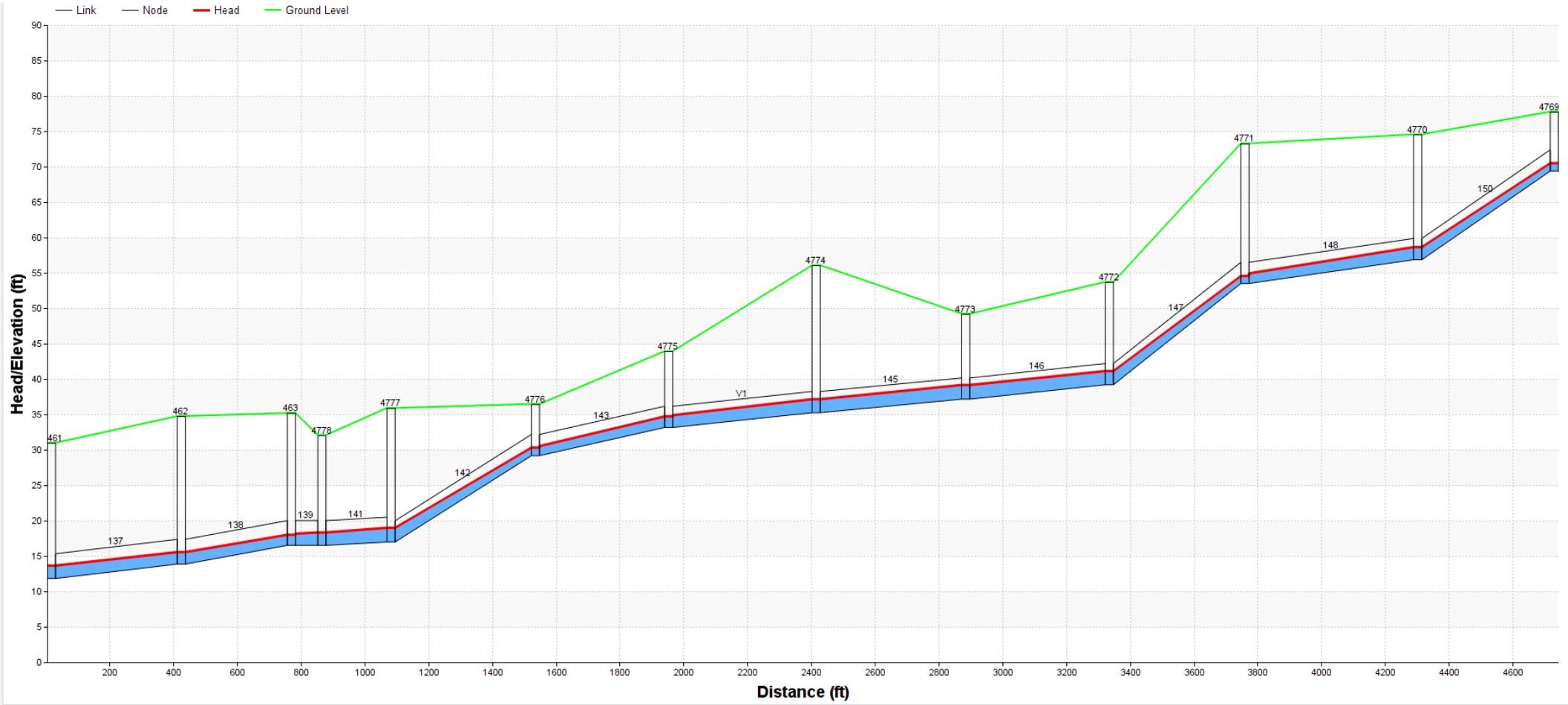


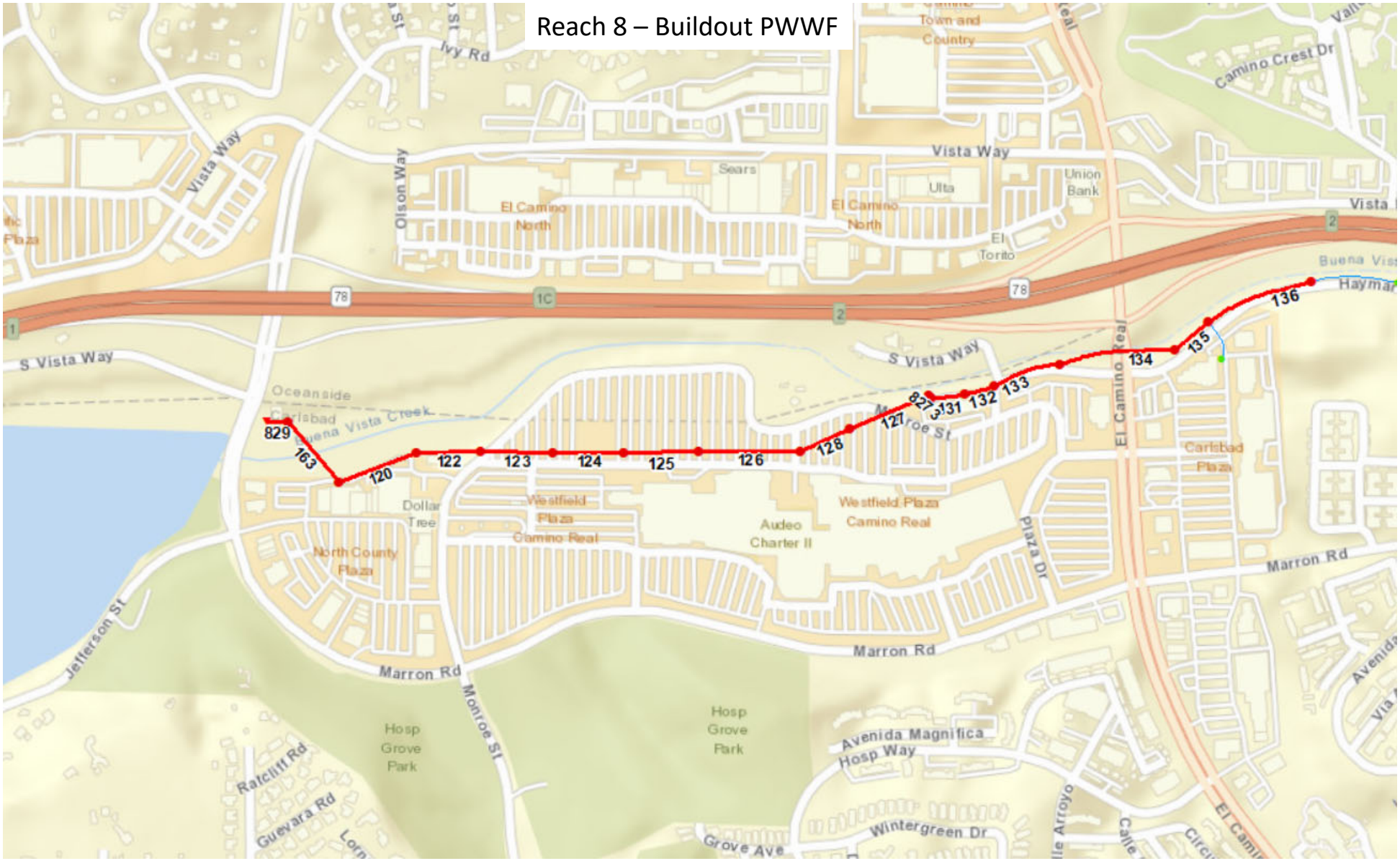
Reach 6 – Buildout PWWF



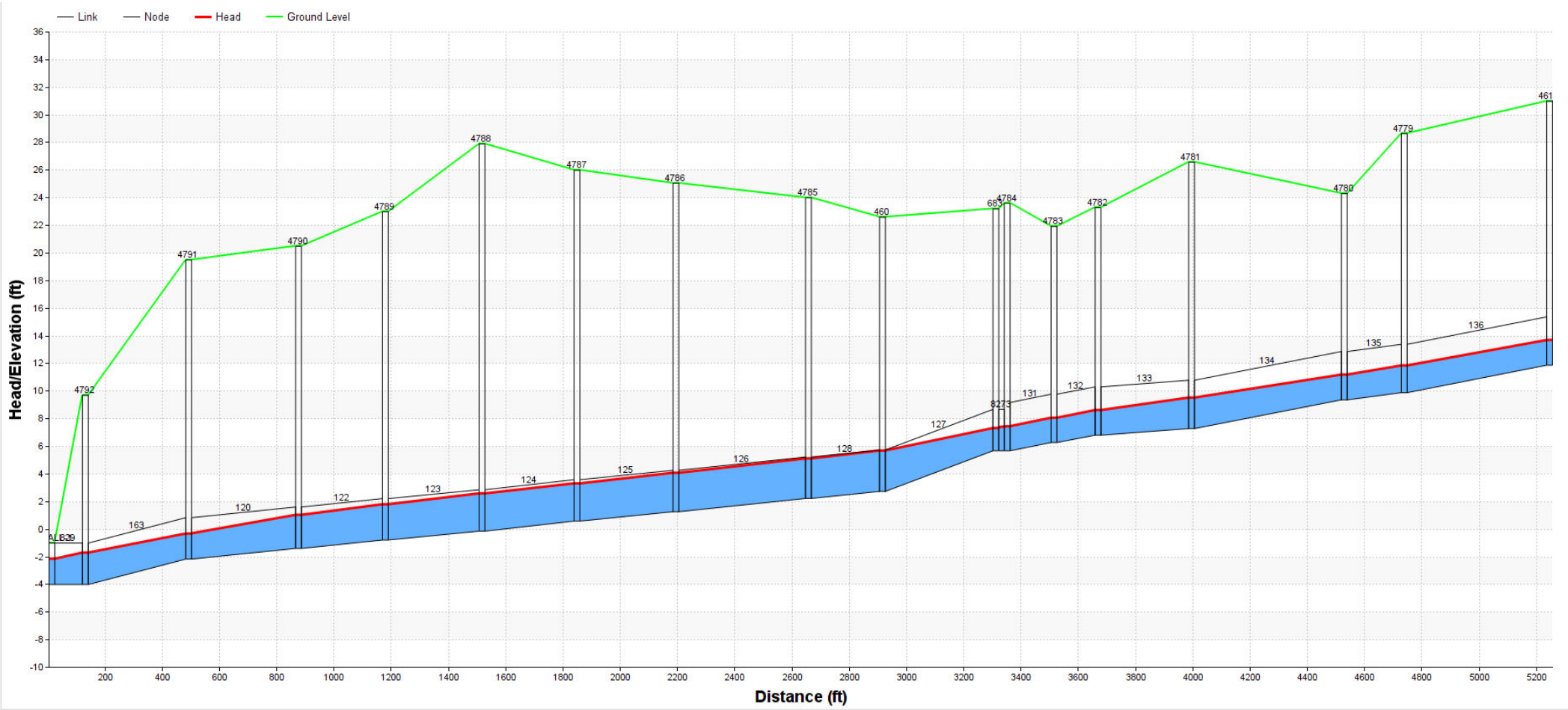

Reach 7 – Buildout PWWF
137
138
139
141
142
143
V1
145
146
147
148
150
Vista Way
Camino Crest Dr
Valley Glen Dr
Nicolaus Dr
Bread Dr
Littler Ln
Diamante Way
Las Tiendas Way
Capri Way
Medici Way
Firenza Way
Piazza Way
Via Sistina Way
Paseo de Laura
Rancho del Oro Rd
Vista Way Village Dr
Marron Rd
Flower Fields Way
Avenida de Anita
Via Arriulo
Via Eco
Via Festiva
Buena Vista Creek

Reach 7 – Buildout PWWF




Reach 8 – Buildout PWWF
829
163
120
122
123
124
125
126
128
127
131
132
133
134
135
136
Ivy Rd
Vista Way
Olson Way
Sears
El Camino North
Ulta
Union Bank
El Torito
Town and Country
Camino Crest Dr
78
1C
2
S Vista Way
Oceanside
Carlsbad
Buena Vista Creek
Monroe St
El Camino Real
Carlsbad Plaza
Dollar Tree
Westfield Plaza Camino Real
North County Plaza
Audeo Charter II
Plaza Dr
Marron Rd
Jefferson St
Hosp Grove Park
Ratcliff Rd
Guevara Rd
Avenida Magnifica
Hosp Way
Wintergreen Dr
Grove Ave

