

APPROVED

DATE 4/7/2014 BY DJ Ramirez

CITY OF GOODYEAR ENGINEERING

WEST GOODYEAR CENTRAL PLANNING AREA MASTER WATER STUDY UPDATE

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1.0 INTRODUCTION

1.1 General Description

In 2005 an association of 16 West Goodyear property owners formed a group known as the Initial Development Group (IDG) to develop a plan to solve water and sewer service issues in the area of the City of Goodyear (COG) known as the West Goodyear Central Planning Area (WGCPA), which may be described as the area of the COG bordered by I-10 on the north, Perryville Road on the west, MC 85 on the south, and Cotton Lane on the east. To that end, the IDG negotiated a Memorandum of Understanding (MOU) with COG that stipulated among other things that a master water and wastewater studies be performed to quantify the WGCPA's necessary infrastructure improvements and service capacity needs to satisfactorily provide water and sewer service to the WGCPA. The IDG retained Coe & Van Loo Consultants, Inc. (CVL) to prepare the required master water and wastewater study documents. The WGCPA Water and WGCPA Wastewater master studies were completed and approved by COG in July 2006.

The MOU also stipulated that each of the participating property owners within the IDG enter into a Development Agreement (Agreement) with the COG. Each Agreement had a 5-year "Sunset" term at the end of which all provisions would expire unless plats were recorded and all agreed upon development fees paid to COG. With only 2 of the 16 IDG Properties having proceeded, under the terms of their Agreement, letters from the COG began being received by the various members of the IDG on October 15, 2010, stating that COG planned to allow the Development Agreements to lapse. Six (6) of the remaining 14 IDG properties responded to the COG with applications for an amendment to their Development Agreements that would extend the Sunset provision of the Agreement by two (2) years allowing time to renegotiate the terms of the Agreement and then have a new Agreement for these six (6) remaining IDG properties heard and ruled on by COG City Council.

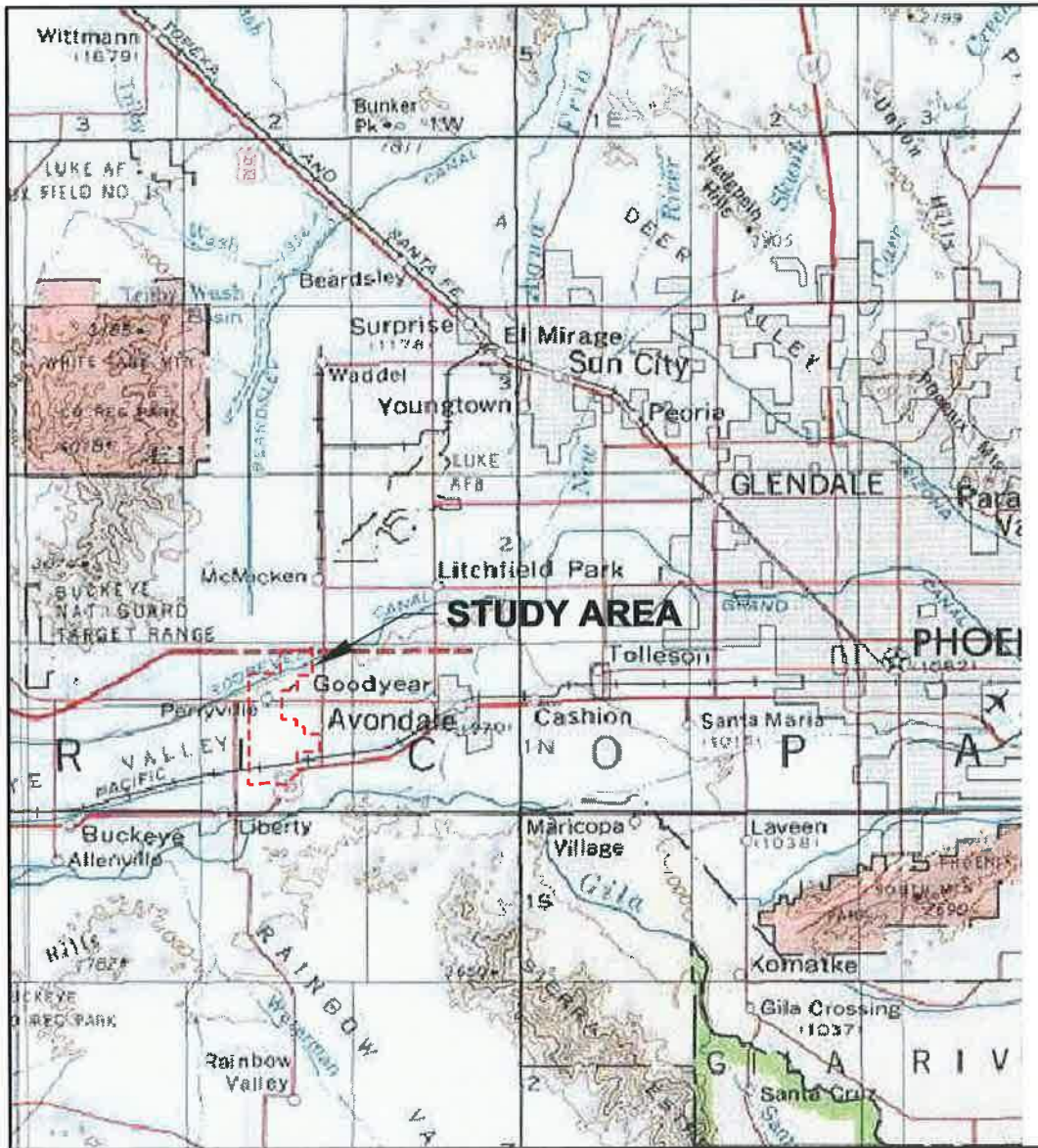
In December of 2011, the COG City Council approved Amendments for the six (6) responding IDG Members, which clarified the COG's position and indicated that the granting of a two-year extension would require that certain obligations be fulfilled by the six responding IDG Members including the preparation of new updated WGCPA Water and Wastewater Master Studies, which would reflect the findings of the COG's Integrated Water Master Plan (IWMP) and the recalculation of WGCPA's necessary Water and Wastewater infrastructure improvements and service capacity needs as well as cost allocation tables for the planned infrastructure improvements. The following report fulfills this requirement for the WGCPA Water.

The water system infrastructure needs of the WGCPA have been updated and are presented in this report. See Figure 1 for a project vicinity map.

1.2 Scope of Work

The five responding IDG Members retained CVL to complete an update to the previously completed Water Master Plan as discussed above. This study determines what system improvements to source, distribution, storage, and infrastructure are necessary to provide service to WGCPA properties not already served by existing COG facilities. This study has also recalculated the allocation of costs for these new or updated water infrastructure facilities to the

WEST GOODYEAR CENTRAL PLANNING AREA



SCALE: N.T.S.

VICINITY MAP

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MASTER WATER STUDY

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FIGURE

1

participating IDG properties as well as those other WGCPA properties not already served by existing COG water infrastructure facilities. The cost allocation for the new water infrastructure facilities is based on an equivalent dwelling unit basis allocated over those WGCPA properties not currently served by existing City water facilities. Equivalent dwelling units were determined per the 2008 IWMP and have been calculated by dividing the Average Daily Demands for each parcel by 390 gpd/DU, the demand unit factor for SF land use, see Table 1. The cost allocation for delivery lines shall be based on a gross area basis further discussed in Section 7.0.

This report provides for the following tasks:

- Obtain the latest updates to the IWMP and review those portions applicable to the WGCPA.
- Verify and/or update the dwelling unit counts and land use plans for each IDG property. Review the COG's latest land use plan for the study area limits. Update the dwelling unit counts accordingly.
- Calculate demands for each IDG property and those areas not part of the IDG within the WGCPA using the IWMP unit factors:
 - Average day demands.
 - Maximum day demands.
 - Peak hour demands.
 - Fire flows.
- Develop an infrastructure grid from the IWMP for the alignment of transmission mains within the WGCPA.
- Develop a general layout of a water system to serve the ultimate WGCPA demands. Identify the demand nodes on this grid to be depicted as an exhibit.
- Provide this information to Tata & Howard, the COG's water modeling firm. Tata & Howard will modify the current Goodyear Water System water model to include the WGCPA demands, as calculated by CVL. The modeling results will be provided to CVL by Tata & Howard for incorporation in the new Water Master Study.
- Prepare a new report summarizing our findings for review and approval by COG. The report will contain the following discussion points:
 - Introduction.
 - Design Criteria.
 - System Demands.
 - Existing Infrastructure.
 - Proposed Infrastructure.
 - Wells.
 - Treatment Requirements and Brine Disposal.
 - Storage.
 - Booster Pumping.
 - Transmission Mains.
 - Water System Modeling (results from Tata & Howard)

- Cost Analysis and Allocation to the service area properties identified in this report have been updated and reflect the latest findings of this report. See Section 8.2 for an in-depth discussion.
- Summary and Conclusions.

Well Study:

- Water supply will be provided by wells located within or in close proximity to the WGCPA study limits. CVL will perform a cursory evaluation of available groundwater facilities. This work shall consist of the following:
 - Review of available data on agricultural wells within or adjacent to the WGCPA.
 - Obtain well production and water quality data from ADWR, COG, or irrigation districts, as necessary.
 - Obtain water samples and perform water testing for arsenic, fluoride, nitrates, and Total Dissolved Solids (TDS) for up to four (4) wells. The chemical analyses of the collected well water will be performed by a laboratory licensed in the State of Arizona.
 - Water quality and treatment requirements and brine disposal.
 - Surface water sources/other sources.

1.3 Location

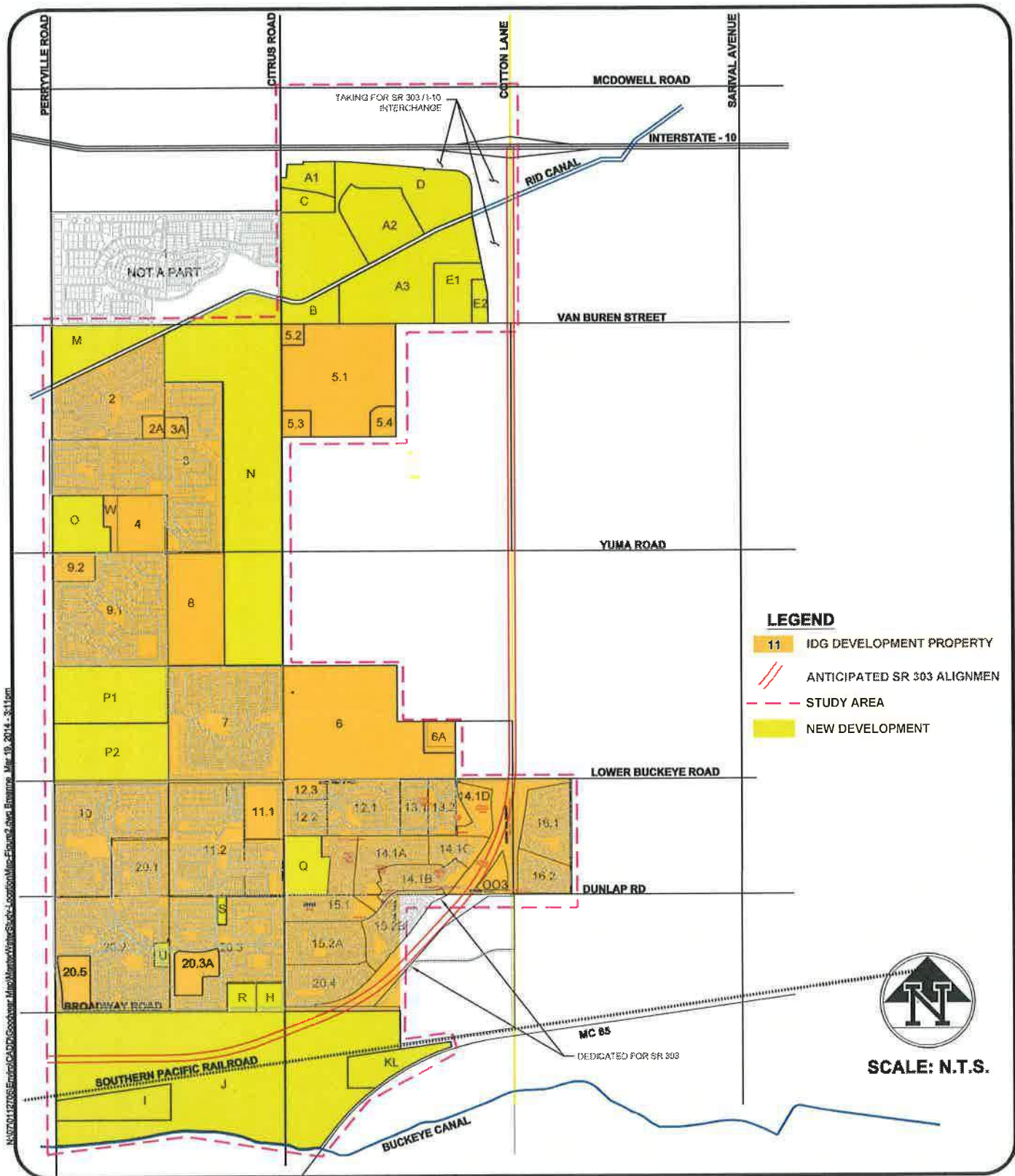
The West Goodyear water service area is approximately 3,500 acres and is bounded on the north by the Interstate-10 (I-10), on the east by Citrus/Cotton Lane, on the west by Perryville Road and on the south by the RID Canal, and includes portions of sections 2, 3, 10, 11, 14, 15, 22, 23, 24, 26 and 27 of Township 1 North, Range 2 West of the Gila and Salt River base and Meridian, Maricopa County, Arizona. See Figure 2.

1.4 Land Use and Population

The City of Goodyear Land Use Plan for 2012 was used to generate the potable water demands for the WGCPA (See Appendix A) for those areas of the study area not part of the IDG. Input from the COG Engineering and Planning Departments was obtained in several meetings held in January and February 2012 to clarify the intent of the Land Use Plan and obtain guidance in assigning a land use designation to County Islands located within the study area. The area consists mostly of single-family residential with industrial and commercial properties designated in the northern and southern portions of the study area. A breakdown of land use and dwelling unit densities is presented in Figure 3 for IDG lands and additional development properties. Water demands for the study area are based on dwelling units and acreage and not per capita use, therefore, no population projections are required.

1.5 Topographic Conditions

The existing natural topography of the WGCPA is relatively flat. The study area slopes from northwest to southeast. The high point within the service area property is in the northeast portion of the site at the intersection of Cotton Lane and the I-10, with an approximate elevation of 1,010 feet. The low point in the south portion of the site located at the intersection of Citrus Road and the Buckeye Canal, with an approximate elevation of 889 feet.