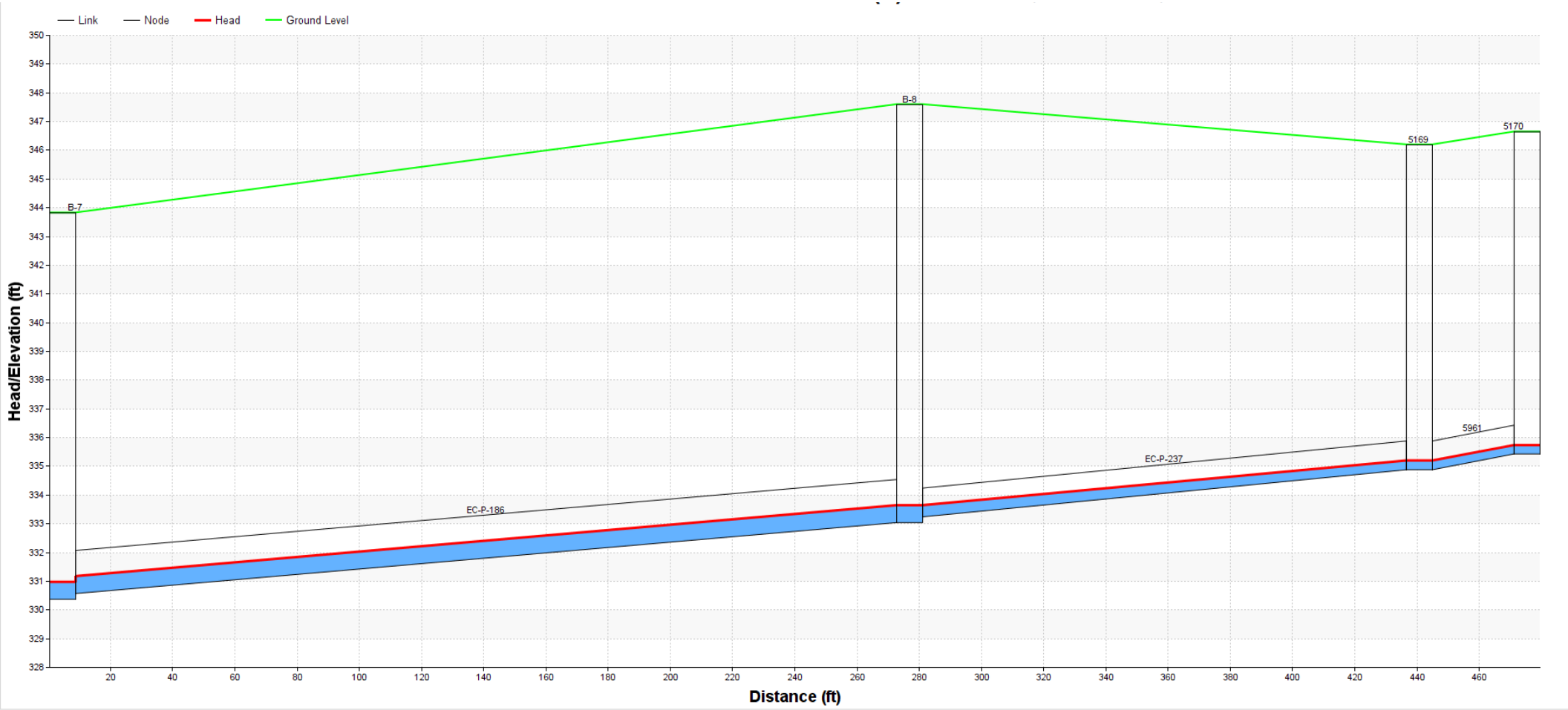
Reach 8 – Buildout PWWF



Appendix F
Buildout System with CIP Upgrades
+Development Flows
Peak Wet Weather Flow HGL Profiles

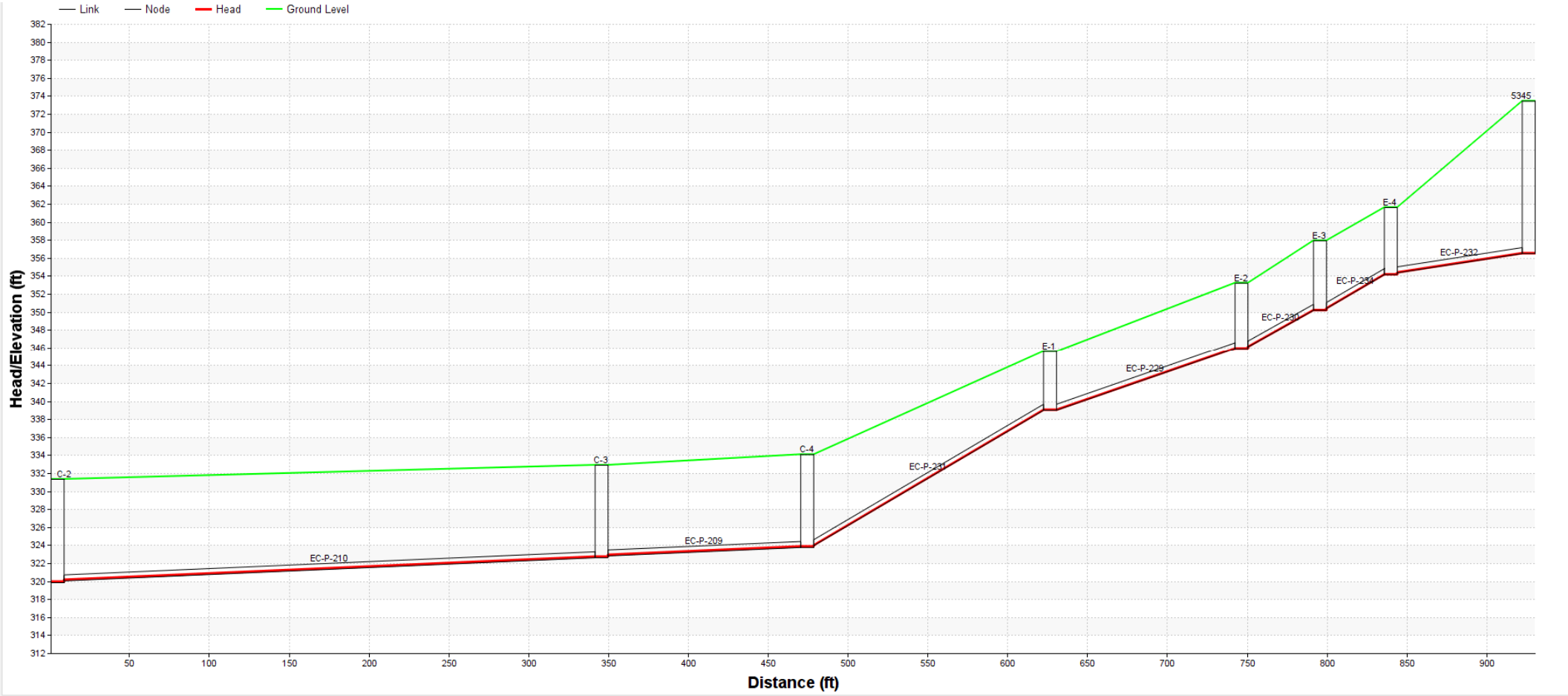
Sewer Line F – Buildout PWWF

Sewer Line F – Buildout PWWF



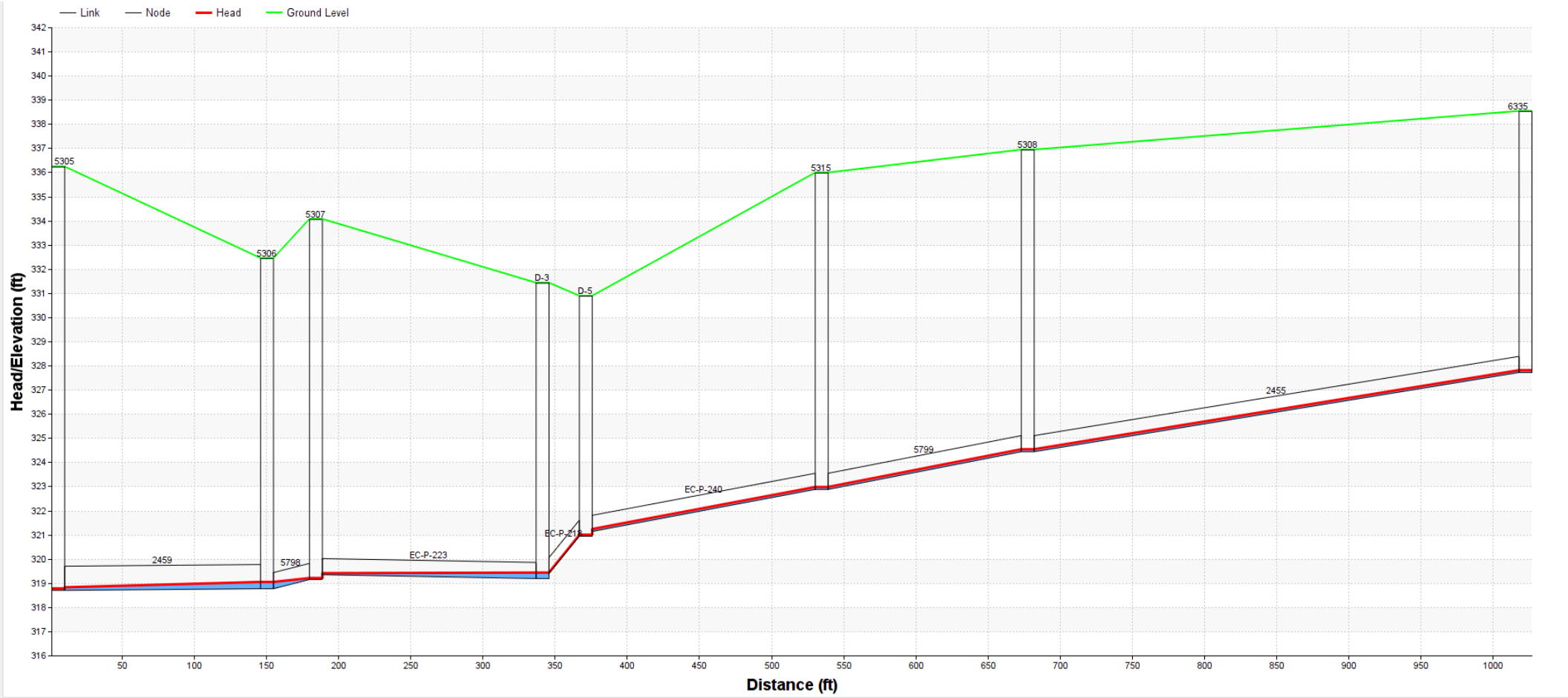

Sewer Line E – Buildout PWWF
S Santa Fe Ave
EC-P-210
EC-P-209
EC-P-231
EC-P-229
EC-P-230
EC-P-234
EC-P-232
Terrace Dr
101
501
531