LOCATION MAP

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MASTER WATER STUDY

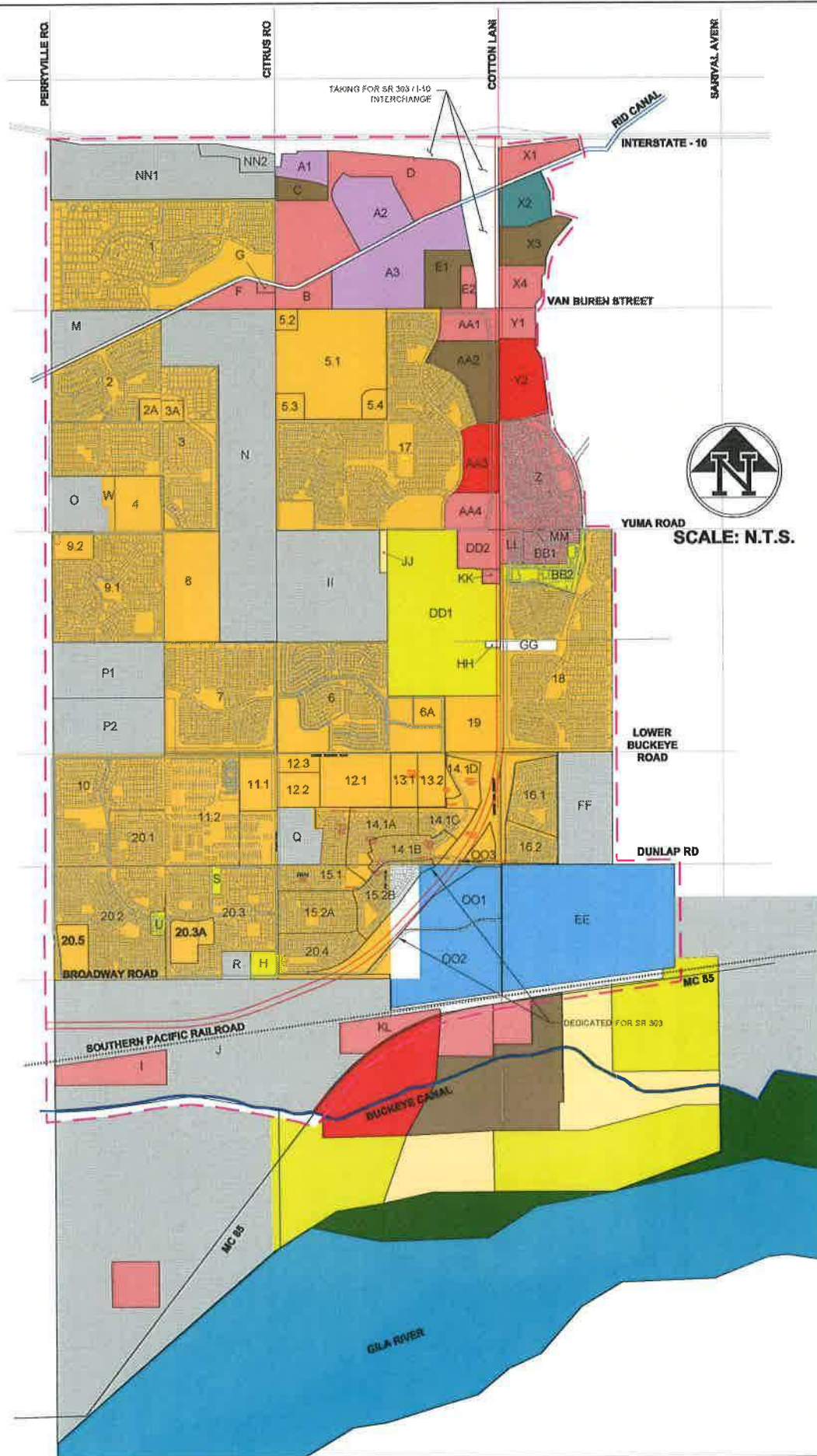
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FIGURE

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Area	IDG Development Group Properties	Land Use	Area	Units	Density	Unit Flow	Unit Flow	Average Flows
ID			(acres)		(du/ac)	(gpud)	(gpud)	(gpd)
1	Las Palmas	Single Family	273	750	2.75	144	-	108,000
2	Amber Meadows	Single Family	102	283	2.87	144	-	42,192
2A	Amber Meadows School	School	6	-	-	1019	-	6,114
3	La Privada	Single Family	194	569	2.93	144	-	81,936
3A	La Privada School	School	6	-	-	1019	-	6,114
4	Paseo Ridge Phase II	Single Family	40	114	2.85	144	-	16,416
5.1	Silva-Rose Gardens	Single Family	135	384	2.84	144	-	55,296
5.2	Silva-Rose	Commercial Pad	7	-	-	951	-	6,657
5.3	Silva-Rose Gardens	City Water & Fire Campus	10	-	-	1019	-	10,190
5.4	Silva-Rose Gardens	Charter School	8	-	-	1019	-	8,182
6	La Jolla Vista	Single Family	188	690	3.67	144	-	99,360
6A	La Jolla Vista School	School	12	-	-	1019	-	12,228
7	Pradera	Single Family	160	456	2.85	144	-	65,664
8	Paseo Ridge Phase I	Single Family	80	214	2.68	144	-	30,816
9.1	Las Ventanas Single Family	Single Family	145	413	2.85	144	-	59,472
9.2	Las Ventanas	Commercial Pad	15	-	-	951	-	14,265
10	Las Brisas Phase I	Single Family	120	324	2.70	144	-	46,656
11.1	Levinson	Commercial Pad	27	-	-	951	-	25,677
11.2	Levinson	Single Family	133	422	3.17	144	-	60,768
12.1	Citrus Ridge	Agua Fria HS District	50	-	-	1019	-	50,950
12.2	Citrus Ridge (R1-6)	Single Family	19	90	4.81	144	-	12,960
12.3	Citrus Ridge (C2)	Commercial Pad	8	-	-	951	-	7,998
13.1	Cotton Commons (MHD)	Multi-Family	20	300	15.00	124	-	37,200
13.2	Cotton Commons (MD)	Multi-Family	20	160	8.00	128	-	20,480
14.1a	El Cidre Ranch	Single Family	38	130	3.43	144	-	18,720
14.1b	El Cidre Ranch	Single Family	28	105	3.81	144	-	15,120
14.1c	El Cidre Ranch	Single Family	18	55	3.00	144	-	7,920
14.1d	El Cidre Ranch	Multi-Family	18	178	9.88	128	-	22,784
15.1	El Cidre Ranch	Single Family	48	164	3.41	144	-	23,616
15.2a	El Cidre Ranch	Single Family	42	181	3.79	144	-	23,194
15.2b	El Cidre Ranch	Single Family	39	159	4.11	129	-	20,511
16.1	El Cidre Ranch	Single Family	42	140	3.30	144	-	20,160
16.2	El Cidre Ranch	Single Family	24	94	3.96	144	-	13,536
17	Canyon Trails 4 West (Context)	Single Family	310	1064	3.43	144	-	153,216
18	Canyon Trails 4 South (TM)	Single Family	255	717	2.81	144	-	103,248
19	Sin Lomas	Single Family	40	135	3.38	144	-	19,440
20.1	Las Brisas Phase 2	Single Family	40	111	2.78	144	-	15,984
20.2	Las Brisas Phase 2	Single Family	150	416	2.78	144	-	59,968
20.3	Las Brisas Phase 2	Single Family	131	364	2.78	144	-	52,372
20.3A	Las Brisas Phase 2 School	School	17	-	-	1019	-	16,915
20.4	El Cidre Ranch	Single Family	38	158	4.19	129	-	20,382
20.5	Las Brisas Phase 2	Commercial Pad	19	-	-	951	-	18,259
Sub Total			3,076	9,330				1,510,89

AVERAGE DAILY FLOW (ADD) = 3.65 MGD
MAX DAY FLOW (ADD X 2.89) = 10.54 MGD

LEGEND

- | | |
|-------|---------------------------------|
| 11 | IDG DEVELOPMENT PROPERTY |
| LDR | LOW DENSITY RESIDENTIAL |
| L-MDR | LOW-MEDIUM DENSITY RESIDENTIAL |
| MDR | MEDIUM DENSITY RESIDENTIAL |
| M-HDR | MEDIUM-HIGH DENSITY RESIDENTIAL |
| HDR | HIGH DENSITY RESIDENTIAL |
| CC | COMMUNITY COMMERCIAL |

- | | |
|--------|------------------------------|
| LI | LIGHT INDUSTRIAL |
| GI | GENERAL INDUSTRIAL |
| OS | OPEN SPACE |
| COUNTY | COUNTY |
| --- | ANTICIPATED SR 303 ALIGNMENT |
| --- | STUDY AREA |

Area	Additional Development Properties	Land Use	Area	Units	Density	Unit Flow	Average Flows
(ID)			(acres)		(du/ac)	(gpud)	(gpd)
A1	-	Light Industrial	10	-	-	815	8,150
A2	-	Light Industrial	50	-	-	815	40,750
A3	-	Light Industrial	72	-	-	815	58,346
B	-	Community Commercial	20	-	-	951	19,020
C	-	M-HDR Multi-Family	10	150	15	124	18,600
D	-	Community Commercial	116	-	-	951	110,316
E1	-	M-HDR Multi-Family	20	300	15	124	37,200
E2	-	Community Commercial	5	-	-	951	4,755
F	-	Community Commercial	20	-	-	951	19,020
G	-	Community Commercial	2	-	-	951	1,902
H	-	LDR	10	30	3	144	4,320
I	-	Community Commercial	40	-	-	951	38,040
J	-	County Land-Light Industrial	370	-	-	815	301,590
K	-	Community Commercial	20	-	-	951	19,020
L	-	Community Commercial	7	-	-	951	6,657
M	-	County Land-RR	45	45	1	160	7,200
N	-	County Land-RR	250	250	1	160	40,000
O	-	County Land-LDR	30	90	3	144	12,960
P1	-	County Land-LDR	75	225	3	144	32,400
P2	-	County Land-RR	75	75	1	160	12,000
Q	-	County Land-LDR	30	90	3	144	12,960
R	-	County Land-LDR	10	30	3	144	4,320
S	-	LDR	3	9	3	144	1,296
U	-	LDR	5	15	3	144	2,160
W	-	LDR	7	21	3	144	3,024
X1	-	Community Commercial	26	-	-	951	24,726
X2	-	HDR Multi-Family	30	750	25	110	82,500
X3	-	M-HDR Multi-Family	31	465	15	124	57,660
X4	-	Community Commercial	23	-	-	951	21,873
Y1	-	Community Commercial	14	-	-	951	13,314
Y2	-	MDR Multi-Family	46	368	8	128	47,104
Z	-	Community Commercial	104	-	-	951	98,904
AA1	-	Community Commercial	24	-	-	951	22,824
AA2	-	M-HDR Multi-Family	47	705	15	124	87,420
AA3	-	MDR Multi-Family	33	264	8	128	33,792
AA4	-	Community Commercial	26	-	-	951	24,726
BB1	-	Community Commercial	14	-	-	951	13,314
BB2	-	LDR	27	81	3	144	11,664
DD1	-	LDR	214	642	3	144	92,448
DD2	-	Community Commercial	21	-	-	951	19,971
EE	-	General Industrial	258	-	-	1087	280,446
FF	-	County Land-RR	80	80	1	160	12,800
GG	-	Open Space	8	0	0	0	0
HH	-	Open Space	1	0	0	0	0
II	-	County Land-RR	155	155	1	160	24,800
JJ	-	L-MDR Single-Family	4	20	5	129	2,580
KK	-	Community Commercial	3	-	-	951	2,853
LL	-	Community Commercial	10	-	-	951	9,510
MM	-	Community Commercial	7	-	-	951	6,657
NN1	-	County Land-Community Commercial	141	-	-	951	134,091
NN2	-	County Land-Light Industrial	13	-	-	815	10,391
OO1	-	General Industrial	50	-	-	1087	53,817
OO2	-	General Industrial	114	-	-	1087	123,378
OO3	-	Community Commercial	8	-	-	951	7,617
Sub Total			2,853	4,800			2,137,34
Grand Total of Service Area			5,929	14,130			3,648,24

WEST GOODYEAR CENTRAL PLANNING AREA

WASTEWATER STUDY AREA - LAND USE

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FIGURE
3

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2.0 WATER SYSTEM DESIGN CRITERIA

The design criteria used to estimate water demands for this project in this report are based on the 2008 IWMP supplemented by the *City of Goodyear Engineering Design Standards and Policy Manual* dated 2007 and City Staff; unless otherwise noted, all design criteria used in these calculations were obtained from these references.

2.1 Water Demand Criteria

The potable water demand criteria used for the WGCPA are summarized in Table 1. Demand criteria are obtained from the City of Goodyear 2008 Integrated Master Plan.

Table 1 – Water Demand Criteria

Land Use	Average Day Demand Factor	Fire Flow Demand ¹
Single-Family Residential		
Rural (0-2 DU/Ac)	444 gpd/DU	1,500 (gpm)
Low Density (2-4 DU/Ac)	390 gpd/DU	1,500 (gpm)
Low-Medium Density (4-6 DU/Ac)	320 gpd/DU	1,500 (gpm)
Multi-Family Residential		
Medium Density (6-10 DU/Ac)	285 gpd/DU	1,500 (gpm)
Medium-High Density (10-20 DU/Ac)	256 gpd/DU	1,500 (gpm)
Industrial/Commercial		
Light Industrial	1,742 gpd/Ac	3,000 (gpm)
Community Commercial	2,033 gpd/Ac	3,000 (gpm)
Public/Quasi Public		
Schools	2,240 gpd/Ac	3,000 (gpm)

¹ Fire flow demand for commercial and industrial assumed to be 3,000 gpm.

Additional design criteria for demand include:

- Maximum day peaking factor is 1.7 times the average day demand.
- Peak hour peaking factor is 2.89 times the average day demand.

2.2 Water Delivery System Criteria

2.2.1 Potable Water Delivery System

The potable water distribution system will operate within minimum and maximum static pressure as designated by the City of Goodyear design standards. In accordance with the City of Goodyear design standards, the potable water distribution system is to be sized to provide maximum day plus fire flow demand and peak hour demand in addition to the following design requirements:

- Pressures
 - Minimum static pressure of 40 psig during average day, maximum day and peak hour demands.
 - Maximum static pressure in the system shall not exceed 80 psig unless individual pressure reducing valves (PRV) are provided.
 - Pressures in the system shall be maintained at 20 psig during maximum day plus fire flow conditions.
- Velocities
 - Maximum = 10 fps under peak hour conditions.
- Hazen-Williams coefficient of 130 will be used to model the water distribution system.
- Unit friction head loss:
 - Maximum: 10 ft per 1,000 ft length during peak hour.
 - Maximum: 8 ft per 1,000 ft length during maximum day.
- Distribution Water Mains
 - Minimum 8-inch diameter lines to serve residential developments with fire hydrants allowed to be fed from one direction.
 - Minimum 12-inch diameter water mains in minor arterial street alignments.
 - Minimum 16-inch diameter water mains in arterial street alignments.

2.3 Water Supply Design Criteria

2.3.1 Well Design Criteria

The City requires that wells supply a total reliable capacity equal to 130 percent of maximum day demand. All well water will be treated so that it meets the current water quality requirements as mandated by Arizona Department of Environmental Quality (ADEQ) and Maricopa County Environmental Services Department (MCESD) including the arsenic MCL concentrations of 10 µg/L. The City standard for TDS is 500 mg/L. As mentioned above, CVL has conducted a Well Study to identify potential sources of groundwater for meeting WGCPA demands. The results of this study are presented in Section 5.0 and indicate that groundwaters have TDS values in excess of the City standard of 500 mg/L, requiring treatment. The report also discussed the potential for obtaining groundwater and/or surface water from utility providers outside the City's service area.

2.3.2 Reservoir Design Criteria

The current City of Goodyear storage design criteria require that a storage volume be provided that meets the larger of the following criteria:

- Twenty-five (25) percent of maximum day demand plus 3 hours of fire flow reserve (largest fire flow).
- One average day demand.

Storage facilities must also provide emergency fire protection and maximize the use of water production facilities. The WGCPA demands and storage requirements have been calculated for ultimate buildout of the study area.

Detailed calculations of the required storage volumes may be found in Section 6.1.

Storage facilities must also provide emergency fire protection and maximize the use of water production facilities. The WGCPA demands and storage requirements have been calculated for ultimate buildout of the study area.

2.3.3 Booster Pump Station Design Criteria

Booster pump stations shall be designed and required to deliver the larger of peak hour demand or maximum day plus the largest fire flow demand. Redundant fire pump capacity will be provided; maximum day demands will be met with the largest pump out of service.

3.0 WATER SYSTEM DEMANDS

The WGCPA average day, maximum day and peak hour potable water demands were calculated in accordance with the demand criteria presented in Table 1 and Section 2.0 of this report.

3.1 Ultimate Potable Water Demands

Table 2a presents the potable water demands for the WGCPA IDG properties. See Appendix B for spreadsheet calculations taken from Figure 3.

Table 2a – Potable Water Demands, IDG Properties

Area ID	Land Use	DU's	Average Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
1	Las Palmas (NOT A PART)	-	-	-	-
2	Amber Meadows	293	79	135	229
2A	Amber Meadows School	-	9	16	27
3	La Privada	569	154	262	445
3A	La Privada School	-	9	16	27
4	Pasco Ridge Phase II	114	31	52	89
5	Silva – Rose Gardens	384	141	240	408
6	La Jolla Vista	690	187	318	540
6A	La Jolla Vista School	-	19	32	54
7	Pradera	456	124	210	357
8	Pasco Ridge – Phase I	214	58	99	167
9	Las Ventanas	452	133	226	384
10	Las Brisas Phase I	324	88	149	254
11	Levison	422	152	259	440
12	Citrus Ridge	90	107	183	311
13	Cotton Commons	460	85	145	246
14	El Cidro Ranch	468	114	193	329
15	El Cidro Ranch	484	123	210	356
16	El Cidro Ranch	234	63	108	183
20	Las Brisas 2 / El Cidro Ranch	1,049	304	516	877
20.3A	Las Brisas 2 School	-	26	44	75
	TOTAL	6,663	2,006	3,411	5,799

Table 2b presents the potable water demands for the WGCPA additional development properties as of 2012. See Appendix B for spreadsheet calculations taken from Figure 3.