Sewer Line E – Buildout PWWF



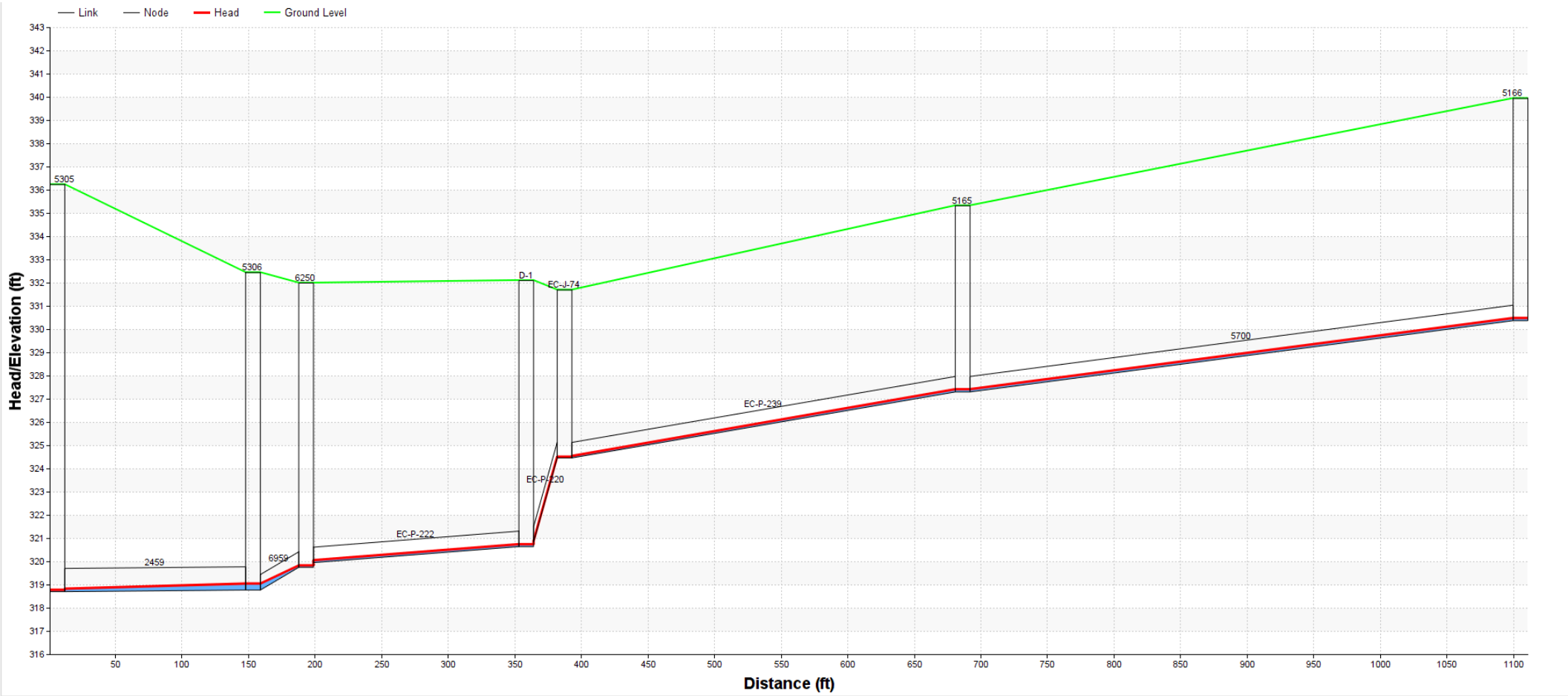
Sewer Line D 3 – Buildout PWWF

Sewer Line D 3 – Buildout PWWF



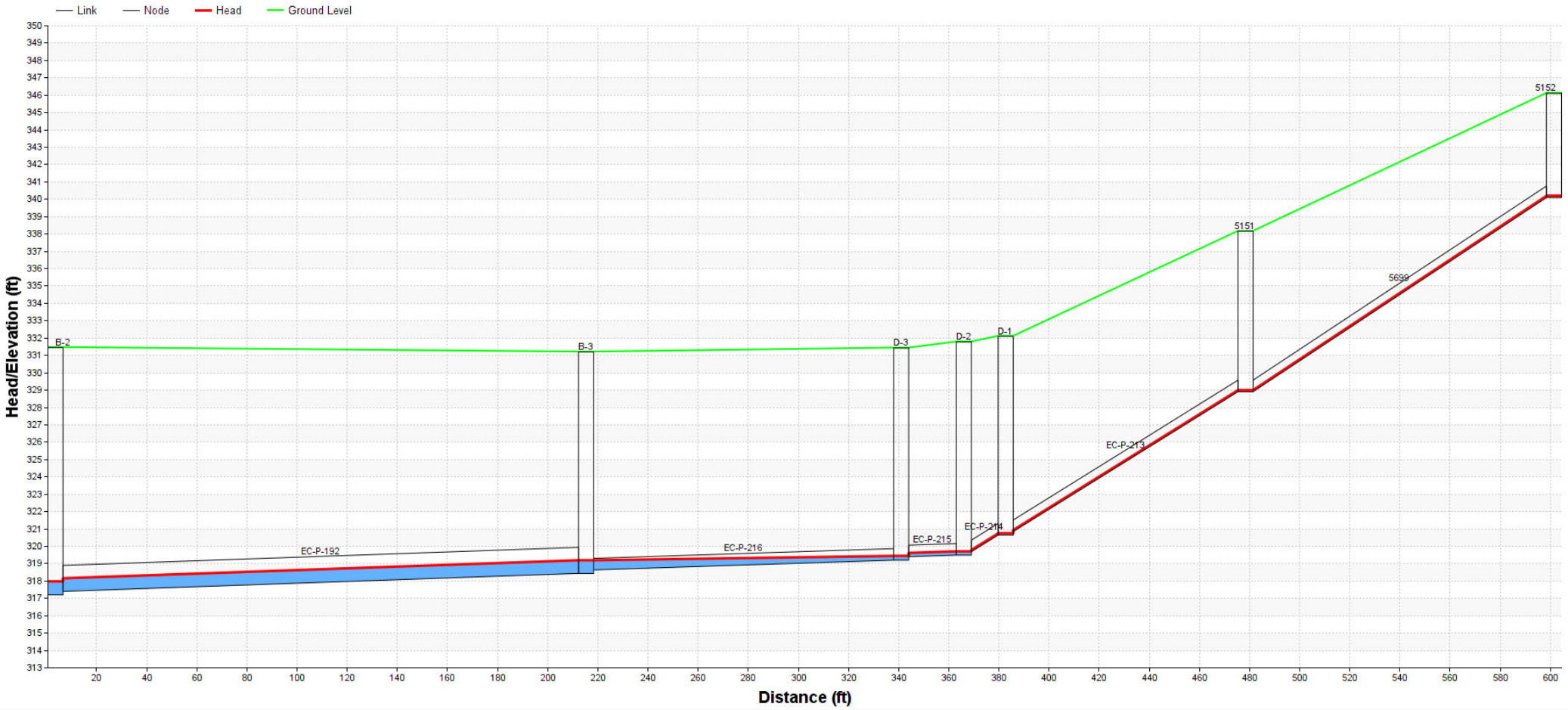
Sewer Line D 2 – Buildout PWWF

Sewer Line D 2 – Buildout PWWF

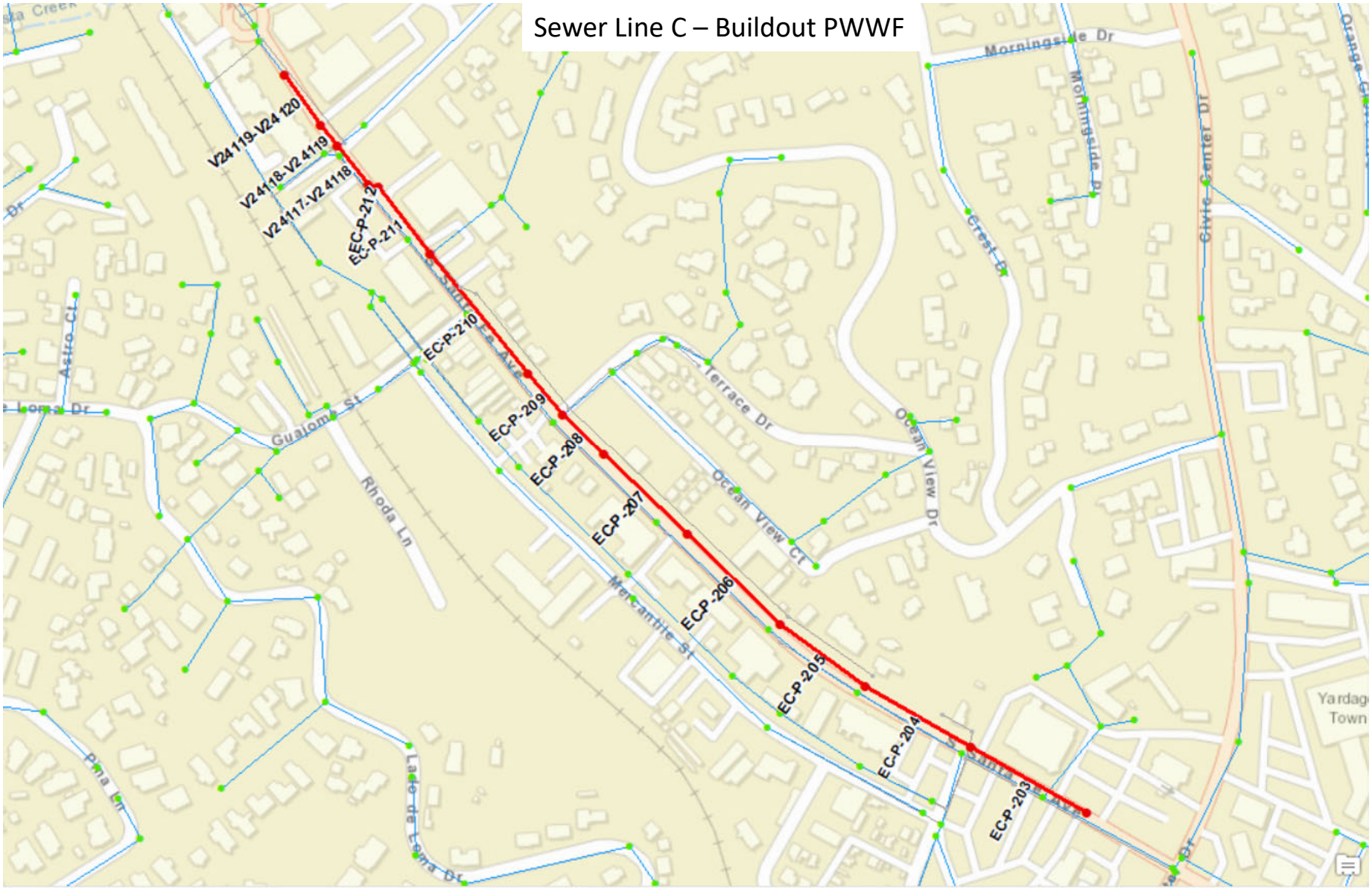



Sewer Line D – Buildout PWWF
EC-P-192
S Santa Fe Ave
EC-P-216
EC-P-215
EC-P-213
5699
Guajome St
Sprinter
Terrace Dr
Junction with Kenosha Development Flow Loading

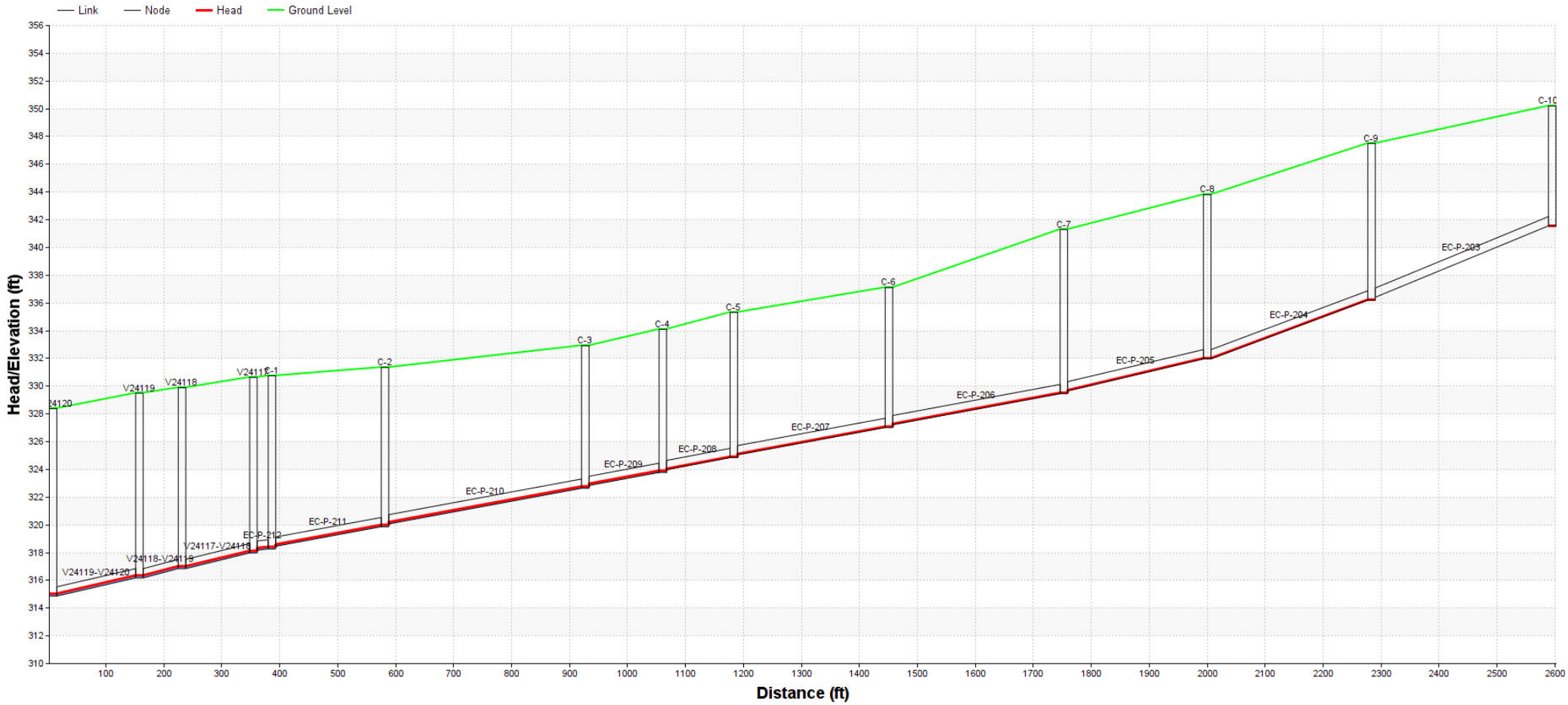
Sewer Line D – Buildout PWWF



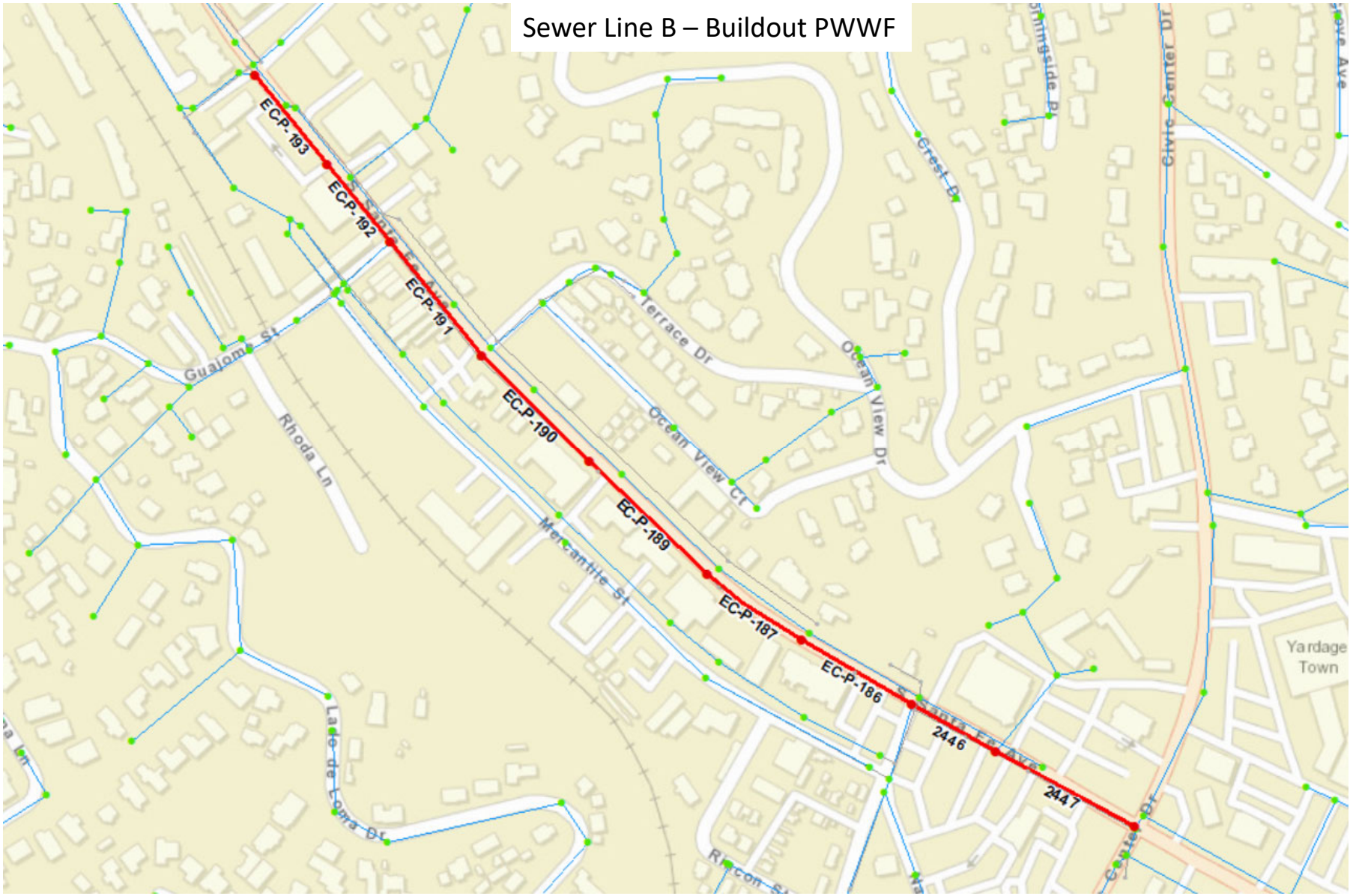
Sewer Line C – Buildout PWWF



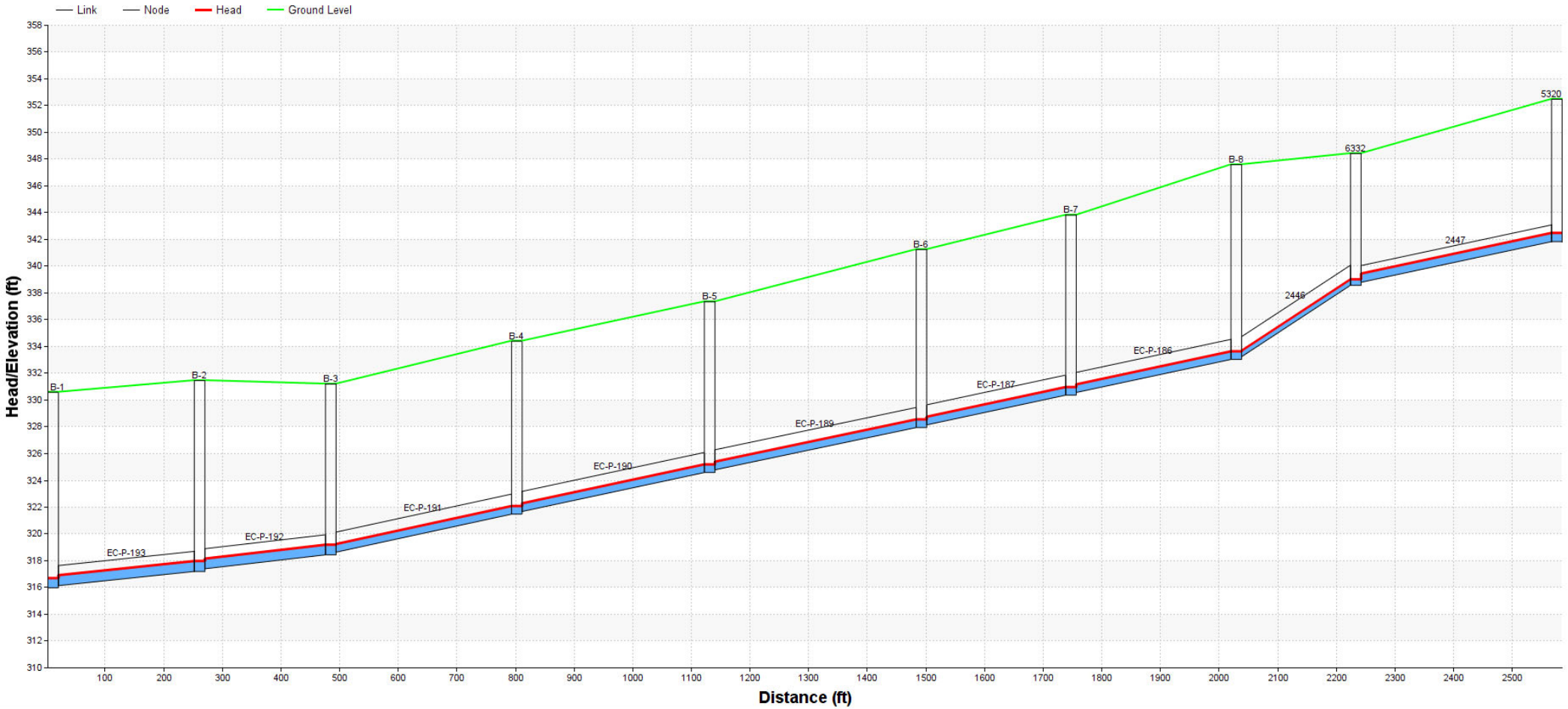
Sewer Line C – Buildout PWWF



Sewer Line B – Buildout PWWF

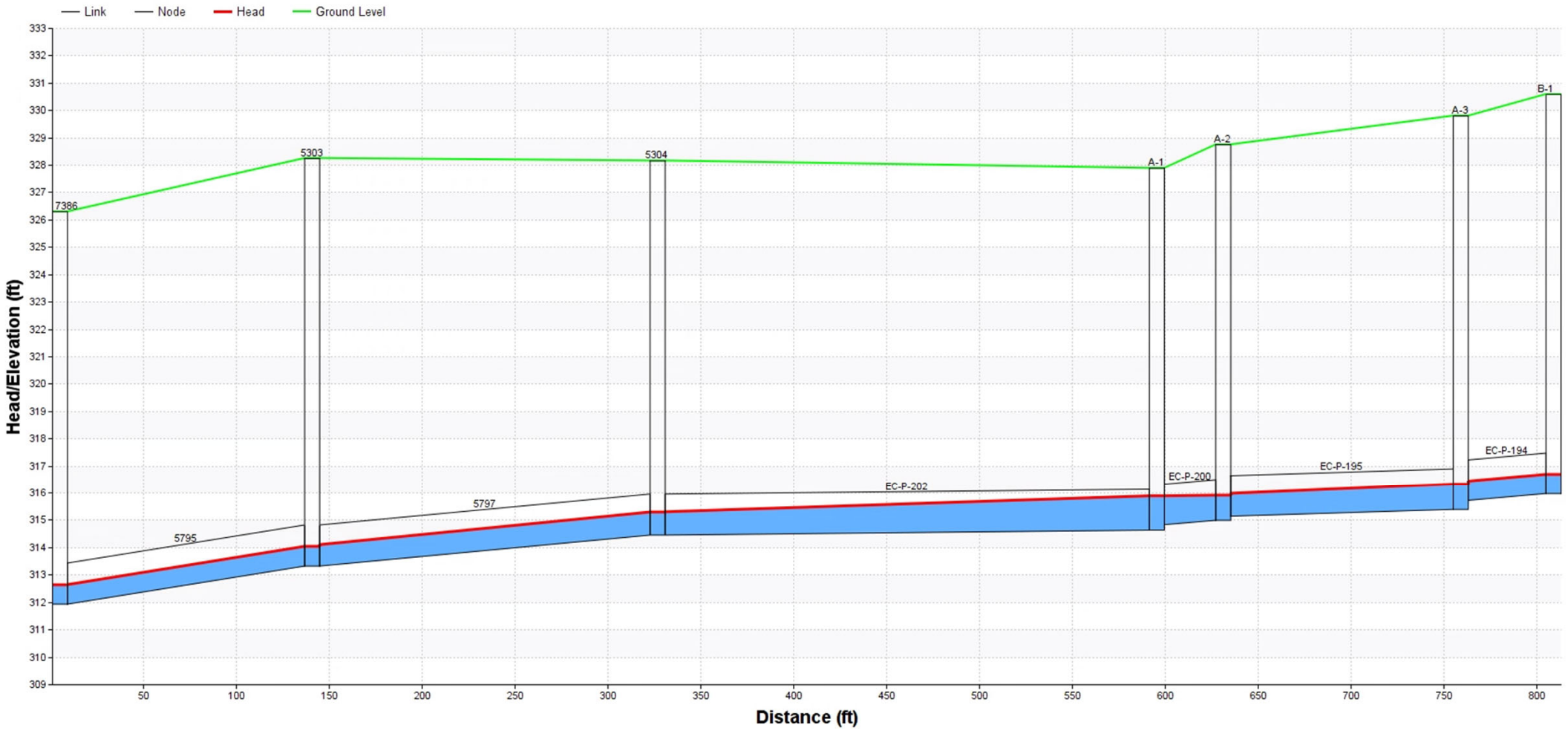


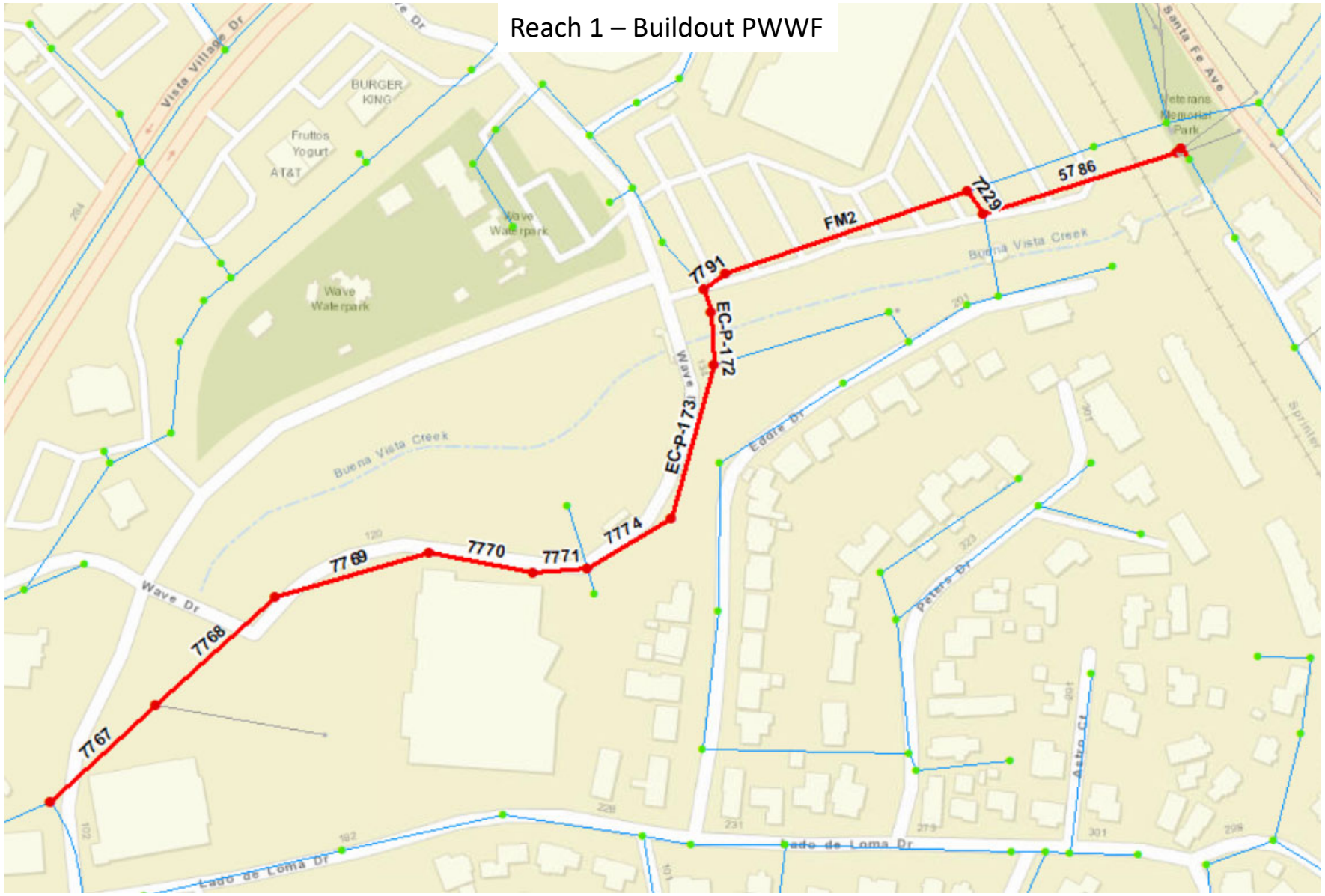
Sewer Line B – Buildout PWWF



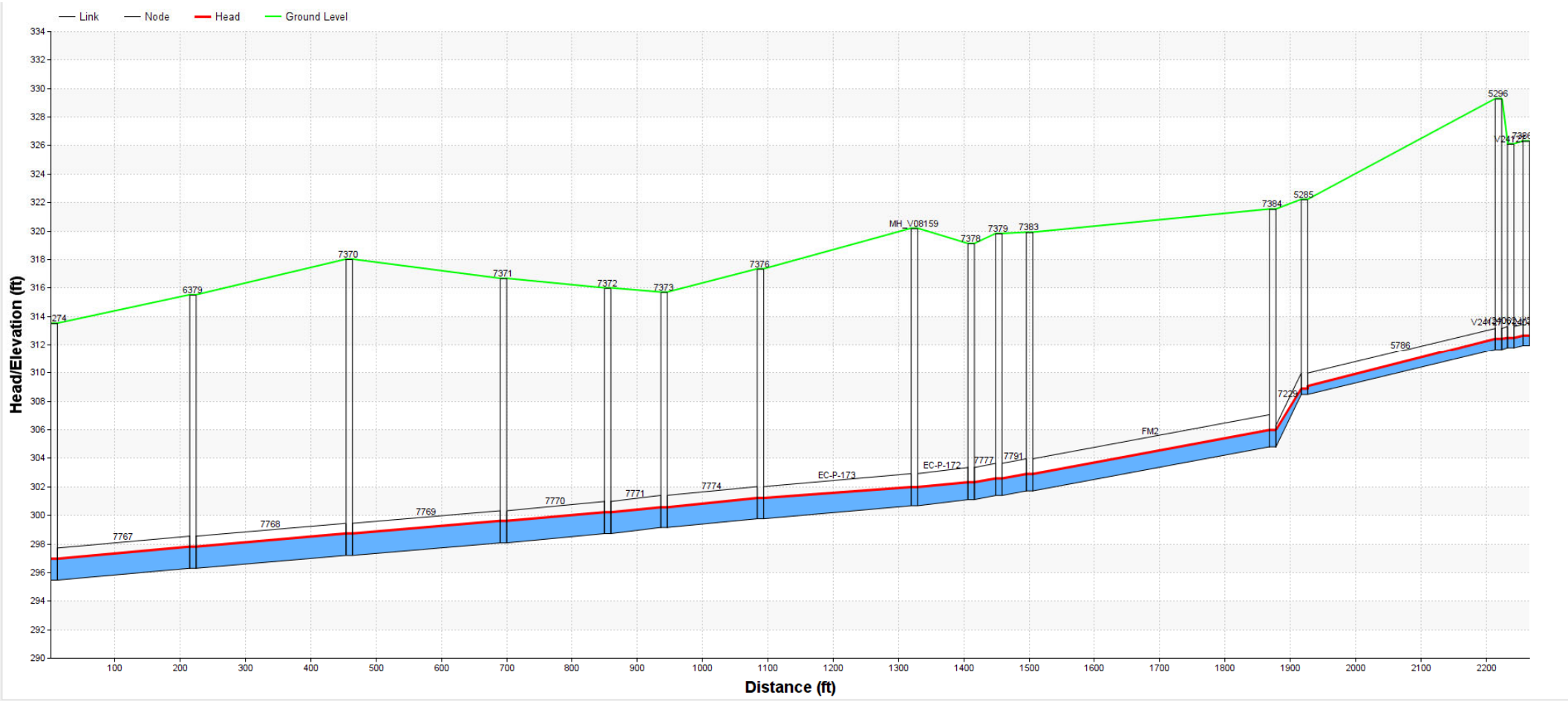