Table 2b – Potable Water Demands, Additional Development Properties

Area ID	Land Use	DU's	Average Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
A	Light Industrial	-	159	318	637
B	Community Commercial	-	28	56	113
C	M-HDR Multi-Family ³	150	27	54	108
E	M-HDR Multi-Family ³	300	53	106	212
H	LDR Single Family ²	30	8	16	32
I	Community Commercial	-	56	113	226
J	County Land Light Industrial	-	448	895	1790
K	Community Commercial	-	28	56	113
L	Community Commercial	-	10	20	40
M	County Land-RR ¹	45	14	28	56
N	County Land-RR ¹	250	77	154	308
O	County Land-LDR ²	90	24	48	96
OO3	Community Commercial	-	12	23	46
P	County Land-RR/LDR ^{1,2}	300	84	168	336
Q	County Land-LDR ²	90	24	48	96
R	County Land-LDR ²	30	8	16	32
S	LDR ²	9	2	4	8
U	LDR ²	15	4	8	16
W	LDR ²	21	6	12	24
	TOTAL	1,330	1,244	2,115	3,596

¹RR Rural Residential (0-2 du/ac)

²LDR- Low Density Residential (2-4 du/ac)

³M-HDR Medium-High Density Residential (10-20 du/ac)

Table 2c shows the total potable water demands shown in Tables 2a and 2b.

Table 2c – Summary Water Demands

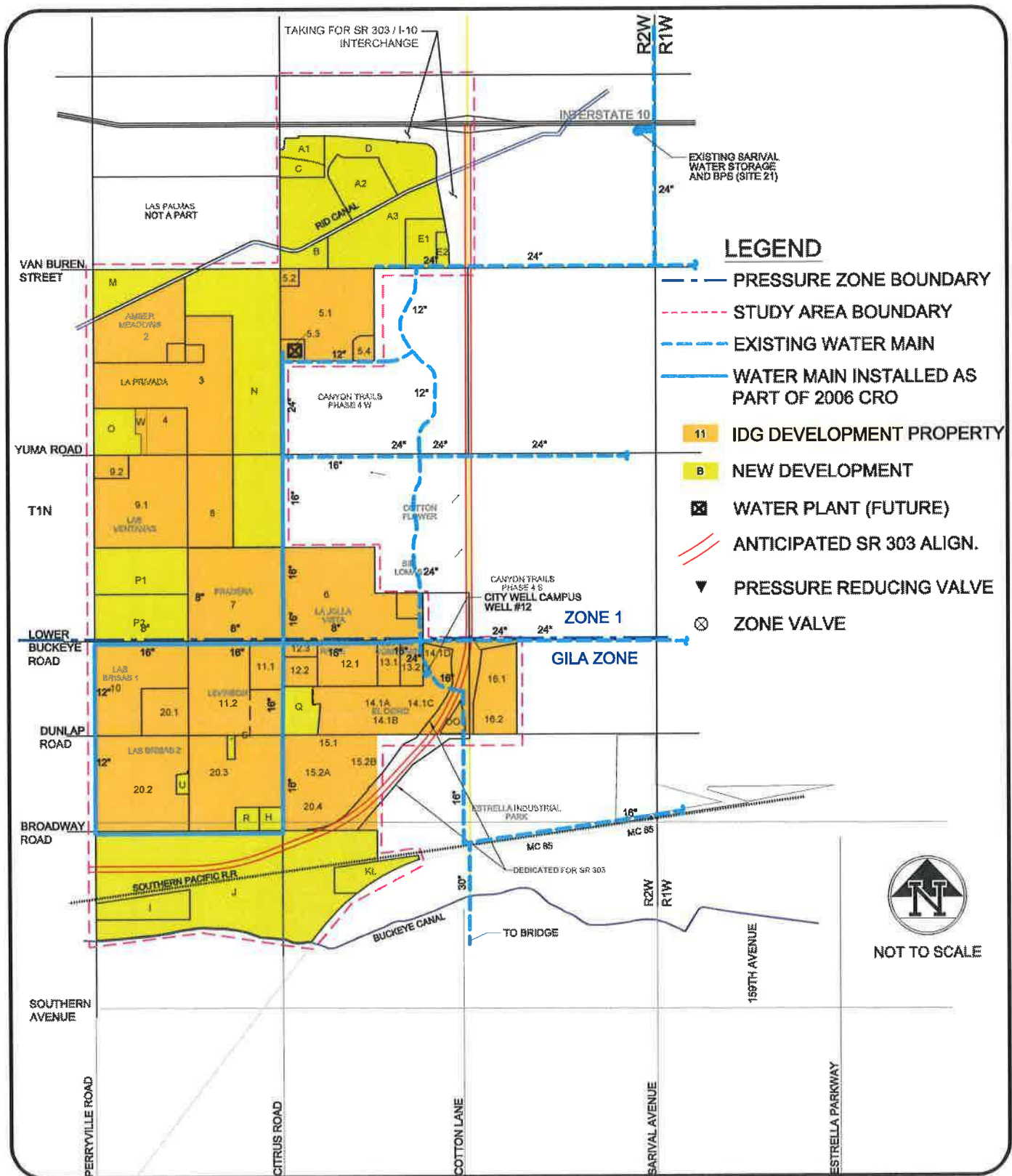
Table	Land Use	DU's	Average Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
2a	All	6,663	2,006	3,411	5,799
2b	All	1,330	1,244	2,115	3,596
	TOTAL	7,993	3,251	5,526	9,394

Table 3 shows potable water demands by pressure zones as defined in the 2008 IWMP and shown in Appendix A.

Table 3 – Ultimate Potable Water Demands by Zone per the 2008 IWMP

Zone	Average Day Demand (gpm)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
Zone 1	1,587	2,698	4,587
Gila River Zone	1,663	2,828	4,807
TOTAL	3,251	5,526	9,394

Pressure zones are shown in Figure 4.



MASTER WATER STUDY

EXISTING WATER MAINS & ZONES

JOB NO

1.07.0112705

4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
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COE & VAN LOO
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FIGURE

4

4.0 EXISTING INFRASTRUCTURE

The existing COG Water Distribution System Model currently maintained by Tata & Howard as consultants to the COG served as the template for the analysis of the WGCPA study area. The WGCPA system was modeled as a standalone system independent of the City's existing or proposed production, storage, or pumping resources. The size of the required water infrastructure necessary to provide service to the WGCPA was determined. Water pressures, required system production and distribution system improvements necessary to meet ultimate WGCPA needs were identified. See Section 6.0 for a full discussion.

4.1 Water Service Area

Most, but not all, of the WGCPA study area is within the COG water service area. Figure 4 indicates that the area west and north of Van Buren and Citrus is within the Arizona Water Company service area. A small area in Section 14, T1N, R2W is in the Valencia Water District.

4.2 Existing Distribution System

There have been improvements to the COG's water distribution system since the completion of the 2006 Water Master Plan. Water mains have been installed in Citrus Road, Lower Buckeye and the southwest quadrant of the study area as a result of development in those areas. Figure 4 depicts the existing water main system within the WGCPA and differentiates between water mains installed as part of the 2006 Cost Recovery Ordinance (CRO) and those installed by others or the City independently of the CRO. Those lines installed as part of the 2006 CRO will not be impacted by the modifications to the distribution system described in this report.

The City's quarter section water maps, updated on January 24, 2012, were used to prepare this exhibit. See Figure 4.

4.3 Existing Production and Storage Systems

There is an existing storage tank and booster pump station (BPS) located north of the project site at the intersection of Sarival Avenue and the I-10 (Site #21). The storage tank has a capacity of 2 million gallons (MG). There is also an existing water plant and well, located approximately at 173rd Avenue and Lower Buckeye Road known as Site #12. It contains the following: one (1) 2 MG tank, 2-500 gpm booster pumps and 1-1,000 gpm fire pump. The well produces approximately 800 gpm of warm (102°F), high TDS (1,500 mg/L) water. The City has purchased approximately 8.6 acres of land on the northeast corner of Harrison Street and Citrus Road. This land will be the site of a future reservoir, treatment facility, and booster pump station site that will serve the Zone 1 pressure zone and also the Gila Zone found within the WGCPA limits. This new facility is identified in Figure 4 as the West Goodyear WTF. It will be the sole facility supplying water to both pressure zones in the WGCPA study area.

The City began accepting delivery of groundwater from two (2) wells located in the Adaman Mutual Water Service area in 2011. Current deliveries are approximately 2.5 MGD and are expected to increase to a maximum of 10 MGD as stipulated in an IGA approved by the Arizona Corporation Commission. The City has currently received approval to obtain a maximum 4 MGD. Staff has indicated that ADEQ/ADWR approval of the withdrawal of quantities in excess of 4 MGD will require a study that demonstrates that the resulting drawdown will not affect migration of the PGA groundwater contaminants and that ADWR's well drawdown model

functions within acceptable levels with the additional pumping. It should be further noted that 1.5 MGD from the 4.0 MGD allocation has already been committed by agreement with the City to other users within the City's system. Water from these wells is transported in a 30-inch main in Sarival, south to the Site #21 reservoir. On site booster pumps deliver this water to the COG distribution system through a 24-inch in Sarival.

5.0 WELL STUDY

5.1 General

This report calculates the anticipated demands for the WGCPA at buildout conditions. These demands are to be met by developing water production facilities that do not currently exist. The traditional water source for the Goodyear service area has been obtained by the development of wells. The groundwater quality of the aquifer beneath this area of Goodyear is poor to fair, with concentrations of TDS, arsenic, and nitrates typically above the maximum containment limits (MCL) set by statute for these constituents. Water temperatures are also high, with readings commonly found above 100° F. Review of available well water quality data for City and irrigation wells within the WGCPA area reveals that groundwater quality generally improves from south to north. The purpose of this study was to determine if acceptable water quality could be found in the northern reaches of the WGCPA by the sampling of selected wells. The selection of these sampling wells was also made with the thought of developing these wells as potable water wells required to meet WGCPA demands.

5.2 Description

The well spacing study performed by Clear Creek Associates as part of the 2006 Water Master Study formed the basis of our well sampling and location study. In their report, Clear Creek Associates identified all known wells within an area bounded by Sarival Avenue, McDowell Road, Jackrabbit Trail, and Southern Avenue. CVL has adopted the data and map created by Clear Creek Associated by adding the WGCPA study area limits and associated development parcels. In addition, the service area limits of those providers servicing the area are shown. See Figure 6.

The criteria for selecting suitable wells for sampling were as follows:

- Wells are to be located north of Yuma Road. Wells located south of this road are known to have very high TDS and temperatures as established by past well development experience by the City.
- Wells would preferably not be located adjacent to the service area limits of other water service providers. Development of a well at this location would potentially impact the groundwater resources of the adjacent service provider necessitating the negotiation of a waiver and approvals/permits from ADWR and ACC (for a private water company).
- ADWR pumping history indicated that the well under consideration had a recent history of groundwater withdrawals and was currently registered as an active well.
- The well's owner could be located and permission obtained to enter the well site for the purpose of sampling. Should the well not be equipped with a well pump, obtain the owner's approval to engage the services of a well driller to install a portable well pump for drawing water from the casing.

Following a thorough investigation, CVL was able to identify three wells within or adjacent to the WGCPA that met the above criteria and were acceptable to the City as sampling wells and as a potential location for future potable water wells. See Figure 6.

- Well 607193 located on the northeast corner of Harrison Street and Citrus. Owned by the Roosevelt Irrigation District (RID).
- Well 605172 located one-quarter mile west of Cotton Lane south of McDowell Road, owned by the Roles RV Park.
- Well 608473 located on the southeast corner of McDowell Road and Citrus. Owned by the Arizona Department of Transportation (ADOT).

Sampling of the RID and Roles Well was performed in late May and early June 2012. (An entry permit necessary to access the site and sample the ADOT well was not received in time for this study and available ADWR water quality data has been obtained and is exported below.) The results are shown in Table 4 below:

Table 4 – Well Sampling Results

Contaminants	Well 607193 ¹	Well 600702 ²	Well 608473 ³	MCL
Arsenic	0.0020 mg/L	0.0026 mg/L	-	0.010 mg/L
Fluoride	ND (non detect)	ND	6.5 mg/L	4.00 mg/L
Nitrate – N	28 mg/L	18 mg/L	-	10 mg/L
TDS	2,400 mg/L	1,400 mg/L	804 mg/L ⁵	500 mg/L ⁴

¹ RID Well.

² Roles Well.

³ ADOT Well (results from 1982, ADWR imaged records).

⁴ City Standard, not a MCL.

⁵ A specific conductance of 1,200 $\mu\text{S}/\text{cm}$ was measured. A general conversion factor of 0.67 was used to convert the conductance to TDS [(TDS)ppm = Conductivity $\mu\text{S}/\text{cm}$ x 0.67].

See Appendix A for a copy of the lab results.

5.3 Discussion

The water quality data indicates that treatment will very likely be required to remove excess contaminants from the groundwater. The development of a potable water well at these locations will attempt to select aquifers with the highest water quality through a zonal sampling program. It is noted that high nitrate bearing aquifers may be avoided by the approximate distribution of casing perforations away from the shallow aquifers that are typically contaminated with nitrates. However, arsenic and TDS are likely to be found in the deeper aquifers that would be tapped for the development of a potable well.

The City has selected treatment technology known as SORB 33 for the removal of excess arsenic in groundwater. Trials are ongoing for the use of Layne RT media to replace the SORB 33 system. This new technology has the benefit of greatly reducing the costs of regenerating the media and appears to have a greater bed life before regeneration is required according to City Operations Staff.

The City has indicated that a Reverse Osmosis (RO) technology will be used to reduce TDS concentrations. This technology produces a waste stream equal to approximately 20 percent of the raw water inflow to the treatment system; that is, the production of one (1) gallon of treated water will require the introduction of 1.25 gallons of high TDS water through the treatment

process. The waste stream is highly saline, with typical TDS concentrations of 8,000 to 9,000 mg/L and is known as brine.

The City prohibits the discharge of any future brine discharge into its sewer collection system. The high salt content of the brine water impact the biological processes at the treatment plant by reducing treatment effectiveness. The brine water also adds a hydraulic load to the treatment plant pumping and process facilities occupying capacity that would otherwise be dedicated to treatable sewage waste streams. Approximately 0.5 MGD of treatment capacity at the 157th Avenue WWRF is currently brine wastage from existing RO treatment operations at City wells according to City Operations Staff. Lastly, brine wastewater is unaffected by the conventional biological treatment processes found at the 157th Avenue WWRF and will increase the salinity of the treated effluent, thereby reducing its value as reclaimed water for irrigation and other potential uses impacted by high TDS concentrations.

5.4 Brine Disposal

The disposal of brine generated from RO treatment is a challenging issue. The City of Goodyear has considered two disposal alternatives that are summarized in this report:

- Deep Well Injections.
- Evaporation Ponds.

Deep well injection of brine has been studied by the City and a report was prepared by CH2M Hill in 2007 to investigate this option. This alternative requires detailed and extensive hydrogeological studies and aquifer impact studies/monitoring to satisfy ADWR and ADEQ permitting requirements. The City considers deep well injection as a long term solution that is not currently being actively considered for immediate implementation.

Evaporation ponds for the disposal of brine wastes utilize the large deficit between annual precipitation and evaporation exhibited by the Sonoran Desert climate prevalent in south-central Arizona. Typical annual precipitation amounts of 8.2 inches are experienced in the Goodyear area compared to an annual evaporation of 72.0 inches. The difference between precipitation and evaporation, approximately 63.8 inches, indicates the theoretical amount of additional water that would be evaporated in a year. Precipitation, evaporation and brine water discharges are inputs to water balance calculations used to determine the basin area required to fully evaporate the brine water in a one-year cycle.

CVL has performed a preliminary water balance using WGCPA average day water demands and limiting accumulating depths at any time during the year to 2-foot depth maximum. The results are shown in Table 5, below.

The results indicate that an area of approximately 250 acres would be needed to dispose of the brine water generated when treating well water produced to meet all WGCPA demands. A factor of 1.25 was added to the area above to account for berming, access roads, and other site requirements for a total area of 310 acres.

The basin area may be configured as three separate basins to allow for the periodic dosing and rest cycles of each basin and allow for maximum operational efficiency in managing the

incoming brine volumes. All basins must be lined with an impermeable liner such as 60 mil nylon-reinforced HDPE geomembrane to protect the underlying aquifers from contamination. The residual accumulating salt and debris are to be removed and landfilled to an approved facility on a periodic basis.

Provisions must be made to pump brine waste from the treatment facilities to the evaporation basins. The delivery system would be designed on the basis of an MDD production of the RO system, approximately 1,400 gpm. The brine solution will be delivered to the evaporation basins in a pressure line of the appropriate diameter determined as part of a future siting study. A comprehensive study which is outside of the scope of this report must be performed to site this facility.