Sewer Line A – Buildout PWWF

Sewer Line A – Buildout PWWF

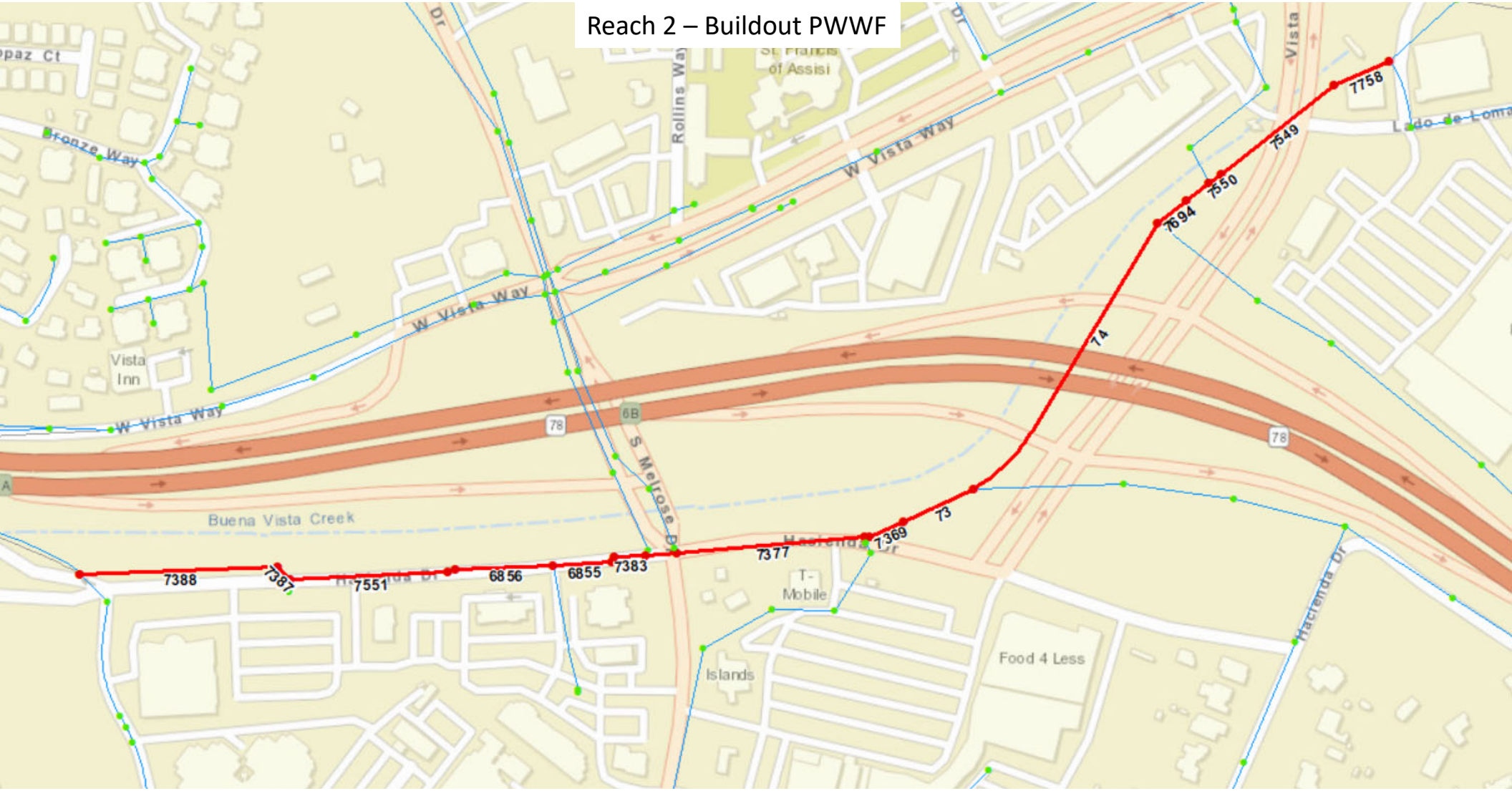



Reach 1 – Buildout PWWF
Vista Village Dr
BURGER KING
Fruttos Yogurt
AT&T
Wave Waterpark
Wave Waterpark
Buena Vista Creek
Buena Vista Creek
Santa Fe Ave
Veterans Memorial Park
FM2
7229
5786
7791
EC-P-172
EC-P-173
7774
7771
7770
7769
7768
7767
Eddie Dr
Peters Dr
Wave Dr
Lado de Loma Dr
Lado de Loma Dr

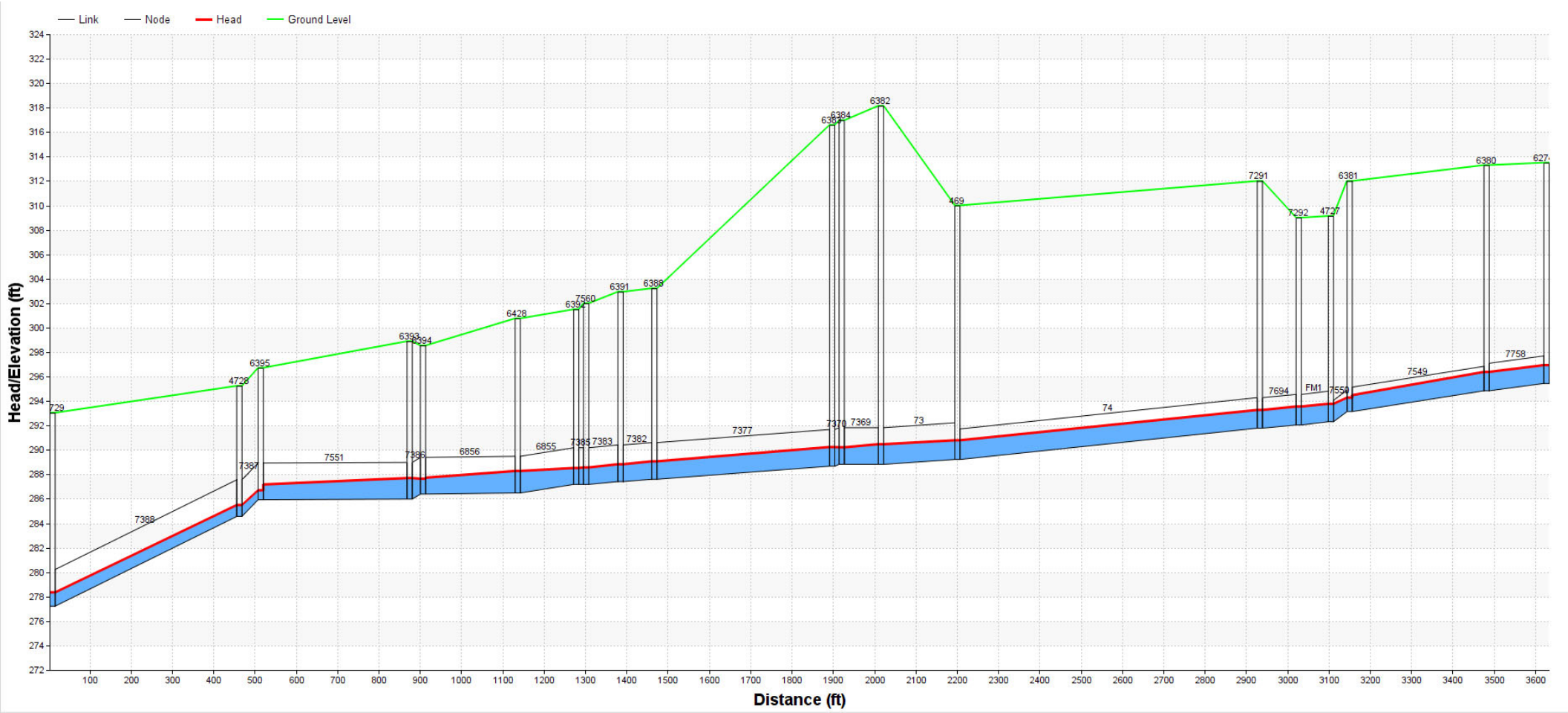
Reach 1 – Buildout PWWF

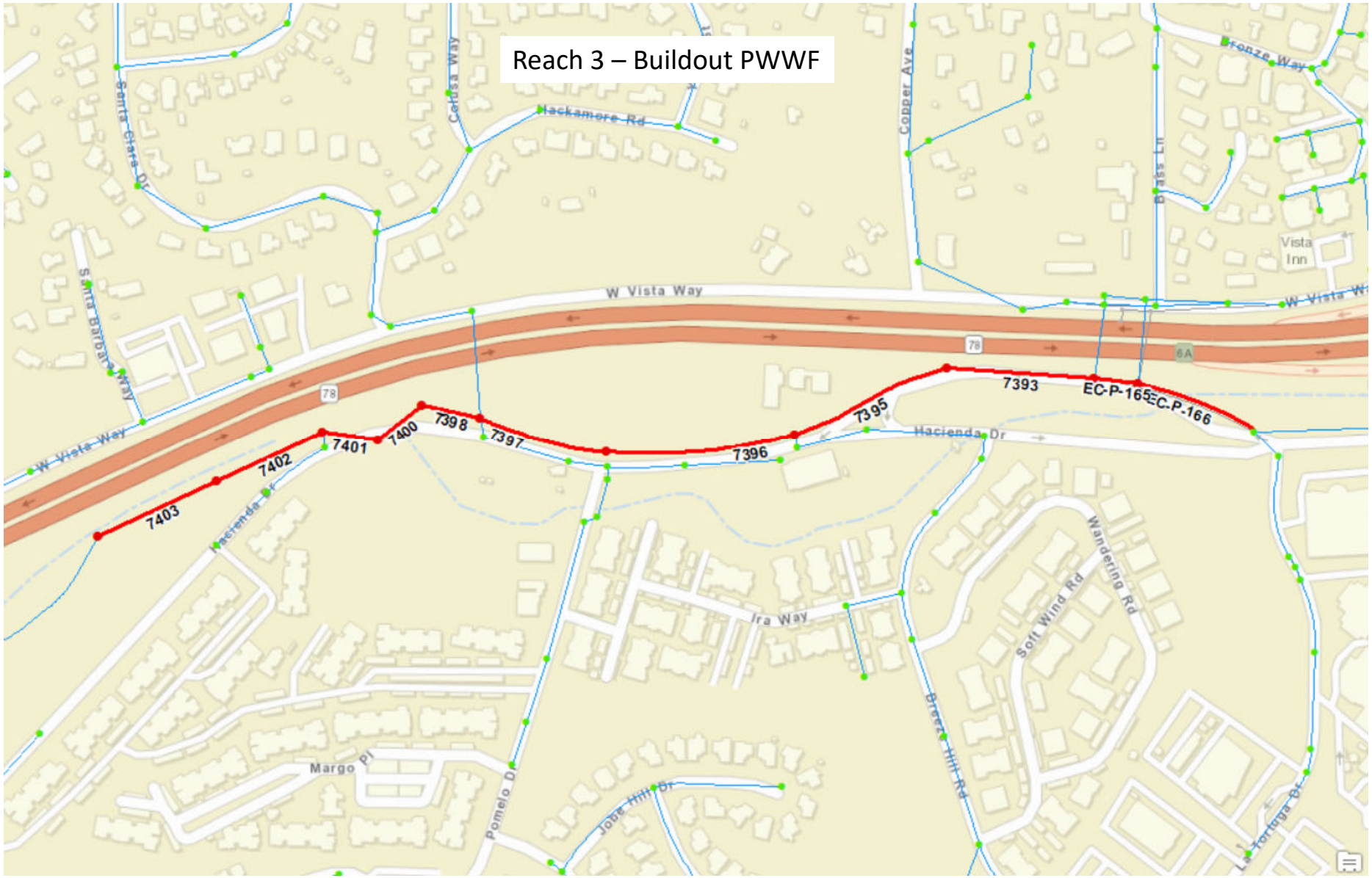


Reach 2 – Buildout PWWF

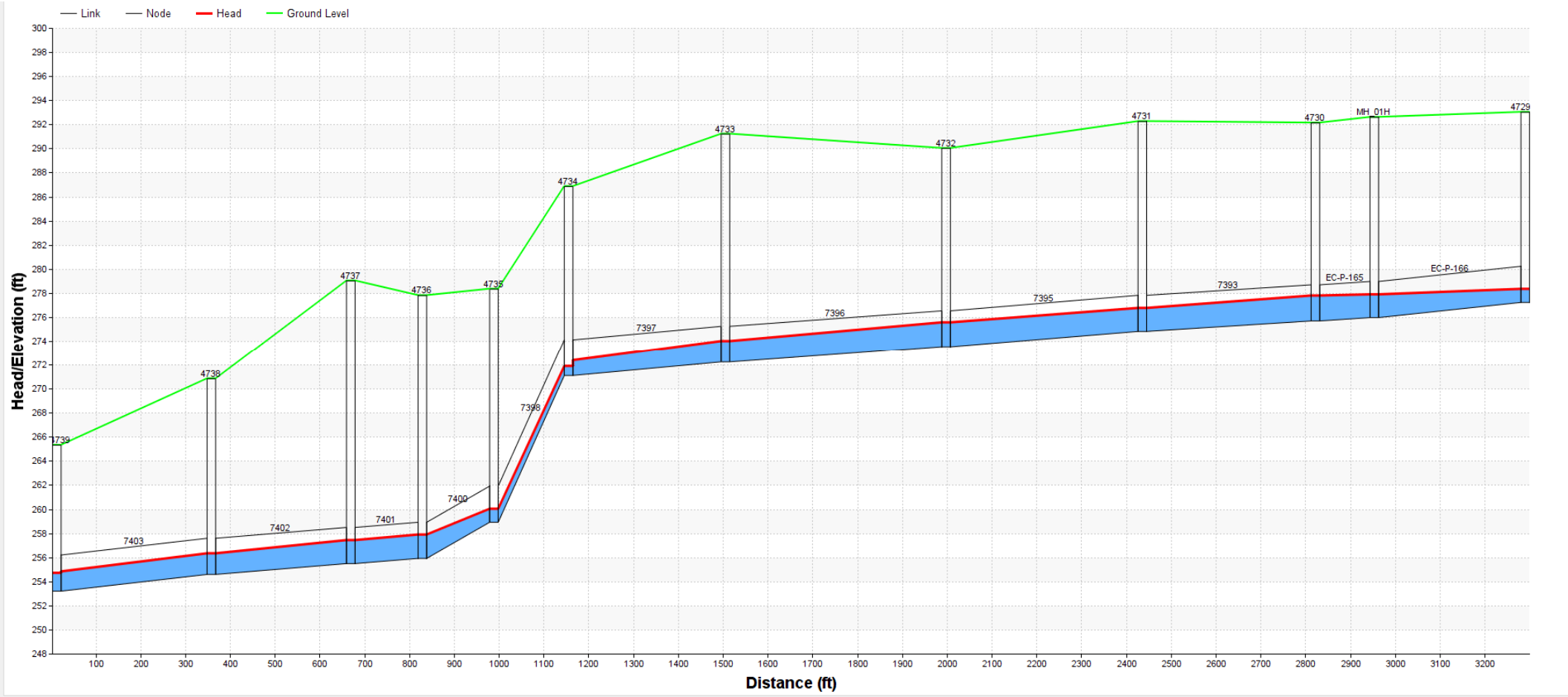


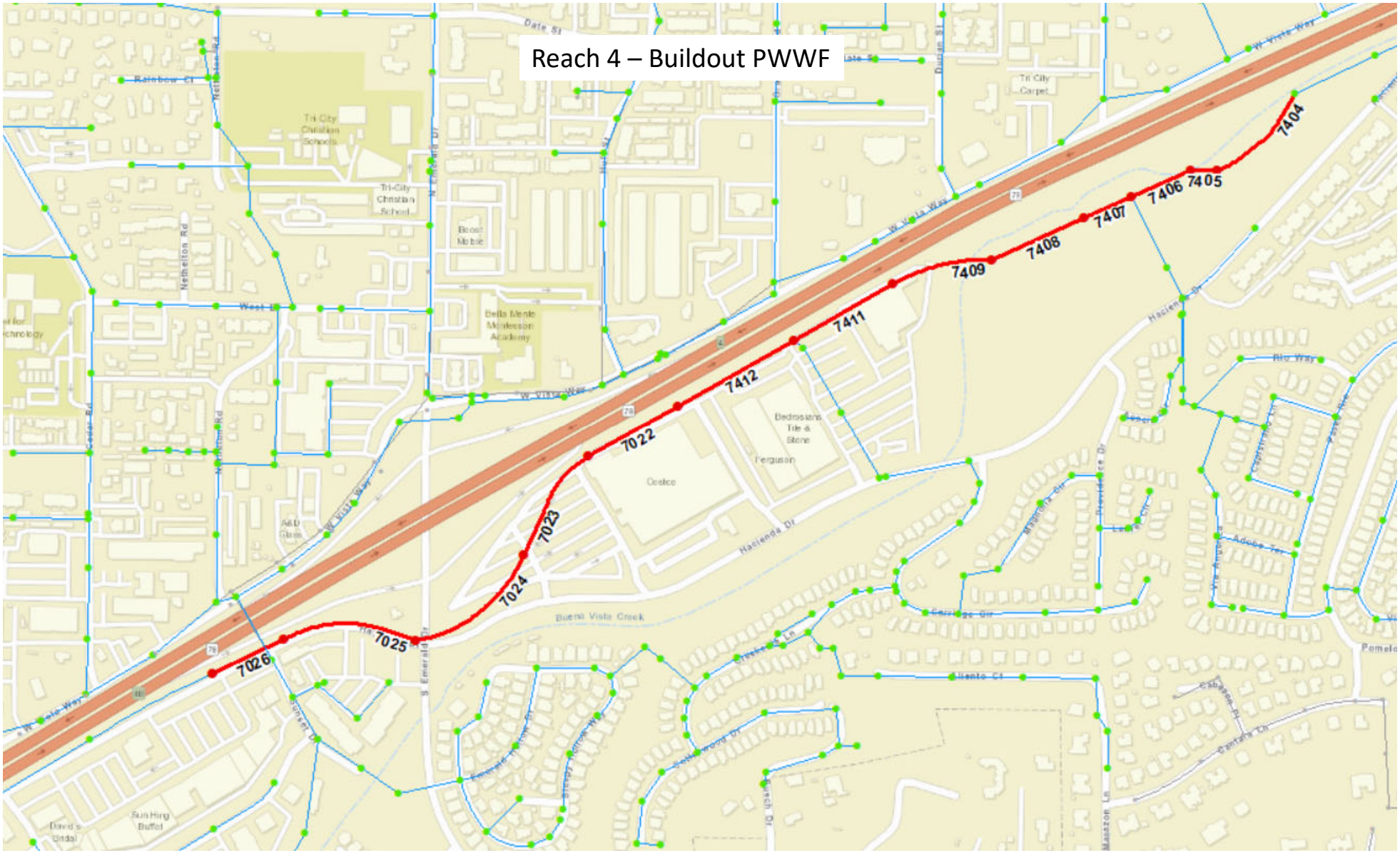
Reach 2 – Buildout PWWF



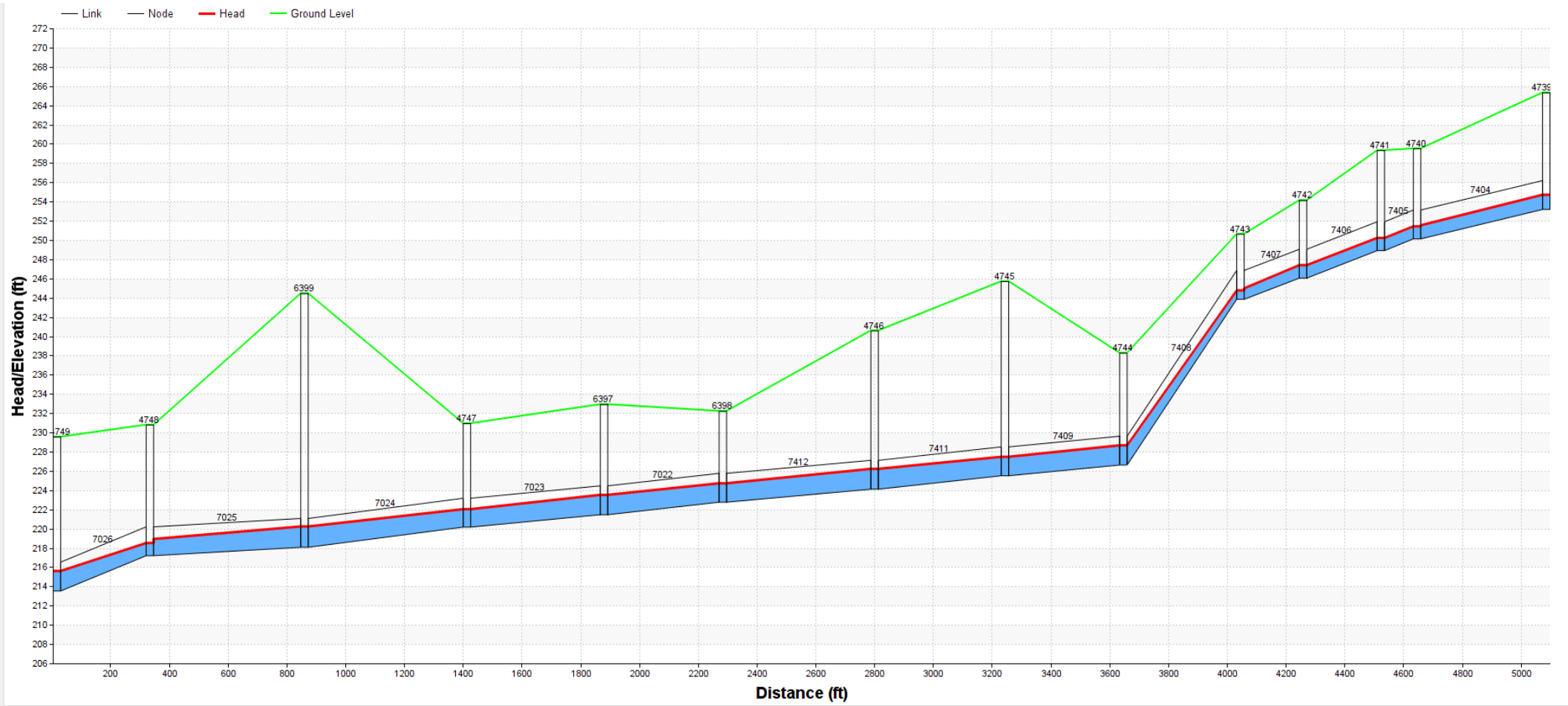

Reach 3 – Buildout PWWF
W Vista Way
Hackamore Rd
Santa Clara Dr
Celosa Way
Copper Ave
Bass Ln
Bronze Way
Vista Inn
Santa Barbara Way
78
6A
7403
7402
7401
7400
7398
7397
7396
7395
7393
EC-P-165
EC-P-166
Hacienda Dr
Ira Way
Soft Wind Rd
Wandering Rd
Breeze Hill Rd
Margo Pl
Pomelo Dr
Jobe Hill Dr
La Tortuga Dr