Table 5 – Annual Water Balance¹

	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
	# Days	31	28	31	30	31	30	31	31	30	31	30	31	365
Precipitation ²	In	0.80	0.90	0.90	0.30	0.10	0.10	0.70	1.00	1.00	0.60	0.70	1.10	8.20
	Ft	0.07	0.08	0.08	0.03	0.01	0.01	0.06	0.08	0.08	0.05	0.06	0.09	0.68
Evaporation ³	In	2.39	3.06	4.86	6.67	8.90	10.04	10.02	8.74	7.00	4.96	3.10	2.26	72.00
	Ft	0.20	0.26	0.41	0.56	0.74	0.84	0.84	0.73	0.58	0.41	0.26	0.19	6.00
Net Climate	Ft	-0.13	-0.18	-0.33	-0.53	-0.73	-0.83	-0.78	-0.65	-0.50	-0.36	-0.20	-0.10	-5.32
Wastewater Inflow/Depth	Ft	0.45	0.41	0.45	0.44	0.45	0.00	0.00	0.45	0.44	0.45	0.44	0.45	4.43
Net Water Depth	Ft	-	-	-	-	-	-	-	0.81	0.74	0.83	1.07	1.42	Year 1
Net Water Depth	Ft	1.74	1.97	2.09	2.00	1.72	0.89	0.11	0.00	0.00	0.09	0.33	0.68	Year 2
Net Water Depth	Ft	1.00	1.23	1.35	1.25	0.97	0.14	0.00	0.00	0.00	0.09	0.33	0.68	Year 3
Net Water Depth	Ft	1.00	1.23	1.35	1.25	0.97	0.14	0.00	0.00	0.00	0.09	0.33	0.68	Year 4

¹ Brine quantities calculated as 3,251 gpm (ADD) x 1.25 x 20% reject = 812.75 gpm or 1,170,000 gpd.

6.0 PROPOSED INFRASTRUCTURE

The proposed potable water infrastructure will consist of a system of water distribution mains, booster pump stations, pressure control valves, wells, storage tanks, and treatment facilities. The water distribution mains will follow the major street alignments. The booster pump stations will be designed to meet the greater of the maximum day demand plus fire flow or the peak hour demand. The storage tanks will supplement the source supply when demands exceed maximum day demand (i.e. peak hour and fire flow). Storage and booster pumps will be located on the same site, with perimeter screen walls to enhance aesthetics. The required treatment facilities will remove excess contaminants from the new water in accordance with regulatory water quality requirements and will be located at the storage site. The minimum line size modeled was 12-inch, owing to the conceptual level of planning detail known at this time.

Figure 5 shows the approximate locations of the potable water distribution piping system within arterial streets to serve as regional WGCPA mains. Waterlines within each development are not considered as these will be the particular developer's responsibility. The water mains necessary to serve the IDG properties are also shown and depict the mains necessary to provide service to these properties. Storage tanks, booster pump stations, and treatment required to meet West Goodyear demands will be located at the proposed Water Plant Facility. See Section 5.0 for a discussion of well water supply to the development. The final locations of the water distribution system may vary as the subdivision designs are completed and components of the distribution system are internalized.

All facilities will be compatible with the City's SCADA system.

6.1 Storage Reservoirs

In accordance with the design criteria established in Section 2.0, storage for the study area shall be the larger of the following:

- 25 percent of maximum day demand plus 3 hours of fire flow reserve (largest fire flow).
- 100 percent of average day demand.

Total storage volume required for the project is estimated to be 5.0 million gallons (MG) at ultimate buildout. The Zone 1 will require 2.5 MG storage and the Gila River Zone will require 2.5 MG storage. All storage for both zones will be located at the West Goodyear WTF. The City requires storage reservoirs to be built in 0.5 MG increments with 1.0 MG being the minimum size. Tables 6a through 6c show the storage required for ultimate buildout of the WGCPA.

Table 6a summarizes the storage requirements of the IDG Development Properties. Volumes were calculated as outlined in Section 2.0.

Table 6a - Storage Requirements for IDG Properties

Pressure Zone	Max Day Demand (gpm)	25% Max Day Demand (gpm)	Fire Flow Demand ¹ (gpm)	25% MDD + FF Storage (MG)	Average Day Demand (gpm)	ADD Storage (MG)	Calculated Storage (MG)	City Required Storage (MG)
1	1,605	401	3,000	1.17	944	1.36	1.36 ²	1.5
Gila River	1,806	452	3,000	1.19	1,063	1.53	1.53 ²	2.0
Total	-	-	-	-	-	-	2.89	3.0

¹ Fire flow demand assumed to be 3,000 gpm for Commercial & Industrial land use. Storage is for 3 hours.

² The Average Day Demand requirement governs.

Table 6b – Storage Requirements for Additional Development Properties

Pressure Zone	Max Day Demand (gpm)	25% Max Day Demand (gpm)	Fire Flow Demand ¹ (gpm)	25% MDD + FF Storage (MG)	Average Day Demand (gpm)	ADD Storage (MG)	Calculated Storage (MG)	City Required Storage (MG)
1	1,094	273	3,000	0.93	643	0.93	0.93 ²	1.0
Gila River	1,022	255	3,000	0.91	601	0.87	0.91 ²	1.0
Total	-	-	-	-	-	-	1.84	2.0

¹ Fire flow demand assumed to be 3,000 gpm for Commercial & Industrial land use.

² The 25% MDD + 3 hours fire flow requirement governs.

Table 6c – Total Storage Requirements for WGCPA Study Area

Pressure Zone	Max Day Demand (gpm)	25% Max Day Demand (gpm)	Fire Flow Demand ¹ (gpm)	25% MDD + FF Storage (MG)	Average Day Demand (gpm)	ADD Storage (MG)	Calculated Storage (MG)	City Required Storage (MG)
1	2,698	675	3,000	1.51	1,587	2.29	2.29 ²	2.5
Gila River	2,828	707	3,000	1.56	1,663	2.40	2.40 ²	2.5
Total	-	-	-	-	-	-	4.473	5.0

¹ Fire flow demand assumed to be 3,000 gpm for Commercial & Industrial land use.

² The Average Day Demand requirement governs.

[Storage is recalculated in Table 6c using the established criteria.]

The total storage for the WGCPA area will be provided at the future West Goodyear WTF. This facility will be located in Zone 1 but will provide water to Zone 1 and the Gila Zone. Supply wells for the WGCPA area planned in the northern portion of the area near the future WTF site. A dedicated supply line and separate booster pumps will be installed to supply the Gila Zone from this location.

6.2 Water Plants and Booster Pump Stations

A water plant is required to provide adequate potable water flows and pressures to the project at ultimate buildout within their respective zones. Each zone will be served by a dedicated booster pump system drawing from a combined storage reservoir.

The following facilities will be provided at the water plant sites:

- Booster pumps (one for each zone)
- Water Reservoir Storage – Depressed Steel Tanks
- Hydropneumatic tank and appurtenances
- Pressure reducing valves - (100 percent PLC controlled and monitored)
- Chlorination equipment
- Electrical equipment and controls including variable frequency drives
- Instrumentation equipment
- Masonry screening wall and landscaping
- Emergency electrical generator
- Electrical/control and chlorine buildings to match adjacent architecture
- Water treatment (as necessary) to remove excess containments and/or TDS
- Controls for well, treatment, PRV, and booster pump station shall be compatible with COG's SCADA system.

The booster pump stations at the water plants will be designed in accordance with City of Goodyear requirements. It will include a firm pump capacity that shall meet the larger of maximum day plus fire flow or peak hour demands. Tables 7a through 7c summarize the booster pump station pumping capacities for each pressure zone contained within the WGCPA.

When looking at the IDG properties only (Table 7a) and at the Additional Development properties only (Table 7b) the combined booster pump requirement appears greater than when looking at the totals for all properties. The requirements are to provide the larger of maximum day plus fire flow or peak hour demands. When the demands are smaller, for example when only looking at the IDG properties or the Additional Development properties, the governing number is the maximum day plus fire flow (3,000 gpm). When the demands are larger, for example when looking at the total WGCPA properties, the governing number is the peak hour demand.

Table 7a - Booster Pump Station Capacity for IDG Properties Only

Site	Pressure Zone	Peak Hour Demand (gpm)	Maximum Day Demand ¹ + Fire Flow (gpm)	Firm Pump Capacity ² (gpm)
West Goodyear WTF	1	2,728	4,605	4,610
	Gila River	3,071	4,806	4,810
	Total			9,420

¹ Commercial/ Industrial Fire Flow = 3,000 gpm

² Assuming largest pump out of service

Table 7b – Booster Pump Station Capacity for Additional Development Properties Only

Site	Pressure Zone	Peak Hour Demand (gpm)	Maximum Day Demand ¹ + Fire Flow (gpm)	Firm Pump Capacity ² (gpm)
West Goodyear WTF	1	1,859	4,094	4,100
	Gila River	1,737	4,022	4,030
	Total			8,130

Table 7c – Water Plant Booster Pumping Capacity Requirements

Site	Pressure Zone	Peak Hour Demand (gpm)	Maximum Day Demand ¹ + Fire Flow (gpm)	Firm Pump Capacity ² (gpm)
West Goodyear WTF	1	4,587	5,698	5,700
	Gila River	4,807	5,828	5,830
	Total			11,530

The water plant for both pressure zones will be located in Development Property No. 5 (Citrus and Van Buren 160) at the NEC. Citrus and Harrison Street on property acquired by the City for that purpose. Gila zone dedicated booster pumps and a dedicated 24-inch supply line along Citrus Road from Harrison to Lower Buckeye Road will be installed to serve the Gila Zone. Table 8 presents the future operating pressures at the water plant.

If required, individual PRV's shall be installed at each dwelling unit where pressure will exceed 80 psig subject to the City's approval. The dwelling units that require individual PRV's are not specified within this report but will be determined during final design for each subdivision.

Pressure zones and pump station data have been incorporated in the model as outlined in the IWMP. Pressures exceed 80 psi for approximately 2,000 dwellings. It is recommended the City revisit the IWMP recommendations regarding the pressure zone boundaries and/or HGL criteria.

The pump station pressure data may be reviewed during design to refine the system pressures. It is noted that grading plans for this area are not available at this time and an accurate assessment of system pressures cannot be made until final parcel topography is known.

Table 8 - Booster Pump Station Pressure Data

Zone	Plant	Item	Value, ft MSL
Zone 1	West Goodyear WTF	Base Elevation	1,010
		Upper Zone HGL (static) ¹	1,165 (67 psi)
Gila Zone	West Goodyear WTF	Base Elevation	929
		Upper Zone HGL (static) ¹	1,100 (74 psi)

¹ HGL = hydraulic grade line.

6.3 Well Capacity

The proposed well production capacity to serve the WGCPA is shown in Table 9 below and is calculated using the City's design criteria described in Section 2.3.1 of this report.

Table 9 – Well Production Capacity

	Average Daily Demand	Net Well Production	Gross Well Production ¹
Zone 1	2,698 gpm	3,507 gpm	4,384 gpm
Gila River	1,663 gpm	2,162 gpm	2,702 gpm
<i>Total</i>	<i>4,361 gpm</i>	<i>5,669 gpm</i>	<i>7,086 gpm</i>

¹ Assuming high TDS and RO treatment that removes 20 percent of production waster as brine waste. That is, gross well production = net well production x 1.25.

The number of wells required to meet the gross production requirements shown in Table 9 above are calculated assuming a well yield of 1,200 gpm for each well.

$$\# \text{ Wells} = 7,086 \div 1,200 \text{ gpm/well or } 5.9 \text{ say } 6 \text{ wells.}$$

The number of wells required to meet WGCPA production demands will vary with well pumping rates. A lower well yield will result in the need for additional wells, larger well yields will result in fewer wells.

The three (3) existing well sites and the proposed location of three (3) additional wells to serve the WGCPA are shown in Figures 6 and 8. These will provide groundwater to the proposed water reservoir to be located on the northeast corner of Harrison Street and Citrus Road (West Goodyear WTF) through a system of raw delivery water mains. All wells will be sited within the City's service area. This water will be treated (if required) and disinfected prior to its storage on-site. A booster pump station will pressurize the water to system pressures identified in Table 9. Figure 8 illustrates the proposed well delivery system.

A well located just east of the intersection of Cotton Lane and I-10 is owned by Sunbelt Holdings, a member of the IDG. Additional groundwater resources may be made available to the City by extending a raw water delivery line to Site 21 upgraded to receive this additional

water for discharge into the existing City distribution system. It is anticipated that this well will produce up to 1,200 gpm as reported by the well's owner. Water delivered and stored at the West Goodyear WTP Site could contribute to the IDG's production and storage requirements as stipulated by the MOU with the City.

We note that this well is within the Liberty Utility Company's (Litchfield Park Service Company) service area; however, preliminary discussions with the Liberty Utility Company have indicated a willingness to consider the sale of water to the City in a manner similar to that of COG's agreement with the Adaman Mutual Water Company. Acceptance of water from the Liberty Utility Company is contingent on a variety of factors which will have to be evaluated.

This report provides a conceptual plan for developing a well system to provide potable water necessary for the development of the properties within the study limits. Alternatives such as developing a system to convey CAP allotments to the City, the use of additional water in the Adaman Service Area, and/or the Liberty service area have also been identified as potential future sources to supply all or a portion of the water required for this area.

6.4 Reclaimed Water Impacts

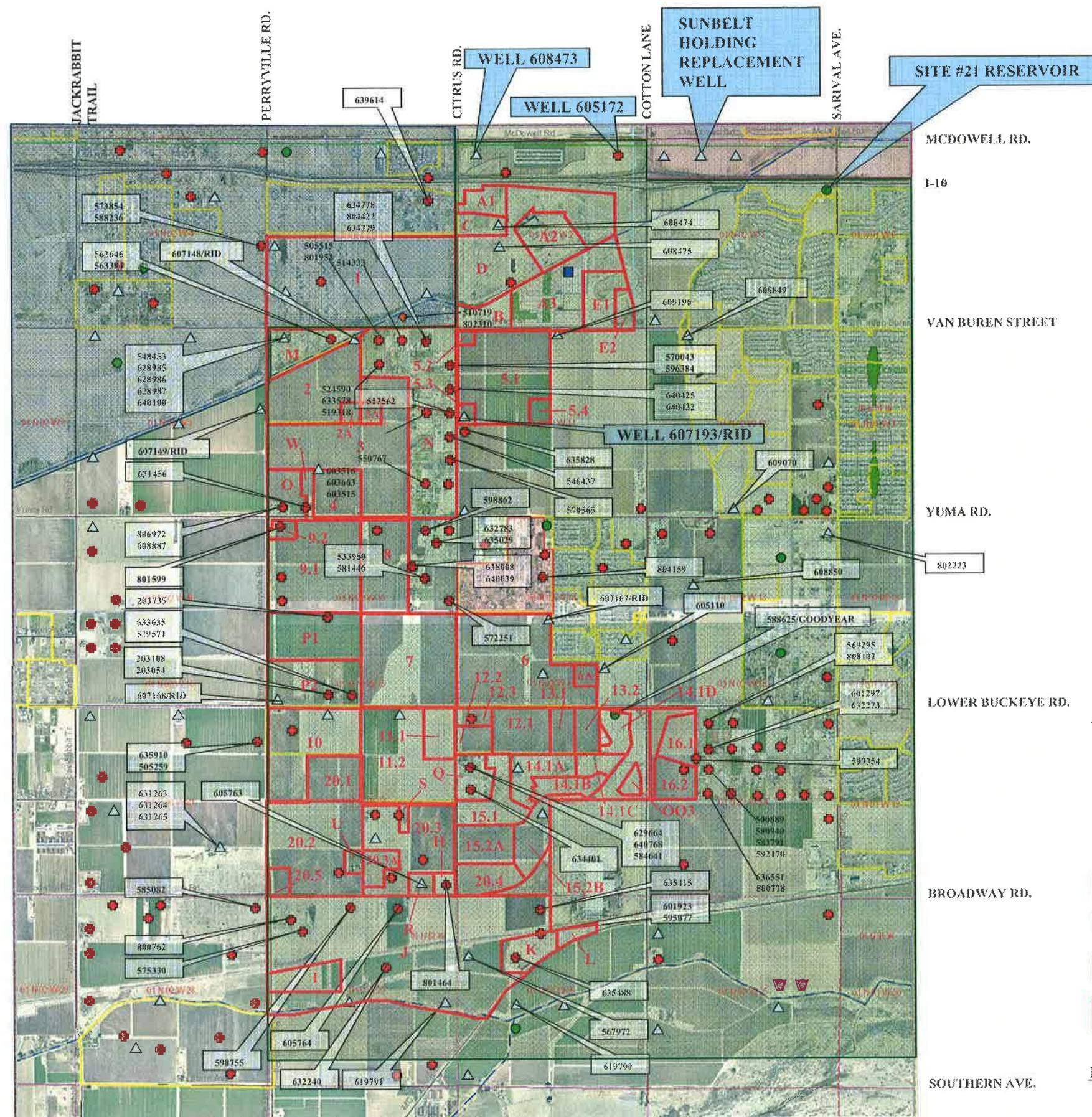
The City's reclaimed water system will be built over time but will not be complete until full buildout. The necessary conveyance facilities may not be available to meet a particular development's irrigation demands prior to full buildout. Irrigation demands may be met through the potable water system. The City will require that the potable water supply be increased to meet these demands on an interim basis. Individual developments will be required to prepare water studies to address these issues and identify a water supply solution for implementation.

6.5 Surface Water Sources

The City undertook a study to develop its 18,485 AF (16.5 MGD) CAP allocation by participating in the construction of a Surface Water Treatment Plant (SWTP) with other West Valley providers in 2004-2005. The SWTP would be located near Camelback Road and the Beardsley Canal and a 30-inch pipeline extended south, along Citrus Road, to serve as a delivery conduit to the City system connecting with an extended City transmission system south of I-10. The study's conclusions were that the implementation of this solution was not in the City's best interest at that time (2006).

CVL notes that the first phase of a SWTP at the above-designated location was designed and constructed by Arizona American Water (now EPCOR) and has been online since 2010, producing up to 12 MGD of treated water.

It is recommended that the City review its options to treat a portion of its allocation of CAP water at the EPCOR SWTP through the funding of an expansion of the facility. A treated water transmission main from the SWTP to the City's water service area would be installed and connected to a reservoir provided at the proposed West Goodyear WTF to provide service to the WGCPA. A cost benefit analysis comparing the drilling and treatment of new wells versus constructing a surface water treatment facility would define the optional first phase production volume of this alternative.



LEGEND:

- △ Irrigation
- Domestic
- Industrial
- Municipal
- ◆ Commercial
- ▽ Drainage

- CITY OF GOODYEAR
- VALENCIA WATER COMPANY, INC.
- ARIZONA WATER COMPANY (WHITE TANKS)
- LITCHFIELD PARK SERVICE COMPANY
- DEVELOPMENT PARCEL

WELL 802223

SAMPLING WELL

607193/RID

ADWR WELL
REGISTRATION NUMBER

DATA SOURCE: ADWR Well Registry Database (ADWR 2004)
Clear Creek Associates, Inc. (August 2005)

Well inventory does not include test wells, geotechnical wells, monitor wells, abandoned or cancelled wells.

**WEST GOODYEAR
CENTRAL PLANNING AREA**

COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

EXISTING WELL LOCATIONS

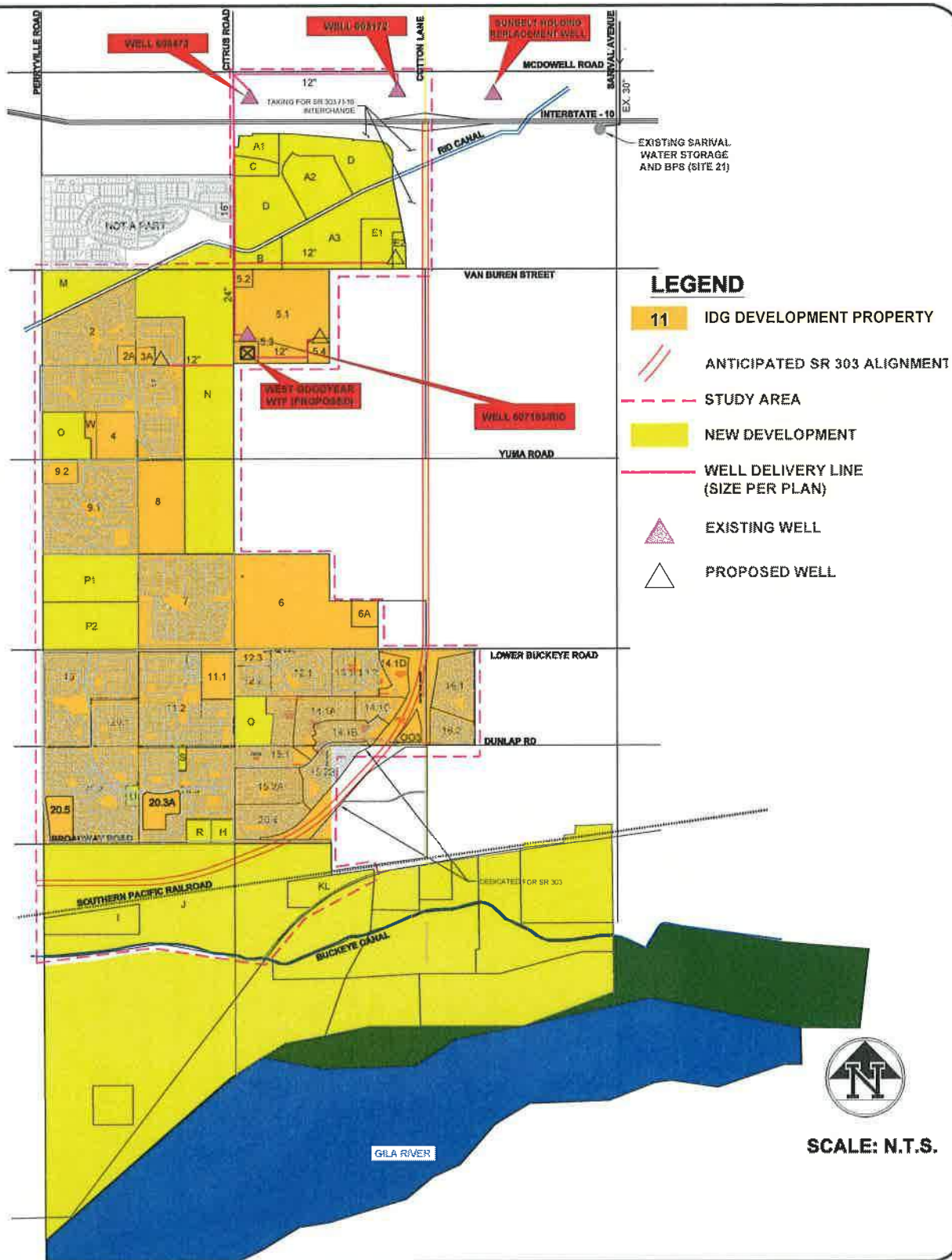
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6631

JOB NO
1.07.0112705

FIGURE

6

N:\070112705\Enviro\CADD\Goodman Master Water Study\WaterSupply\Map\Map.dwg Envrns Mar 19, 2014 3:20pm



WELL DELIVERY SYSTEM

4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

MASTER WATER STUDY

COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

JOB NO

1.07.0112705

FIGURE

8

7.0 WATER SYSTEM MODELING

The network analysis for the proposed WGCPA water distribution system was analyzed by Tata & Howard using WaterCAD Software, version 7.0 by Haestad Methods as a standalone system. The analysis was used to determine the size of water mains necessary to meet ultimate build out demands of the WGCPA. Inputs from this model enabled CVL to determine the water resources necessary to meet the WGCPA properties development.

The layout of the proposed distribution system for the service area is shown in Figure 5.

7.1 General Plan for WGCPA Water System

The WGCPA developments will be served by a proposed water plant and booster pump station, through potable water wells, and a distribution system consisting of 12-inch, to 24-inch potable water lines. The Study area extends into two pressure zones, Zone 1 to the north and the Gila Zone to the south (see Figure 7).

The Zone split will be achieved by making the following modifications to the water system:

- A dedicated supply line will serve the Gila Zone from the West Goodyear WTF.
- Closed valves or pressure reducing valves (PRV) will be placed on north-south aligned pipes just north of Lower Buckeye Road in Perryville Road, Citrus Road and South 173rd Avenue
- A PRV will be placed on the 8-inch pipe in South 169th Avenue just south of Lower Buckeye.
- It will be necessary to install a zone valve on the existing 16-inch waterline in Lower Buckeye Road, just west of the 173rd Avenue 24-inch main intersection. This will allow for the Site 12 water plant to push water to Lower Buckeye Road, east and south to Cotton Lane as is currently performed.
- A future 12-inch line will extend from the Gila Zone 16-inch main in Lower Buckeye Road to the proposed internal El Cidro water distribution system to establish a looped connection.
- The future extension of 12-inch waterlines along Dunlap Road, from Cotton Lane, west, will not connect to the existing 16-inch Cotton Lane transmission main to maintain the zone separation. This will allow for the looped feed to parcel 16, located east of cotton Lane.

Figure 7 shows all these proposed improvements. See discussion in Tata & Howard report, Appendix C.

Supply for the potable water system will be from wells or other off-site water sources that will be located on-site and off-site the WGCPA study area. A proposed 5.0 MG storage facility will be located at the West Goodyear WTF Site (Citrus Road and the West Harrison Street alignment). These facilities will provide adequate supply and storage for build out of the WGCPA developments.

7.2 Network Analysis – Ultimate Phase

The network analysis for the distribution system was completed using WaterCAD version 7.0. A model was created and modified as necessary to demonstrate that the water infrastructure meets the water system design criteria. The network distribution systems are shown in Figure 5. The network was analyzed for average day, maximum day, peak hour and maximum day plus fire flow demand conditions. Demands were allocated to the nodes based on the proposed lotting shown in Figure 3. See Appendix B for a table showing how the demands of each parcel were assigned to each node. Residential fire flow (1,500 gpm) and School or commercial fire flow (3,000 gpm) were assigned to each appropriate node independently to verify available pressure and flow for the system during a fire flow event. Hydraulic grade lines (HGL) shown in Table 8 were used for the reservoirs supplying the distribution system.

The pipes were sized based on pressure requirements for average day, maximum day, peak hour and maximum day plus fire flow, as described in Section 2.0.

Input parameters of the water distribution system modeling include:

- Pipe Diameters (inches).
- Elevations of nodes/junctions (feet).
- System Water Demands (gpm).
- Residential and Commercial/School fire flows = 1,500 gpm and 3,000 gpm, respectively.
- Hazen-Williams, $C=130$.

Output parameters include but are not limited to:

- Velocities (fps).
- Pressure (psig).
- Head Loss (feet).
- Flow Rates (gpm).

7.2.1 Modeling Results

Figure 5 presents the water distribution system including node locations, pipe locations and pipe sizes for the Ultimate distribution system, see Appendix D. For the Tata & Howard WaterCAD results performed on August 30, 2012. These were updated on December 10, 2012, to reflect additional analysis performed to completely separate the Gila and Zone 1 pressure zones while providing an emergency interconnection between the zones through PRVs, see Appendix C. Tables 10 and 11 summarize the results for each demand scenario from Tata & Howard's recommended alternative (Alternative 3).

Table 10 - Results of WaterCAD Analysis for Ultimate Buildout (Zone 1)

Scenario	Flow (gpm)	Pressure (psig)				Maximum Velocity (fps)	Pipe ID
		Minimum	Node	Maximum	Node		
Average Day	2,000	60	22876	97	J3208	1.41	P1749
Maximum Day	3,660	59	22876	97	J3208	2.40	P1749
Peak Hour	5,750	57	22876	95	J3208	4.08	P1749
Maximum Day + Fire Flow ¹	5,698	35	22876	-	-	-	-

¹ Minimum pressures occur during a commercial fire flow event of 3,000 gpm.

The location of nodes may be found in Tata & Howard's nodal figure. The equivalent CVL node shown in Figure 5 has been added, if one exists.

Table 11 - Results of WaterCAD Analysis for Ultimate Buildout (Gila Zone)

Scenario	Flow (gpm)	Pressure (psig)				Maximum Velocity (fps)	Pipe ID
		Minimum	Node	Maximum	Node		
Average Day	1,600	63	23998 (CVL 32)	87	22824 (CVL 53)	1.13	P1751
Maximum Day	2,440	62	23998 (CVL 32)	86	22824 (CVL 53)	1.73	P1751
Peak Hour	4,650	57	23998 (CVL 32)	79	22824 (CVL 53)	3.30	P1751
Maximum Day + Fire Flow ¹	5,828	35	22876	-	-	-	-

¹ Minimum pressures occur during a commercial fire flow event of 3,000 gpm.

The results indicate that the proposed water distribution system infrastructure will deliver water at acceptable flows and pressures to the WGPCA properties subject to the following:

- No areas in the pressure zones drop below 40 psi during average day, maximum day, and peak hour conditions.
- The pressure on pipes in arterial streets does not drop below 20 psi during fire flow conditions.
- Zone 1 areas located downgradient of the 980-foot contour may experience pressures in excess of 80 psi and would require individual household PRVs. The IWMP in its discussion of maximum pressures has allowed for the elevation range between pressure zone limits to be 100 feet, resulting in elevated pressures along the lower boundary of each zone. (See discussion in IWMP Page 5-17 and Table 5-10.)
- Gila River Zone areas located downgradient of Broadway Road may experience pressures in excess of 80 psi and would require individual household PRVs. The IWMP in its discussion of maximum pressures has allowed for the elevation range between pressure zone limits to be 100 feet, resulting in elevated pressures along the lower boundary of each zone. (See discussion in IWMP Page 5-17 and Table 5-10.)

- Adjustment of the base HGLs for the two zones under study may be considered to reduce the anticipated areas of high pressure to 80 psi. That is, a reduction of approximately 20 feet (8.5 psi) for Zone 1 and 35 feet (15.0 psi) for the Gila Zone. Adjusting the HGLs would cause this area to not be compatible with the zones established in the IWMP, however. We note that these results were derived from the City's distribution system model currently in force.

8.0 COST ANALYSIS

CVL has calculated costs for the implementation of the Ultimate water system improvements described in this report. Costs were obtained from actual bidding results for elements of the work installed, available bid data from similar projects designed by CVL, budgetary quotes from material and equipment vendors, and recent estimates for projects in the Phoenix area. We note that the estimates shown below are subject to change owing to local, national and international pressures on materials, energy and services.

8.1 Ultimate System

The water facilities included in this estimate are shown in Figures 5 and 6 and are listed below:

- Water Production Wells with options to obtain off-site groundwater or for wells and surface water sources.
- Raw or Finished Water Transmission Lines.
- Storage at Citrus Road and Harrison Street (West Goodyear WTF Site).
- Booster Pump Stations for Zone 1 and Gila Zone pressure zones.
- Water treatment to remove excess Arsenic, Nitrates, or TDS as defined by a water quality assessment of the source water.

The costs of delivery/distribution mains and reclaimed lines shall be borne by each WGCPA Property as those properties are developed and are not included in this estimate. However, repayment for oversizing from other WGCPA properties will be addressed in the CRO.

See Table 12 for a cost breakdown of the Ultimate System Costs of \$33,201,598 of which 63 percent is attributable to IDG and 37 percent to other developers as determined on a gross acreage basis. A cost per EDU has been calculated to determine the proportional share of all land uses in the water infrastructure improvements. Costs were allocated based on equivalent dwelling units (EDUs). Tables 12a and 12b list the allocation of EDUs by property. This estimate has been calculated assuming that all production will be met by wells and that brine treatment of RO reject water would be accomplished by evaporation ponds.

8.2 Cost Recovery Ordinance Amendment

The allocation of costs to install the required water system improvements between the participating parties of the IDG was documented in a Cost Recovery Ordinance (CRO) implemented by the COG in 2006. In this update to the 2006 water master plan, it is noted that portions of the recommended water infrastructure improvements were installed by certain IDG participants since 2006. These mains are identified in Figure 5.

A reallocation of costs to each participating property for the installation of the remaining future water system improvements has become necessary as a result of the installation of water mains under the 2006 CRO. This reallocation has been performed and is presented in this report. We note that the original CRO must be amended by COG to accurately reflect the revised allocations of water system improvement costs.