Reach 3 – Buildout PWWF

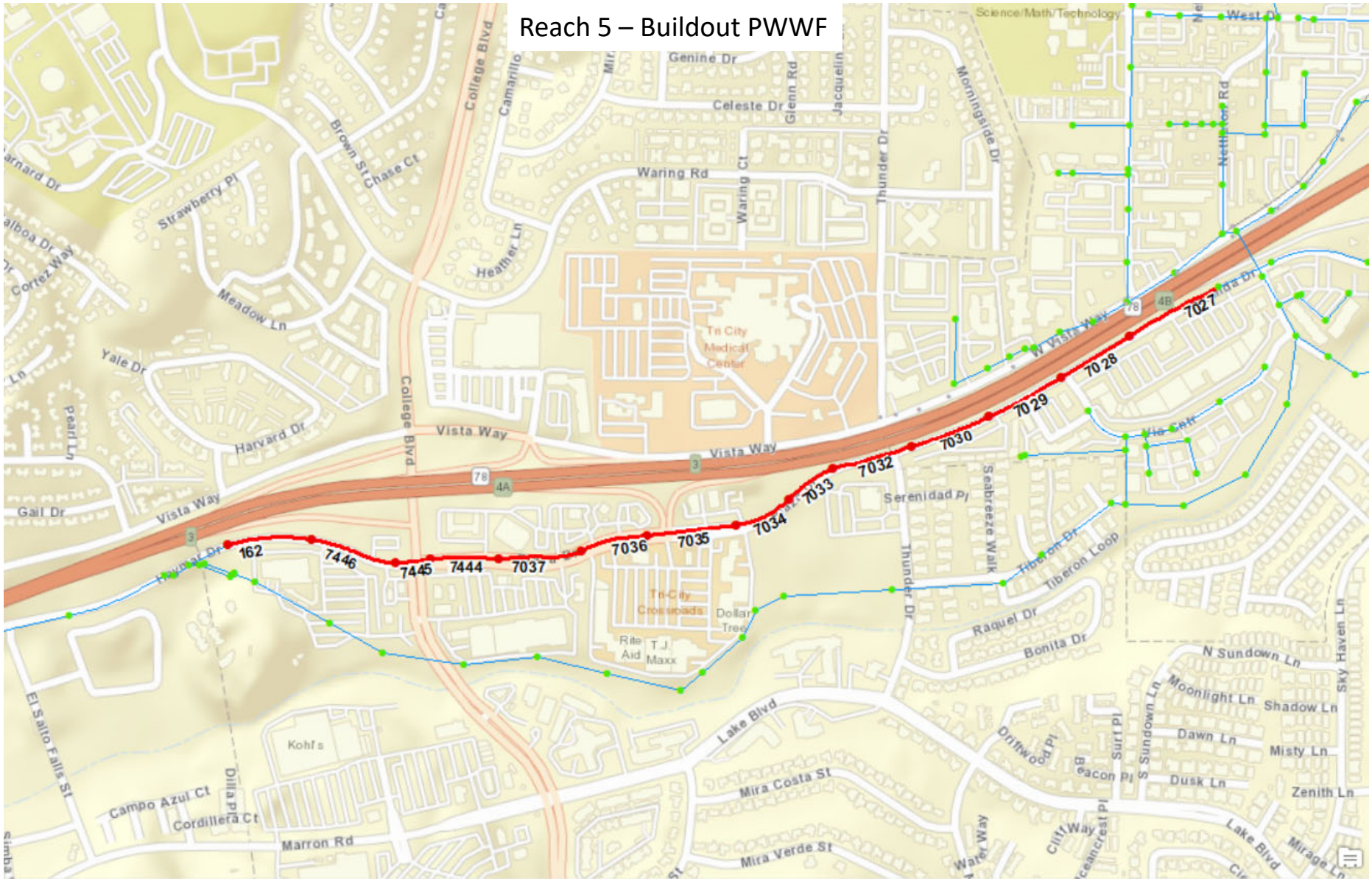



Reach 4 – Buildout PWWF
7404
7405
7406
7407
7408
7409
7411
7412
7022
7023
7024
7025
7026
Costco
Bedrosians Tile & Stone
Ferguson
Bella Mente Montessori Academy
Tri-City Christian Schools
Buena Vista Creek
Hacienda Dr
W Vista Way
Rainbow Ct
Nettleton Rd
S Emerald Dr
Date St
Durum St
Tri City Carpet
Boost Mobile
West Ln
Cedar Rd
Rio Way
Sunset Dr
Sun Hing Buffet
David's Bridal