Table 12 – Opinion of Probable Construction Costs

Item	Description	Units	Quantity	Unit Cost	Total Cost	Remarks
1	Combined Zonal Reservoir	GAL	4,600,000	\$1.25	\$5,750,000	Assume aboveground steel tank with chlorination and walled enclosure
2	Zone 1 Booster Pump Station	GPM	6,996	\$250	\$1,749,000	Assume located at reservoir site
3	Gila Zone Booster Pump Station	GPM	4,785	\$250	\$1,196,250	Assume located at reservoir site
4	24" Gila Zone Delivery Line	LF	8,000	\$125	\$1,000,000	From West Goodyear WTF
5	12" Well Lines	LF	16,000	\$60	\$960,000	C 900 PVC pipe
6	16" Well Lines	LF	5,280	\$100	\$528,000	C 905 PVC pipe
7	24" Well Lines	LF	2,600	\$125	\$325,000	C 905 PVC pipe
8	Water Production Wells	EA	6	\$1,750,000	\$10,500,000	Assumes 1200 gpm per well in walled enclosure
9	Raw Water BPS at Site 21	EA	2,400	\$250	\$600,000	For 2 Adaman Wells
9	Treatment ***	\$/Kgal	8,640,000	\$400	\$3,456,000	Assume treating all 6 wells at 1,200 gpm per well
***Treatment includes TDS Removal (RO), Chemical Stabilization, Arsenic Treatment Brine disposal costs not included.						
				Subtotal	\$26,064,250	
				16% Contingency	\$4,170,280	
				Engineering & Administration (6%)	\$1,563,855	
				Tax & Bond Fee (5%)	\$1,303,213	
				Land Acquisition	\$100,000	2 acres for well sites at \$50,000/acre
				Total	\$33,201,598	
				# EDU	12,002	
				Cost/EDU	\$2,766	

Table 13a – IDG Properties EDU

Area ID	IDG Development Group Properties	Land Use	Area (acres)	Average Demand (gpd)	EDU ¹
1	Not a Part	-	-	-	
2	Amber Meadows	Single Family	102	114,270	293
2A	Amber Meadows School	School	6	13,440	34
3	La Privada	Single Family	194	221,910	569
3A	La Privada School	School	6	13,440	34
4	Paseo Ridge Phase II	Single Family	40	44,460	114
5.1	Silva-Rose Gardens	Single Family	135	149,760	384
5.2	Silva-Rose	Commercial Pad	7	14,231	36
5.3	Silva-Rose Gardens	City Water & Fire Campus	10	21,780	56
5.4	Silva-Rose Gardens	Charter School	8	17,424	45
6	La Jolla Vista	Single Family	188	269,100	690
6A	La Jolla Vista School	School	12	26,880	69
7	Pradera	Single Family	160	177,840	456
8	Paseo Ridge Phase I	Single Family	80	83,460	214
9.1	las Ventanas Single Family	Single Family	145	160,680	412
9.2	las Ventanas	Commercial Pad	15	30,495	78
10	Las Brisas Phase I	Single Family	120	126,360	324
11.1	Levinson	Commercial Pad	27	54,891	141
11.2	Levinson	Single Family	133	164,580	422
12.1	Citrus Ridge	Agua Fria HS District	50	108,900	279
12.2	Citrus Ridge (R1-6)	Single Family	19	28,800	74
12.3	Citrus Ridge (C2)	Commercial Pad	8	17,098	44
13.1	Cotton Commons (MHD)	Multi-Family	20	76,800	197
13.2	Cotton Commons (MD)	Multi-Family	20	45,600	117
14.1a	El Cidro Ranch	Single Family	38	50,700	130
14.1b	El Cidro Ranch	Single Family	28	40,950	105
14.1c	El Cidro Ranch	Single Family	18	21,450	55
14.1d	El Cidro Ranch	Multi Family	18	50,730	130
15.1	El Cidro Ranch	Single Family	48	63,960	164
15.2a	El Cidro Ranch	Single Family	42	62,790	161
15.2b	El Cidro Ranch	Single Family	39	50,880	130
16.1	El Cidro Ranch	Single Family	42	54,600	140
16.2	El Cidro Ranch	Single Family	24	36,660	94
20.1	Las Brisas Phase 2	Single Family	40	43,290	111
20.2	Las Brisas Phase 2	Single Family	150	162,414	416
20.3	Las Brisas Phase 2	Single Family	131	141,842	364
20.3 A	Las Brisas Phase 2 School	School	17	37,184	95
20.4	El Cidro Ranch	Single Family	38	50,560	130

Area ID	IDG Development Group Properties	Land Use	Area (acres)	Average Demand (gpd)	EDU ¹
20.5	Las Brisas Phase 2	Commercial Pad	19	39,034	100
Sub Total			2197	2,889,242	7,408

¹EDU = Average Daily Demand/390 gpd, demand factor for low density SF land use.

Table 13b – Additional Development Properties EDU

Area ID (ID)	Land Use	Area (acres)	Average Demand (gpd)	EDU ¹
A1	Light Industrial	10	17,420	45
A2	Light Industrial	50	87,100	223
A3	Light Industrial	71.59	124,710	320
B	Community Commercial	20	40,660	104
C	M-HDR Multi-Family	10	38,400	98
D	Community Commercial	116	235,828	605
E1	M-HDR Multi-Family	20	76,800	197
E2	Community Commercial	5	10,165	26
H	LDR Single Family	10	11,700	30
I	Community Commercial	40	81,320	209
J	County Land-Light Industrial	370	644,540	1,653
K	Community Commercial	20	40,660	104
L	Community Commercial	7	14,231	36
M	County Land-RR	45	19,980	51
N	County Land-RR	250	111,000	285
O	County Land-LDR	30	35,100	90
OO3	Community Commercial	8.22	16,711	43
P1	County Land-LDR	75	87,750	225
P2	County Land-RR	75	33,300	85
Q	County Land-LDR	30	35,100	90
R	County Land-LDR	10	11,700	30
S	LDR	3	3,510	9
U	LDR	5	5,850	15
W	LDR	7	8,190	21
Sub Total		1288	1,791,725	4,594

¹EDU = Average Daily Demand/390 gpd, demand factor for low density SF land use.

Grand Total of Service Area	3485	4,680,967	12,002
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8.3 Funding of Proposed Infrastructure Analysis

As previously discussed in this report, WGCPA arterial water mains will be constructed by various private developers as necessary as each of the participating projects in the service area is developed. The participating property owners for the planned projects are identified in Figure 3. The required water main improvements to serve these IDG Properties as identified in the CRO is shown in Figure 7. Note that certain water mains have been previously installed by IDG participants under the 2006 CRO. The current estimate of gross acreage for each participating development to be served by the proposed water system improvements is 2,197 acres of which 100 percent is attributable to the IDG and 0 percent to other developers. This report quantifies each participating developer's proportionate responsibility to finance the water works in Table 13. The City will administer a Cost Recovery Ordinance (CRO) for the WGCPA properties to reimburse the participating developers who install these water mains of all costs in excess of that developer's proportional responsibility based on area for designing and installing the various segments of water infrastructure shown in Figure 7.

The WGCPA's developing property owners identified in Figure 3 will proportionally share in the costs of the water mains shown in Figure 7 through the CRO as reimbursements to the installing developer. This share is determined by calculating the ratio of each property's (see Figure 3) gross acreage to the acreage of the participating developments. Table 13 shows each developer's responsibility for the installation costs of the water main under consideration expressed as a percentage of the water main's total cost. For example, El Cidro Ranch is responsible for contributing only 14.07 percent of the costs of water mains "A" and "B1" and 12.50 percent of main "I" because its contributing acreage in "A" and "B1" is a greater fraction of the total area serviced than those for line "I". It may also be noted that there are fewer participating developers dependent on "I" when compared to "A" and "B1" and that the construction costs would be shared between fewer parties, each party having therefore a larger share of the costs of constructing "I".

Each developer's responsibility for water main costs is shown as a percentage in Table 14. As various segments of the water system are constructed and approved, the installing property shown in Figure 3 will file for compensation in accordance with the requirements of the Reimbursement Agreement under the CRO. The participating property owners shown in Figure 3 will be asked to contribute to the reimbursement of the installing property's costs by an amount to be shown as a cost figure calculated from the percentages presented in Table 13. These costs were originally determined from estimates developed by CVL for each segment as part of the 2006 CRO and Water Master Study.

TABLE 13

West Goodyear Central Planning Area - Master Water Study: Percentage Allocation Cost Recovery Matrix												
March 21, 2014			TRUNK LINE DESCRIPTIONS									
			A	B1	C	D	E	F	G	H	I	J
			Lower Buckeye	Citrus	Van Buren	Van Buren	Yuma	Yuma	L. Buckeye	L. Buckeye	Citrus	Citrus
	Project Name	Estimated Area	Citrus to 173rd Ave.	L.Buckeye to Yuma	Citrus to 175th	Citrus to 183rd	Citrus to 183rd	183rd to Perryville	Citrus to 183rd	183rd to Perryville	L. Buckeye to Elwood	Elwood to Broadway
			\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
2	Amber Meadows	108			14.40%	18.31%	18.31%	27.55%				
3	La Privada	198			26.40%	33.56%	33.56%					
4	Lees	44			5.87%	7.46%	7.46%	11.22%				
5	Silva	160			21.33%							
6	La Jolla Vista	200	13.47%	13.47%								
7	Pradera	160	10.77%	10.77%					19.51%			
8	Van Leeuwen	80			10.67%	13.56%	13.56%	20.41%				
9	Las Ventanas	160			21.33%	27.12%	27.12%	40.82%				
10	Las Brisas Phs 1	120	8.08%	8.08%					14.63%	24.00%	12.50%	20.40%
11	Levinson	160	10.77%	10.77%					19.51%		16.50%	
12	Citrus Ridge	80	5.39%	5.39%							4.00%	
13	Cotton Commons	40	2.69%	2.69%								
14	El Cidro Ranch	209	14.07%	14.07%							21.00%	9.00%
15	Citrus Road 60	60	4.04%	4.04%							6.50%	6.30%
16	Cotton Lane 76	76	5.12%	5.12%								
20	Las Brisas 2	380	25.59%	25.59%					46.34%	76.00%	39.50%	64.30%
			100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	Grand Total	2,235										
	Total area contributing to the water main segment		1485	1485	750	590	590	392	820	500	1009	769

TABLE 14

West Goodyear Central Planning Area - Master Water Study: Cost Recovery Matrix													
March 21, 2014				TRUNK LINE DESCRIPTIONS									
				A ¹	B1 ¹	C	D	E	F	G	H	I	J
				Lower Buckeye	Citrus	Van Buren	Van Buren	Yuma	Yuma	L. Buckeye	L. Buckeye	Citrus	Citrus
				Citrus to 173rd Ave.	L. Buckeye to Yuma	Citrus to 175th	Citrus to 183rd	Citrus to 183rd	183rd to Perryville	Citrus to 183rd	183rd to Perryville	L. Buckeye to Elwood	Elwood to Broadway
Project Name				Estimated Area	Total Developer Costs								
					\$	\$	\$	\$	\$	\$	\$	\$	\$
2	Amber Meadows	108	\$355,319			\$72,661	\$83,829	\$79,370	\$119,460				
3	La Privada	198	\$432,409			\$133,212	\$153,686	\$145,511					
4	Lees	44	\$144,760			\$29,603	\$34,153	\$32,336	\$48,669				
5	Silva	160	\$107,646			\$107,646							
6	La Jolla Vista	200	\$230,647	\$79,827	\$150,820								
7	Pradera	160	\$269,121	\$63,862	\$120,656					\$84,604			
8	Van Leeuwen	80	\$263,199			\$53,823	\$62,095	\$58,792	\$88,489				
9	Las Ventanas	160	\$526,399			\$107,646	\$124,191	\$117,585	\$176,977				
10	Las Brisas Phs 1	120	\$448,556	\$47,896	\$90,492					\$63,453	\$104,063	\$54,199	\$88,453
11	Levinson	160	\$340,664	\$63,862	\$120,656					\$84,604		\$71,543	
12	Citrus Ridge	80	\$109,603	\$31,931	\$60,328							\$17,344	
13	Cotton Commons	40	\$46,129	\$15,965	\$30,164								
14	El Cidro Ranch	209	\$371,104	\$83,419	\$157,607							\$91,055	\$39,023
15	Citrus Road 60	60	\$124,694	\$23,948	\$45,246							\$28,184	\$27,316
16	Cotton Lane 76	76	\$87,646	\$30,334	\$57,312								
20	Las Brisas 2	380	\$1,418,765	\$151,671	\$286,558					\$200,934	\$329,531	\$171,270	\$278,801
Total Built To Date					\$2,854,214								
Total To Be Built					\$2,422,449								
Total					\$5,276,663	\$592,716	\$1,119,838	\$504,591	\$457,954	\$433,594	\$433,594	\$433,594	\$433,594
Grand Total				2235									
Total area contributing to the water main segment						1485	1485	750	590	590	392	820	500
												1009	769

TRUNK LINE DESCRIPTIONS									
A	B1	C	D	E	F	G	H	I	J
Lower Buckeye	Citrus	Van Buren	Van Buren	Yuma	Yuma	Lower Buckeye (W)	Lower Buckeye (W)	Citrus (S)	Citrus (S)
Total Con. Costs	\$592,716	\$1,119,838	\$504,591	\$457,954	\$433,594	\$433,594	\$433,594	\$433,594	\$433,594

¹ Line segment cost does not include oversizing.

9.0 SUMMARY AND CONCLUSIONS

1. The WGCPA is located in two pressures zones with Lower Buckeye Road being the pressure zone dividing line.
2. The proposed potable water distribution system pressures are in accordance with City of Goodyear's design criteria.
3. Pipe velocities reported during the WaterCAD model performed by Tata & Howard are within the established City of Goodyear design criteria.
4. Storage reservoir capacities of 5.0 MG are proposed at buildout of the WGCPA.
5. One Water Plant site is proposed to service both zones. Booster pumping capacity of 5,700 gpm and 5,830 gpm, respectively, for the Zone 1 and Gila Zones will be provided at buildout.
6. The land use indicated in this report is based upon the developer's anticipated build-out of each development project.
7. The water quality reported in the two (2) wells tested indicates a high concentration of TDS, arsenic and nitrates was noted. ADWR information for a third well indicates high TDS and Fluoride. Treatment will very likely be required.
8. The disposal of RO treatment generated brine to the City sewers is prohibited. Evaporation basins were investigated and a preliminary analysis indicates that approximately 310 acres of basin area would be required to dispose of the estimated 1,170,000 gpd (avg.) to be generated. A siting study is recommended to be performed as part of a future study to select a location for this facility that would most effectively meet the City's needs.
9. Water sources considered for providing source water to the WGCPA included the drilling of six (6) wells.
10. This report provides a conceptual plan for developing a well system to provide potable water necessary for the development of the properties within the study limits. Alternatives such as developing a system to convey CAP allotments to the City, use of additional water in the Adaman service area and/or the Liberty Utilities service area have also been identified as potential sources to supply all or a portion of the water required for this area.

10.0 REFERENCES

1. "Engineering Design Standards and Policies Manual," City of Goodyear, Arizona.
2. "Well Siting and Impact Analysis; West Goodyear IDG-Goodyear, Arizona"; Clear Creek Associates, letter to Westpac Development Corporation dated August 25, 2005.
3. Integrated Water Master Plan for City of Goodyear, Black & Veatch, June 2008.
4. "West Goodyear Central Planning Area Master Water Study Update" report prepared by CVL, dated June 2006.

APPENDIX A

WELL SAMPLING RESULTS



4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax: (602) 454-9303

LABORATORY REPORT

Prepared For: Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project: W.G.Y.-RID

Sampled: 06/09/12
Received: 06/11/12
Issued: 06/18/12 14:20

NELAP #01109CA / AZ100001 Arizona DHS#AZ0728

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The Chain of Custody, 1 page, is included and is an integral part of this report.

This entire report was reviewed and approved for release.

CASE NARRATIVE

LABORATORY ID

PVF0644-01
PVF0644-02

CLIENT ID

RID-A
RID-B

MATRIX

Water
Water

SAMPLE RECEIPT: Samples were received intact, at 2°C, on ice and with chain of custody documentation.

HOLDING TIMES: All samples were analyzed within prescribed holding times and/or in accordance with the TestAmerica Sample Acceptance Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made.

SUBCONTRACTED: No analyses were subcontracted to an outside laboratory.

Reviewed By:

TestAmerica Phoenix

Linda Eshelman
Project Manager



4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax: (602) 454-9303

Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: W.G.Y.-RID
Report Number: PVF0644

Sampled: 06/09/12
Received: 06/11/12

TOTAL METALS BY ICP/MS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF0644-02 (RID-B - Water)								
Reporting Units: mg/l								
Arsenic	EPA 200.8	12F0458	0.0010	0.0020	1	6/13/2012	6/14/2012	

TestAmerica-Phoenix

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Project Manager

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Coe & Van Lee Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: W.G.Y.-RID

Report Number: PVF0644

Sampled: 06/09/12

Received: 06/11/12

INORGANICS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF0644-01 (RID-A - Water)								
Reporting Units: mg/l								
Fluoride	EPA 300.0	12F0374	0.40	ND	1	6/11/2012	6/11/2012	
Nitrate-N	EPA 300.0	12F0374	2.0	28	10	6/11/2012	6/11/2012	
Total Dissolved Solids	SM 2540C	12F0388	40	2400	2	6/11/2012	6/11/2012	

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Project Manager

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4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: W.G.Y.-RID

Report Number: PVF0644

Sampled: 06/09/12

Received: 06/11/12

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: RID-A (PVF0644-01) - Water EPA 300.0	2	06/09/2012 12:15	06/11/2012 07:05	06/11/2012 10:00	06/11/2012 10:56

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4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: W.G.Y.-RID

Report Number: PVF0644

Sampled: 06/09/12

Received: 06/11/12

METHOD BLANK/OC DATA

TOTAL METALS BY ICP/MS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0458 Extracted: 06/13/12										
Blank Analyzed: 06/14/2012 (12F0458-BLK1)										
Arsenic	ND	0.0010	mg/l							
LCS Analyzed: 06/14/2012 (12F0458-BS1)										
Arsenic	0.104	0.0010	mg/l	0.100		104	85-115			
LCS Dup Analyzed: 06/14/2012 (12F0458-BSD1)										
Arsenic	0.104	0.0010	mg/l	0.100		104	85-115	0.03	20	
Matrix Spike Analyzed: 06/14/2012 (12F0458-MS1)										
Arsenic	0.108	0.0010	mg/l	0.100	0.00248	105	70-130			
Matrix Spike Dup Analyzed: 06/14/2012 (12F0458-MSD1)										
Arsenic	0.110	0.0010	mg/l	0.100	0.00248	107	70-130	2	20	

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4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: W.G.Y.-RID

Report Number: PVF0644

Sampled: 06/09/12

Received: 06/11/12

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0374 Extracted: 06/11/12										
Blank Analyzed: 06/11/2012 (12F0374-BLK1)										
Fluoride	ND	0.40	mg/l							
Nitrate-N	ND	0.20	mg/l							
LCS Analyzed: 06/11/2012 (12F0374-BS1)										
Fluoride	3.70	0.40	mg/l	4.00		92	90-110			
Nitrate-N	4.12	0.20	mg/l	4.00		103	90-110			
LCS Dup Analyzed: 06/11/2012 (12F0374-BSD1)										
Fluoride	3.59	0.40	mg/l	4.00		92	90-110	0.1	20	
Nitrate-N	4.11	0.20	mg/l	4.00		103	90-110	0.05	15	
Matrix Spike Analyzed: 06/11/2012 (12F0374-MS1)										
					Source: PVF0656-02					
Fluoride	4.43	0.40	mg/l	4.00	0.324	103	80-120			
Nitrate-N	4.65	0.20	mg/l	4.00	0.0430	115	80-120			
Matrix Spike Dup Analyzed: 06/11/2012 (12F0374-MSD1)										
					Source: PVF0656-02					
Fluoride	4.40	0.40	mg/l	4.00	0.324	102	80-120	0.6	20	
Nitrate-N	4.60	0.20	mg/l	4.00	0.0430	114	80-120	0.9	15	
Batch: 12F0388 Extracted: 06/11/12										
Blank Analyzed: 06/11/2012 (12F0388-BLK1)										
Total Dissolved Solids	ND	20	mg/l							
LCS Analyzed: 06/11/2012 (12F0388-BS1)										
Total Dissolved Solids	998	20	mg/l	1000		100	80-115			

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Attention: Eric Laurin

Project ID: W.G.Y.-RID
Report Number: PVF0644

Sampled: 06/09/12
Received: 06/11/12

METHOD BLANK/OC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD Limit	Data Qualifiers
<u>Batch: 12F0388 Extracted: 06/11/12</u>								
LCS Dup Analyzed: 06/11/2012 (12F0388-BSD1)								
Total Dissolved Solids	1010	20	mg/l	1000	101	80-115	1	10
Duplicate Analyzed: 06/11/2012 (12F0388-DUP1)								
Total Dissolved Solids	1270	20	mg/l		Source: PVF0570-01 1280		0.8	10
Duplicate Analyzed: 06/11/2012 (12F0388-DUP2)								
Total Dissolved Solids	124	20	mg/l		Source: PVF0603-02 124		0	10

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Attention: Eric Laurin

Project ID: W.G.Y.-RID

Report Number: PVF0644

Sampled: 06/09/12
Received: 06/11/12

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD Relative Percent Difference

TestAmerica Phoenix
Linda Eshelman
Project Manager

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Attention: Eric Laurin

Project ID: W.G.Y.-RID

Report Number: PVF0644

Sampled: 06/09/12
Received: 06/11/12

Certification Summary

TestAmerica Phoenix

Method	Matrix	Nelap	Arizona
EPA 200.8	Water		X
EPA 300.0	Water		X
SM 2540C	Water		X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

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CHAIN OF CUSTODY FORM

Phoenix - 4525 E. Cotton Center Blvd., Suite 189, Phoenix, AZ 85040 (602) 437-3940 FAX (602) 454-9303
Tucson - 1870 W. Plince Road, Suite 59, Tucson, AZ 85705 (520) 807-9801 FAX (520) 807-8903
Las Vegas - 6000 S Eastern Ave., Suite 5E, Las Vegas, NV 89119 (702) 429-1264

THE LEADER IN ENVIRONMENTAL TESTING
TAL-0013-550 (10/10)

Page 6 of 10

[illegible]

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

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Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12

Received: 06/11/12

TOTAL METALS BY ICP/MS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF0701-01 (CLRV - Water)								
Reporting Units: mg/l								
Arsenic	EPA 200.8	12F0465	0.0010	0.0026	1	6/13/2012	6/14/2012	

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Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12

Received: 06/11/12

INORGANICS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF0701-01 (CLRV - Water)								
Reporting Units: mg/l								
Fluoride	EPA 300.0	12F0433	0.40	ND	1	6/12/2012	6/12/2012	
Nitrate-N	EPA 300.0	12F0433	0.20	18	1	6/12/2012	6/12/2012	
Total Dissolved Solids	SM 2540C	12F0545	20	1400	1	6/14/2012	6/14/2012	

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Project Manager

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Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12
Received: 06/11/12

SHORT HOLD TIME DETAIL REPORT

	Hold Time (in days)	Date/Time Sampled	Date/Time Received	Date/Time Extracted	Date/Time Analyzed
Sample ID: CLRV (PVF0701-01) - Water EPA 300.0	2	06/11/2012 11:25	06/11/2012 17:29	06/12/2012 14:00	06/12/2012 15:57

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Coe & Van Loo Consultants, Inc.
4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12
Received: 06/11/12

METHOD BLANK/QC DATA

TOTAL METALS BY ICP/MS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Data Qualifiers
<u>Batch: 12F0465 Extracted: 06/13/12</u>									
Blank Analyzed: 06/14/2012 (12F0465-BLK1)									
Arsenic	ND	0.0010	mg/l						
LCS Analyzed: 06/14/2012 (12F0465-BS1)									
Arsenic	0.108	0.0010	mg/l	0.100		108 85-115			
LCS Dup Analyzed: 06/14/2012 (12F0465-BSD1)									
Arsenic	0.108	0.0010	mg/l	0.100		108 85-115	0.6	20	
Matrix Spike Analyzed: 06/14/2012 (12F0465-MS1)					Source: PVF0755-02				
Arsenic	0.116	0.0010	mg/l	0.100	0.00703	109 70-130			
Matrix Spike Dup Analyzed: 06/14/2012 (12F0465-MSD1)					Source: PVF0755-02				
Arsenic	0.115	0.0010	mg/l	0.100	0.00703	108 70-130	0.6	20	

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4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12
Received: 06/11/12

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0433 Extracted: 06/12/12										
Blank Analyzed: 06/12/2012 (12F0433-BLK1)										
Fluoride	ND	0.40	mg/l							
Nitrate-N	ND	0.20	mg/l							
LCS Analyzed: 06/12/2012 (12F0433-BS1)										
Fluoride	3.74	0.40	mg/l	4.00		94	90-110			
Nitrate-N	4.12	0.20	mg/l	4.00		103	90-110			
LCS Dup Analyzed: 06/12/2012 (12F0433-BSD1)										
Fluoride	3.75	0.40	mg/l	4.00		94	90-110	0.2	20	
Nitrate-N	4.13	0.20	mg/l	4.00		103	90-110	0.2	15	
Matrix Spike Analyzed: 06/12/2012 (12F0433-MS1)										
					Source: PVF0723-01					
Fluoride	10.3	0.40	mg/l	4.00	5.96	108	80-120			
Nitrate-N	5.83	0.20	mg/l	4.00	1.11	118	80-120			
Matrix Spike Dup Analyzed: 06/12/2012 (12F0433-MSD1)										
					Source: PVF0723-01					
Fluoride	10.3	0.40	mg/l	4.00	5.96	110	80-120	0.7	20	
Nitrate-N	5.88	0.20	mg/l	4.00	1.11	119	80-120	0.8	15	
Batch: 12F0545 Extracted: 06/14/12										
Blank Analyzed: 06/14/2012 (12F0545-BLK1)										
Total Dissolved Solids	ND	20	mg/l							
LCS Analyzed: 06/14/2012 (12F0545-BS1)										
Total Dissolved Solids	1010	20	mg/l	1000		101	80-115			

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Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12

Received: 06/11/12

METHOD BLANK/OC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Data Qualifiers
<u>Batch: 12F0545 Extracted: 06/14/12</u>									
LCS Dup Analyzed: 06/14/2012 (12F0545-BSD1)									
Total Dissolved Solids	1010	20	mg/l	1000		101 80-115	0.2	10	
Duplicate Analyzed: 06/14/2012 (12F0545-DUP1)									
Total Dissolved Solids	1420	20	mg/l		Source: PVF0701-01 1370		3	10	
Duplicate Analyzed: 06/14/2012 (12F0545-DUP2)									
Total Dissolved Solids	916	20	mg/l		Source: PVF0966-01 908		0.9	10	

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4550 North 12th Street
Phoenix, AZ 85014-4291
Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12
Received: 06/11/12

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

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Project Manager

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Attention: Eric Laurin

Project ID: WGY-CLRV

Report Number: PVF0701

Sampled: 06/11/12
Received: 06/11/12

Certification Summary

TestAmerica Phoenix

Method	Matrix	Nelap	Arizona
EPA 200.8	Water		X
EPA 300.0	Water		X
SM 2540C	Water		X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

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APPENDIX B

**NODAL DEMAND APPORTIONMENT
TABLE**

**West Goodyear
Water Distribution To Junction Nodes**

Node	Areas To Serve	ADD	MDD (ADDx1.70)	PH (ADDx2.89)
(ID)	(ID)	(gpm)	(gpm)	(gpm)
1	I	56	96	163
2	1/4 J	112	190	323
3	1/4 20.2+20.5	55	94	160
4	1/4 20.2+1/3 10+20.1	88	149	253
5	1/3 10	29	50	85
5.1	P2	23	39	67
6	1/4 9.1+P1	89	151	257
7	9.2+1/4 9.1+O+W	79	135	229
8	2/5 3	62	105	178
9	1/3 2	26	45	76
10	1/3 2	26	45	76
11	-	0	0	0
12	1/3 2	26	45	76
13	1/7 N	11	19	32
14	M	14	24	40
15	1/2 5.1+5.2+B+1/7 N	101	172	292
16	A1+C+1/2 D	121	205	349
17	A2	60	103	175
18	1/2 D	82	139	237
18.1	1/2 A3	43	74	125
19	1/2 A3	43	74	125
20	1/2 5.1+5.4	64	109	185
21	5.3	15	26	44
22	2/7 N	22	37	64
23	3/5 3+2A+3A	111	189	321
24	4+1/2 8+1/4 9.1	88	149	254
25	2/7 N	22	37	64
26	1/7 N+1/4 7	42	71	121
26.1	1/4 9.1+1/4 7+1/2 8	88	149	254
27	1/3 10+1/2 11.2	86	147	250
28	2/5 6+1/2 7	137	232	394
29	2/5 6	75	127	216
30	1/5 6	37	64	108
31	11.1+12.2+12.3	70	119	202
32	12.1+13.1	129	219	373
33	1/2 11.2+Q	82	139	236
34	15.1	44	76	128
35	14.1a	35	60	102
36	14.1c	15	25	43
37	1/2 20.2+1/2 20.3+S+U	112	191	324
38	1/2 20.3+15.2a	93	158	268
39	15.2b	35	60	102
40	14.1b	28	48	82
41	20.4+1/4 J+H+R	163	278	472
41.1	20.3A	26	44	75
42	-	0	0	0
43	-	0	0	0
44	16.1+16.2+OO3	75	127	217
45	13.2+14.1d	67	114	193
45.1	6A	19	32	54
46	-	0	0	0
47	-	0	0	0
48	E1+E2	60	103	175
49	-	0	0	0
50	-	0	0	0
51	1/4 J	112	190	323
52	1/4 J	112	190	323
53	K+L	38	65	110
	Total	3,250	5,525	9,393

APPENDIX C

TATA & HOWARD DECEMBER 2012 MODEL

MSL elevations in this report may be converted to NAVD 88 by using this equation:
NAVD88 = MSL + 2.149 ft



December 10, 2012

Mr. Eric Laurin, P.E.
Associate/Director
Coe & Van Loo Consultants, Inc.
4550 N. 12th Street
Phoenix, AZ 85014

Subject: Additional Water Modeling for West Goodyear Developments Hydraulic
Analysis
Goodyear, Arizona
T & H No. 2587

Dear Mr. Laurin:

As requested, Tata & Howard, Inc. has performed an additional analysis of the West Goodyear Central Planning Area water system to address comments received by the City of Goodyear in November 2012. Based on the City's comments, a revised study area was established by Coe & Van Loo Consultants (CVL) to completely separate the study area from the existing water distribution system.

As previously discussed, CVL requested that the study area be evaluated as an independent system. Therefore, impacts of this development on the water system outside of the West Goodyear Central Planning Area were not considered. Also, additional growth or infrastructure improvements in other areas of the City were not included in the model simulations. To separate the study area from the City's water distribution system, valves were originally closed in the hydraulic model. Based on the City's comments, CVL has proposed to close additional valves and install additional water main to separate Site 12 from the study area.

To separate the study area, valves were closed in the model on Van Buren Street and Yuma Road east of Cotton Lane, on 173rd Avenue north of Lower Buckeye Road, on Lower Buckeye Road west of 173rd Avenue, on 169th Avenue south of Lower Buckeye Road, and on MC 85 west of Cotton Lane. The proposed 24-inch diameter water main on MC 85 and the proposed 12-inch diameter water main connecting 175th Avenue and MC 85 would connect just west of the closed valve, the proposed 12-inch diameter water main on Elwood Road would not connect to the existing 16-inch diameter water main on

Cotton Lane, and an additional proposed 12-inch diameter water main would be installed to create a loop between Lower Buckeye Road and Elwood Road just west of Site 12.

The two service zones discussed in Tata & Howard's August 30, 2012 letter were included in this evaluation. Zone 1 and the Gila Service Area would be separated by valves located just north of Lower Buckeye Road at Perryville Road, Citrus Road, and 173rd Avenue. The pressure zones would be served by two sets of pumps at the proposed Silva site. The Zone 1 pumps would serve the system through a 24-inch diameter water main that connects to the system on Citrus Road. A dedicated 24-inch diameter transmission main would be installed on Citrus Road from the Silva site to Lower Buckeye Road. Design information for the planned Silva site was not available at the time of this study. The hydraulic model simulations were completed using two fixed reservoirs. The Zone 1 Reservoir was set at a hydraulic gradeline (HGL) of 1,165 feet above mean sea level (MSL) and the Gila River Zone Reservoir was set at a HGL of 1,100 feet above MSL.

The proposed demands and evaluation criteria previously discussed in Tata & Howard's August 30, 2012 letter were utilized for this analysis. The evaluation criteria includes a minimum pressure of 40 pounds per square inch (psi) and a maximum pressure of 80 psi at ground level during average day (ADD), maximum day (MDD), and peak hour demands, a maximum velocity of 10 feet per second (ft/s) under peak hour conditions, and an upper limit for headloss in water mains of between two and three feet per 1,000 feet (ft/1,000ft) during peak hour conditions. The City does allow pressures above 80 psi in localized areas of lower elevations. Residential homes in areas with pressures above 80 psi would be required to have individual pressure reducing valves (PRV) installed at the time of development to maintain pressures less than 80 psi. Based on information provided by CVL, the required fire flow while maintaining 20 psi throughout the planning area is 1,500 gpm for residential areas and 3,000 gpm for non-residential areas.