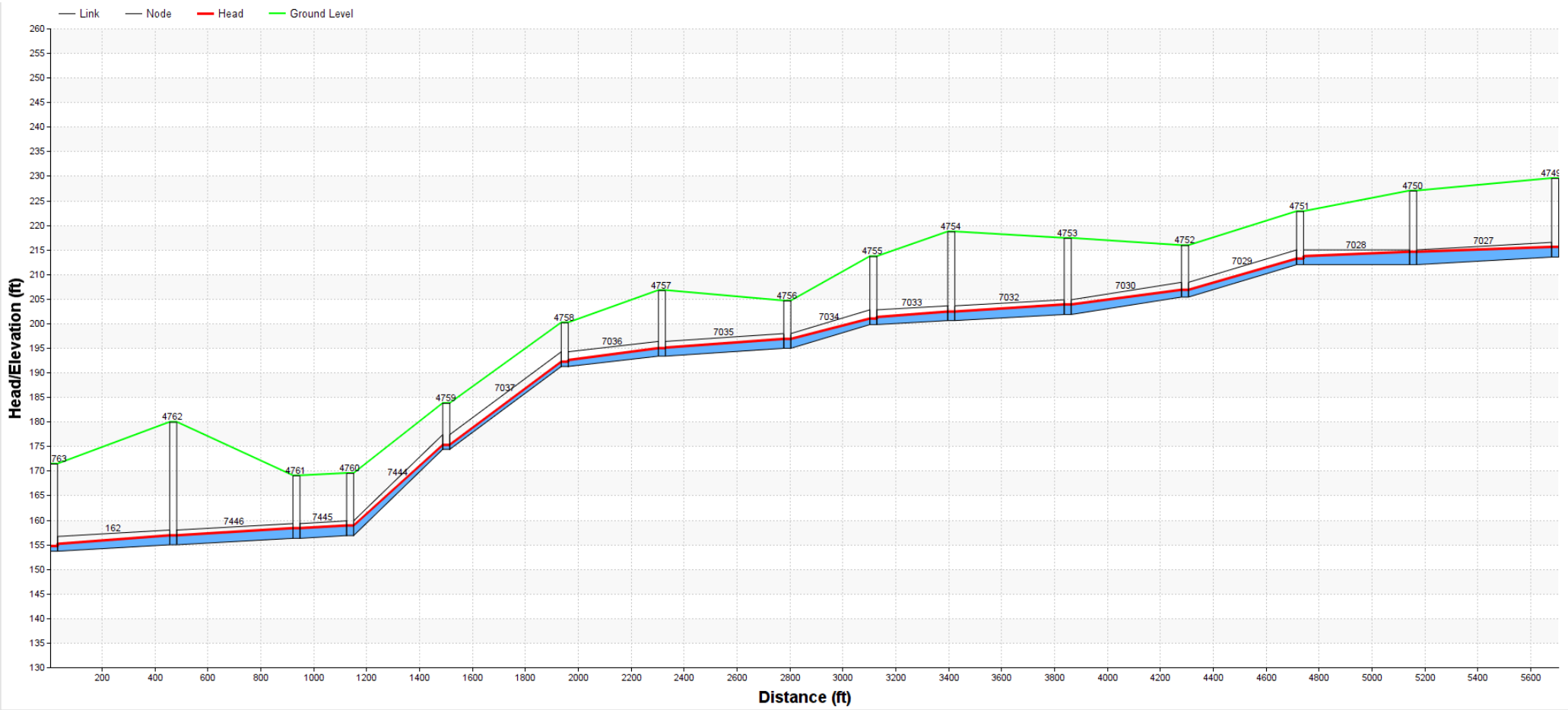
Reach 4 – Buildout PWWF



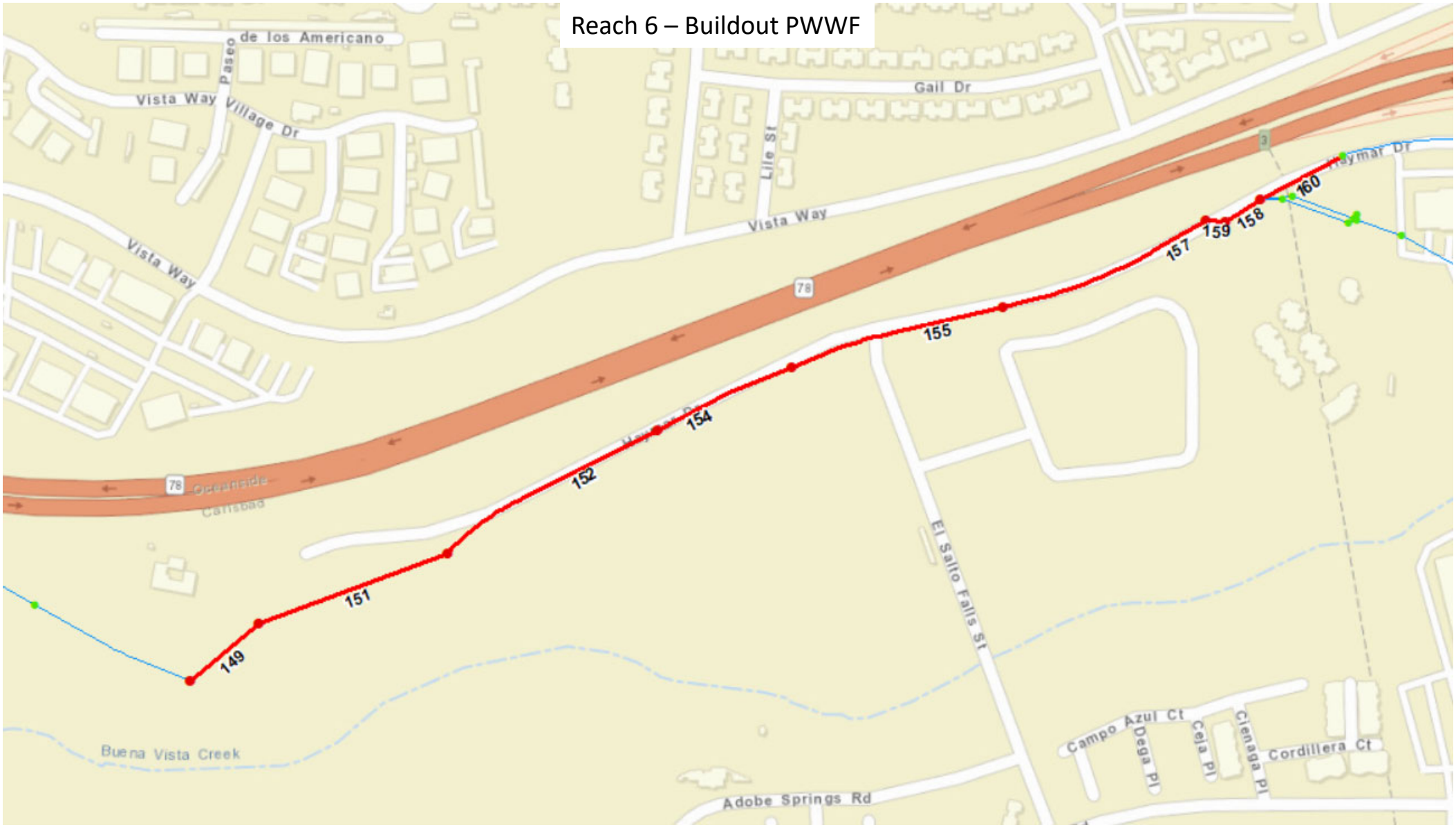
Reach 5 – Buildout PWWF



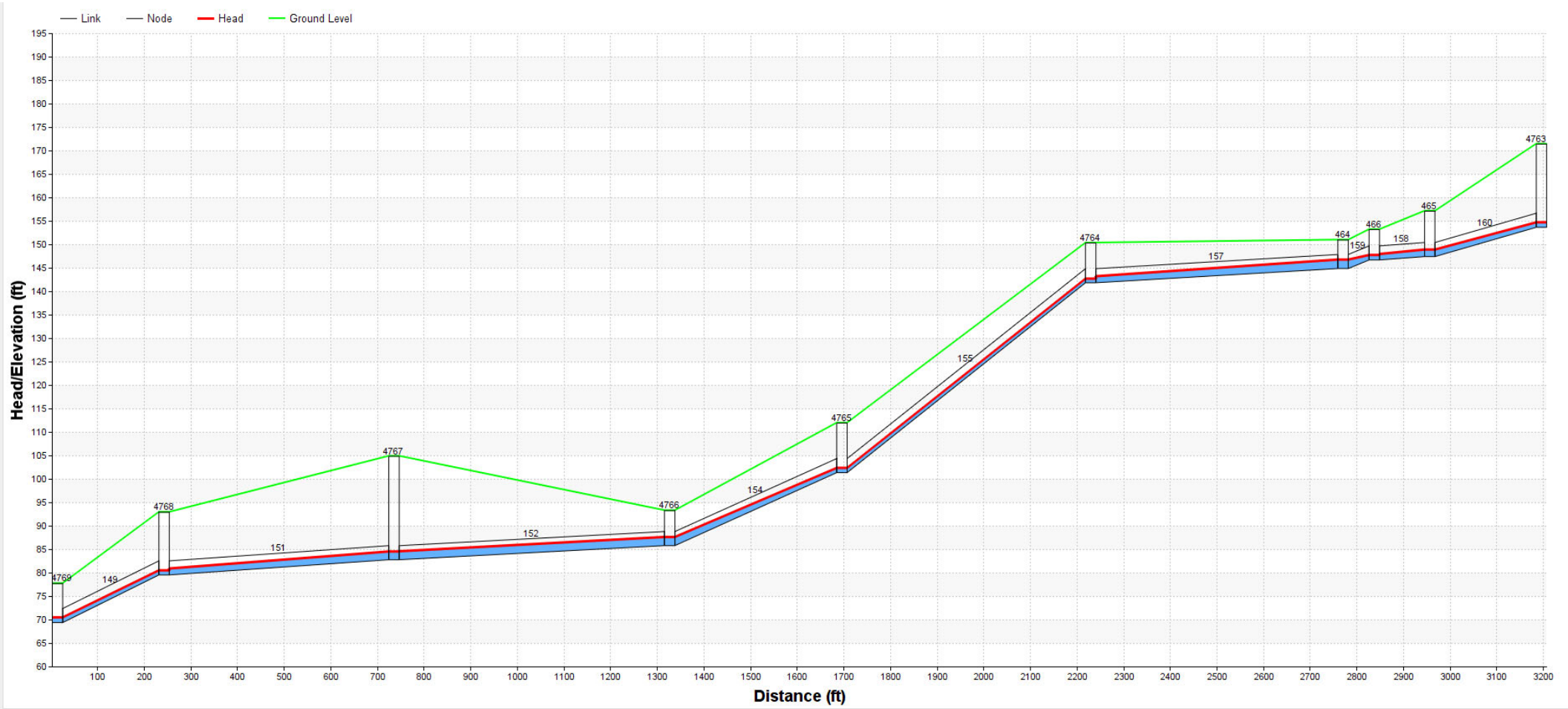
Reach 5 – Buildout PWWF

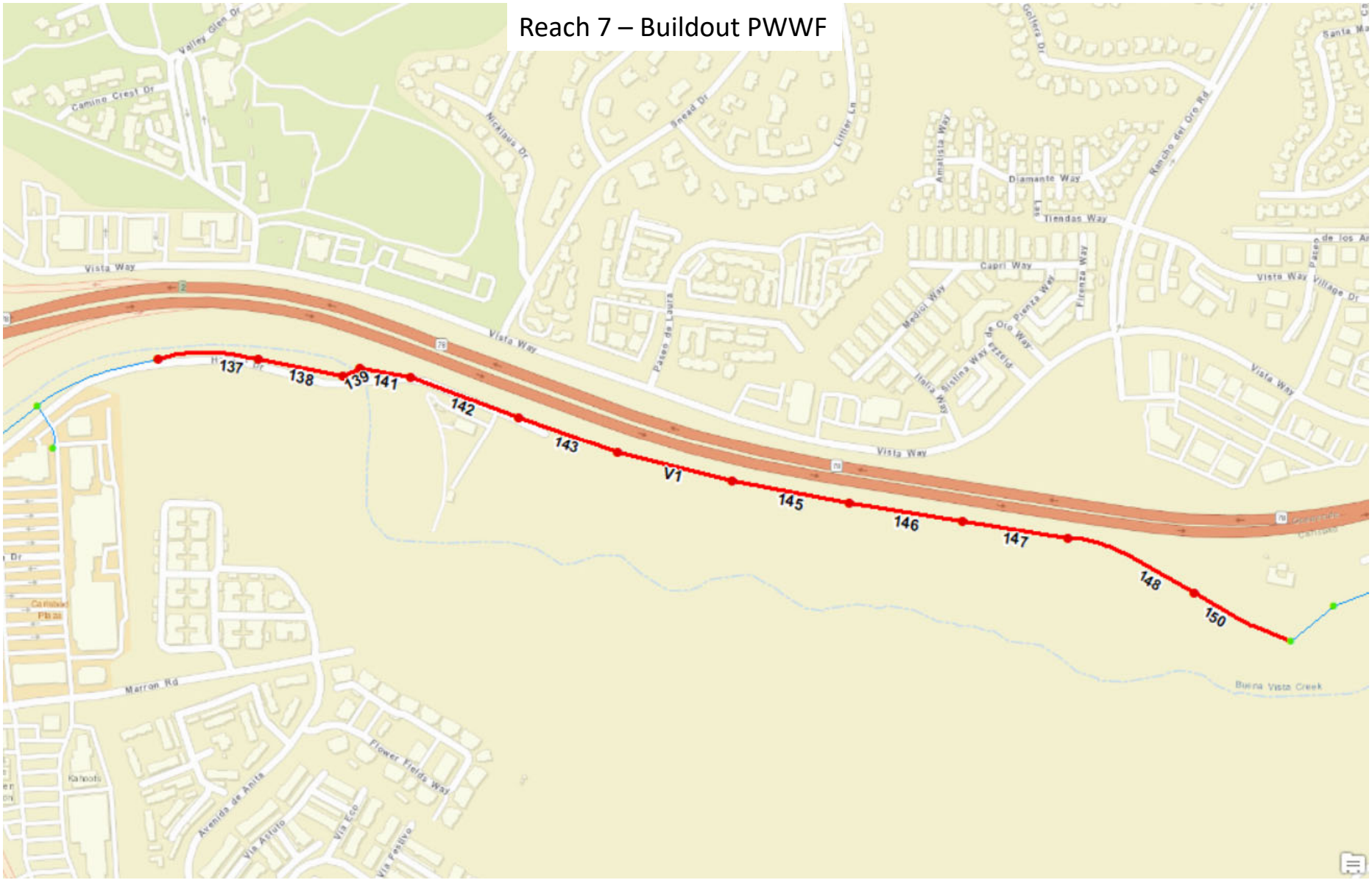


Reach 6 – Buildout PWWF

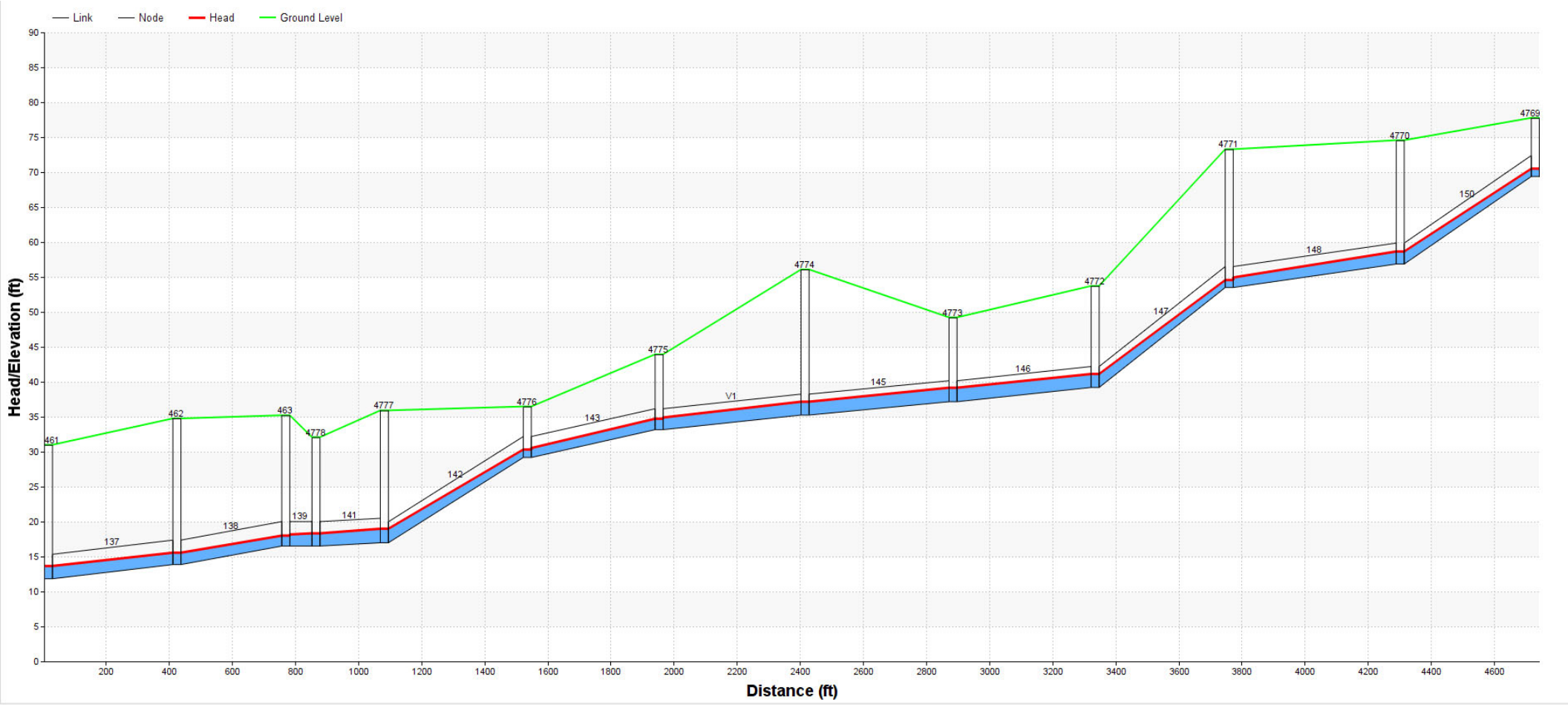


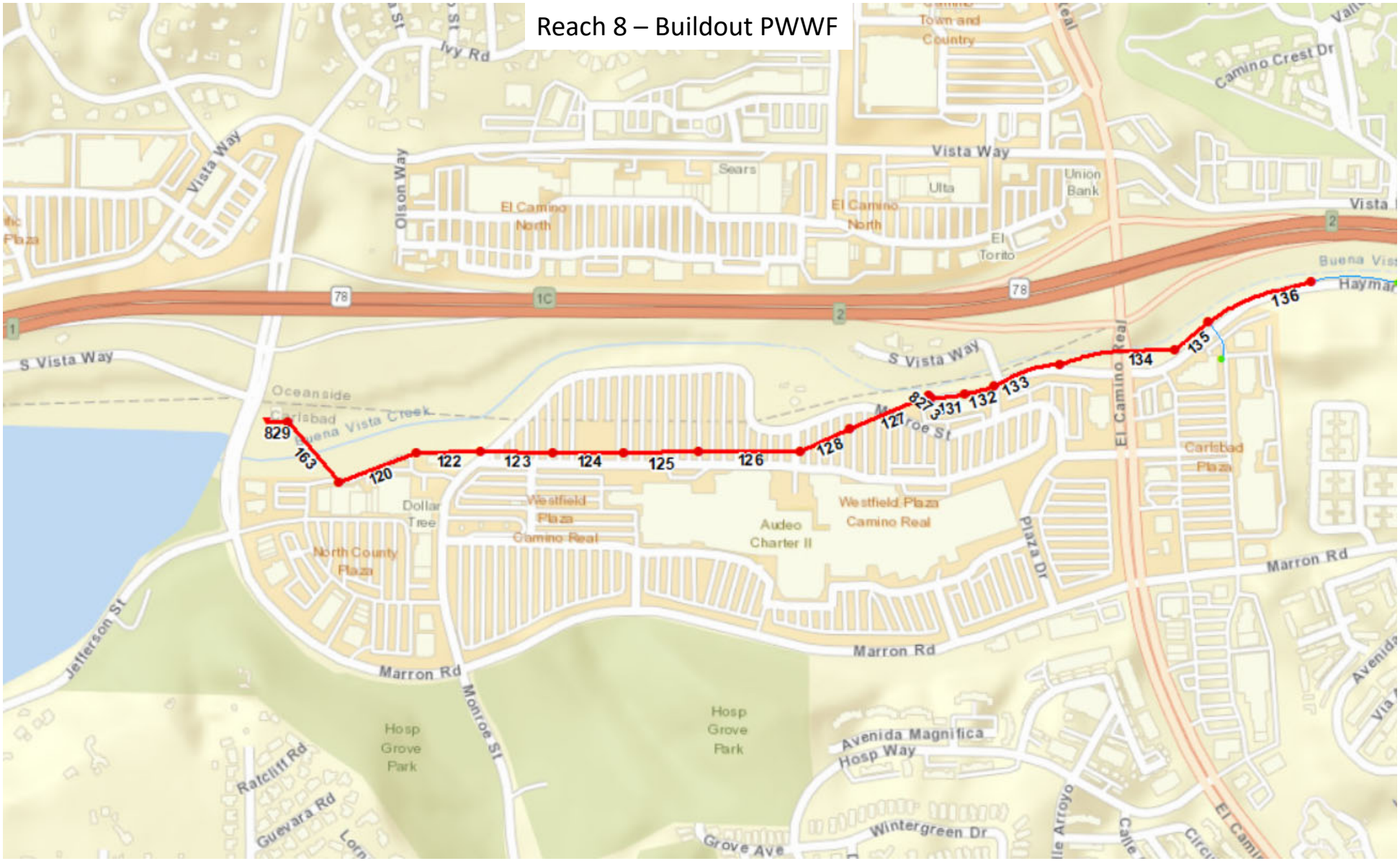
Reach 6 – Buildout PWWF




Reach 7 – Buildout PWWF
137
138
139
141
142
143
V1
145
146
147
148
150
Vista Way
Camino Crest Dr
Valley Glen Dr
Nicolaus Dr
Bread Dr
Littler Ln
Diamante Way
Las Tiendas Way
Capri Way
Medici Way
Firenza Way
Piazza Way
Via Sistina Way
Paseo de Laura
Rancho del Oro Rd
Vista Way Village Dr
Marron Rd
Flower Fields Way
Avenida de Anita
Via Arriulo
Via Eco
Via Festiva
Buena Vista Creek

Reach 7 – Buildout PWWF




Reach 8 – Buildout PWWF
829
163
120
122
123
124
125
126
128
127
131
132
133
134
135
136
Ivy Rd
Vista Way
Olson Way
Sears
El Camino North
Ulta
Union Bank
El Torito
Town and Country
Camino Crest Dr
78
1C
2
S Vista Way
Oceanside
Carlsbad
Buena Vista Creek
Monroe St
El Camino Real
Carlsbad Plaza
Dollar Tree
Westfield Plaza Camino Real
North County Plaza
Audeo Charter II
Plaza Dr
Marron Rd
Jefferson St
Hosp Grove Park
Ratcliff Rd
Guevara Rd
Avenida Magnifica
Hosp Way
Wintergreen Dr
Grove Ave

Reach 8 – Buildout PWWF