Hydraulic Analysis

Based on comments from the City, a third alternative was considered for creating the two pressure zones. Alternative No. 3 considers the installation of PRVs between the two service zones to be utilized in an emergency.

Alternative No. 3 – Proposed Water Main Configuration with Emergency PRVs

CVL proposes an emergency PRV on Citrus Road just north of Lower Buckeye Road. By setting the PRV at a slightly lower HGL than the normal operating HGL of the Gila River System, the PRV would act as a closed valve during normal operating conditions. The results of simulations utilizing the emergency PRV would be similar to Alternative No. 2 discussed in Tata & Howard's August 30, 2012 letter.

Hydraulic simulations were conducted to estimate the minimum and maximum pressures in the study area during ADD, MDD, and peak hour demand conditions. Under ADD conditions, modeled pressures range from approximately 60 psi to 98 psi in Zone 1 and 63 psi to 87 psi in the Gila Service Area. Under MDD conditions, pressures in the study area range from 58 psi to 97 psi in Zone 1 and 62 psi to 86 psi in the Gila Service Area. Under PH conditions, modeled pressures range from approximately 57 psi to 95 psi in Zone 1 and 57 psi to 79 psi in the Gila Service Area.

Pressures in the study area do not drop below the City's minimum pressure of 40 psi during these demand conditions. Areas in Zone 1 below an elevation of approximately 980 feet above MSL could experience pressures greater than 80 psi. Ground elevations less than 980 feet are located between Yuma Road and Lower Buckeye Road. Areas in the Gila Service Area below an elevation of approximately 915 feet above MSL could experience pressures greater than 80 psi. Ground elevations less than 915 feet are located south of Broadway Road.

Under ADD, MDD, and peak hour demand condition, there are no proposed water mains that exceed the design criteria for velocity and headloss. Due to potential high flows from the Silva site into Zone 1, a 30-inch diameter water main from the Silva site to Citrus Road is recommended. The recommended water main configuration is shown in Figure No. 4.

Utilizing the PRV during emergency conditions only would reduce the amount of water needed from the Zone 1 pumps to supply the Gila Service Zone. The peak demand from the Zone 1 pumps and the flow through the Zone 1 system would decrease. This lowers the headloss in the water mains and would eliminate the need for the larger water mains originally proposed on Citrus Road, Harrison Street and Yuma Road. Due to the high headlosses in the proposed 24-inch diameter water main serving Zone 1 from the Silva site, the 30-inch diameter water main from the Silva Site to Citrus Road is still recommended.

As previously discussed, the model nodes in the study area were designated as residential or non-residential for the evaluation of the available fire flow while maintaining 20 psi under MDD conditions based on Figure 3 Water Study Area – Land Use provided by CVL. The water mains in the residential neighborhood including 185th Avenue, Raymond Street, Vista Norte Street and 185th Drive are 6-inch diameter. This neighborhood is fed by a 6-inch diameter main on 183rd Avenue between Las Brisas Drive and Vista Norte Street. To provide a second feed to this neighborhood and increase the available fire flow along Raymond Street, an 8-inch diameter water main is recommended on Illini Street from 185th Avenue to 185th Drive. The recommended water main configuration is shown in Figure No. 4.

To meet the required fire flow while maintaining 20 psi under MDD conditions at the end of the 8-inch diameter main on 169th Avenue, an emergency PRV would also have be installed at this location instead of the proposed closed valve. It is recommended that this PRV be installed and set to operate during fire flow conditions only. The recommended water main configuration is shown in Figure No. 4.

It is important to note that the available fire flow was estimated based on the configuration of the proposed water mains provided by CVL. Information was not provided on the water mains to be located within individual land use areas. These water mains should be a minimum of 8-inch diameter and should be looped to the main arterial roads in multiple locations. The estimated available flow within these land use areas cannot be determined at this time and should be evaluated when the final water main configuration is designed.

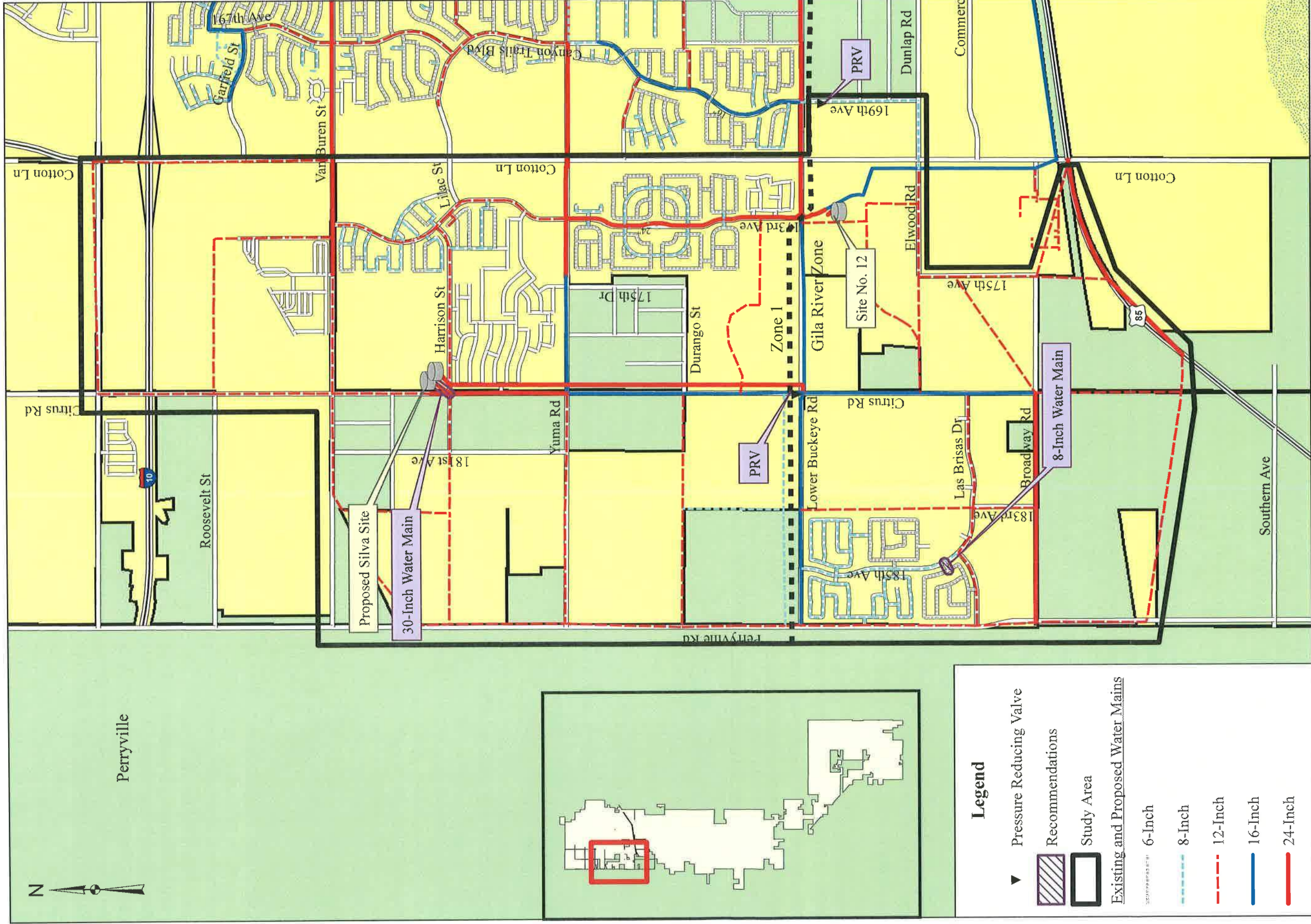
We appreciate the opportunity to assist you on this important project. If you have any questions regarding this letter, please contact our office.

Sincerely,

TATA & HOWARD, INC.



Donald J. Tata, P.E.
President



Alternative No. 3
Recommended Water Main Configuration
West Goodyear Central Planning Area
Goodyear, Arizona

Figure No.

4



TATA & HOWARD
Water and Wastewater Consultants

Date: December 2012 Scale: 1:24,000



Node Map
West Goodyear Central Planning Area
Goodyear, Arizona



Approximate Scale: 1" = 800'
December 2012

- Legend
- Node
 - ▼ Pressure Reducing Valve
 - Study Area
 - Water Main



Link Map
West Goodyear Central Planning Area
Goodyear, Arizona



Approximate Scale: 1" = 800'
December 2012

Legend

- Node
- Pressure Reducing Valve
- Study Area
- Water Main

Average Day Demand
Pipe Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
101	Zone 1	22676	22836	1294	16	140	258	0.41	0.06	0.04
103	Gila River Zone	22678	J34	1290	16	120	-182	0.29	0.04	0.03
105	Gila River Zone	22680	22682	2663	16	125	-492	0.79	0.48	0.18
109	Gila River Zone	22684	J22	818	12	120	-35	0.1	0	0.01
111	Gila River Zone	22686	J10	1112	12	120	16	0.05	0	0
113	Gila River Zone	22682	J3174	2642	16	125	610	0.97	0.71	0.27
117	Gila River Zone	22690	22692	1460	12	120	-48	0.14	0.02	0.01
119	Gila River Zone	22692	J3228	1233	12	120	-83	0.24	0.04	0.03
121	Gila River Zone	22694	22696	1179	12	120	142	0.4	0.09	0.08
123	Gila River Zone	22696	19302	792	12	120	75	0.21	0.02	0.02
1585	Zone 1	23518	22816	2303	12	120	-149	0.42	0.2	0.09
1593	Zone 1	22698	22842	2701	12	120	278	0.79	0.74	0.28
1597	Zone 1	23520	22676	2604	12	120	-141	0.4	0.2	0.08
1603	Zone 1	23522	22672	1412	24	140	1112	0.79	0.13	0.09
1605	Zone 1	23524	J418	413	12	120	59	0.17	0.01	0.02
1609	Zone 1	23526	J432	413	12	120	70	0.2	0.01	0.02
20408A	Zone 1	6748	18488	801	6	100	5	0.06	0.01	0.01
2421	Gila River Zone	22684	J3180	1279	12	120	-77	0.22	0.03	0.03
2429	Gila River Zone	23998	22682	1994	16	120	-417	0.67	0.29	0.14
2431	Gila River Zone	23998	J3226	1865	16	120	288	0.46	0.13	0.07
2601	Zone 1	24070	24072	1526	12	120	-34	0.1	0.01	0.01
2605	Zone 1	24072	3290	3858	12	120	-34	0.1	0.02	0.01
275	Zone 1	3290	22648	1465	24	130	-34	0.02	0	0
277	Zone 1	22698	23522	1231	24	140	1112	0.79	0.11	0.09
279	Zone 1	22670	22672	1328	12	125	-214	0.61	0.21	0.16
281	Zone 1	20020	22672	2647	16	125	-435	0.69	0.38	0.14
293	Zone 1	22674	J3214	1189	12	120	23	0.07	0	0
295	Gila River Zone	22684	22818	1316	12	120	112	0.32	0.07	0.05
299	Gila River Zone	22826	22828	5264	12	120	32	0.09	0.03	0
29F2B7	Zone 1	20028	22810	1388	24	130	0	0	0	0
2B539	Zone 1	19990	20090	172	8	110	33	0.21	0.01	0.04
2B5CF	Zone 1	18542	18796	191	8	110	-39	0.25	0.01	0.06

Average Day Demand
Pipe Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
2B5D2	Zone 1	18796	6748	170	8	110	27	0.17	0.01	0.03
2B5EF	Zone 1	18796	20350	839	24	130	-107	0.08	0	0
2B624	Zone 1	20350	18610	170	8	110	31	0.2	0.01	0.04
2B627	Zone 1	18666	20350	189	8	110	-46	0.29	0.02	0.08
2B62A	Zone 1	20350	20004	700	24	130	-186	0.13	0	0
2B64A	Zone 1	20344	20004	154	6	100	0	0	0	0
2B6A2	Zone 1	19990	20014	861	24	130	-293	0.21	0.01	0.01
2B6A5	Zone 1	20014	20028	499	24	130	-374	0.27	0.01	0.01
2B6CA	Zone 1	20326	20014	70	8	110	-70	0.45	0.01	0.18
2B7B6	Zone 1	20260	20290	549	6	100	-37	0.42	0.15	0.27
2B7CE	Zone 1	20274	20290	547	6	100	-30	0.34	0.1	0.18
2B7D4	Zone 1	20290	20326	117	8	110	-68	0.43	0.02	0.17
2B7E9	Zone 1	20264	20286	439	6	100	17	0.2	0.03	0.07
2B7EC	Zone 1	20286	20256	611	6	100	0	0	0	0
2BB61	Zone 1	20264	20274	440	6	100	-1	0.01	0	0
2BBA9	Zone 1	20286	20260	881	6	100	9	0.1	0.02	0.02
2BBBB	Zone 1	20274	20256	269	6	100	23	0.26	0.03	0.11
2BBF9	Zone 1	20256	20260	269	6	100	18	0.2	0.02	0.07
2BC66	Zone 1	70	20038	170	6	100	8	0.09	0	0.02
2BC6C	Zone 1	20038	20264	269	6	100	21	0.24	0.03	0.1
2BC6F	Zone 1	70	20060	1169	6	100	-15	0.17	0.06	0.05
2BC7E	Zone 1	20060	18828	680	6	100	-6	0.07	0.01	0.01
2BC8B	Zone 1	20030	19990	186	8	110	-58	0.37	0.02	0.13
2BC91	Zone 1	20038	20030	891	6	100	-20	0.22	0.07	0.08
2BC97	Zone 1	20060	20222	353	8	110	-9	0.06	0	0
2BC9D	Zone 1	20050	20222	307	8	110	16	0.1	0	0.01
2BCA0	Zone 1	20222	20050	562	6	100	-5	0.05	0	0.01
2BCAC	Zone 1	20030	20050	258	8	110	25	0.16	0.01	0.03
2C1AC	Zone 1	18594	20034	270	8	110	-5	0.03	0	0
2C1B2	Zone 1	20034	20118	611	8	110	-6	0.04	0	0
2C1C4	Zone 1	20086	20176	626	6	100	-5	0.05	0	0.01
2C1CE	Zone 1	20176	18818	233	6	100	-3	0.04	0	0

**Average Day Demand
Pipe Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
2C1D7	Zone 1	18818	20086	426	6	100	6	0.07	0	0.01
2C1EF	Zone 1	20104	20118	360	6	100	-4	0.05	0	0
2C210	Zone 1	20090	20104	1282	6	100	5	0.06	0.01	0.01
2C21D	Zone 1	20014	20076	171	8	110	9	0.06	0	0
2C220	Zone 1	20156	20076	459	8	110	-7	0.04	0	0
2C223	Zone 1	20076	20158	422	8	110	2	0.01	0	0
2C5DE	Zone 1	20006	18818	172	6	100	12	0.14	0.01	0.04
2C91E	Zone 1	20090	20118	449	8	110	19	0.12	0.01	0.02
2C924	Zone 1	20104	20034	1006	6	100	-1	0.02	0	0
2C930	Zone 1	20176	20090	270	6	100	-4	0.05	0	0.01
2C937	Zone 1	20086	20034	270	6	100	7	0.08	0	0.01
2C95A	Zone 1	20052	20030	234	6	100	-9	0.1	0	0.02
2C9A6	Zone 1	20004	20006	192	24	130	-187	0.13	0	0
2C9BB	Zone 1	19990	20006	539	24	130	200	0.14	0	0
301	Gila River Zone	22828	22830	849	12	120	25	0.07	0	0
303	Gila River Zone	22830	22824	2392	24	120	-87	0.06	0	0
305	Gila River Zone	22688	22820	1511	16	125	279	0.44	0.1	0.06
307	Gila River Zone	22820	22828	3294	12	120	106	0.3	0.15	0.05
311	Gila River Zone	22822	31160	818	12	120	155	0.44	0.08	0.09
313	Gila River Zone	22822	22696	1655	12	120	-39	0.11	0.01	0.01
315	Gila River Zone	22818	22834	2599	24	125	-116	0.08	0	0
317	Gila River Zone	22834	22820	2599	24	130	-5	0	0	0
319	Gila River Zone	22834	3110	1433	12	120	-111	0.31	0.07	0.05
321	Gila River Zone	22824	22832	1628	12	120	-71	0.2	0.04	0.02
323	Zone 1	22836	3208	982	16	140	29	0.05	0	0
32324	Zone 1	18796	3202	840	24	130	38	0.03	0	0
327	Zone 1	22836	22838	1602	12	120	93	0.26	0.06	0.04
329	Zone 1	22838	31186	976	12	120	18	0.05	0	0
331	Zone 1	22664	22842	2517	12	120	-87	0.25	0.08	0.03
335	Zone 1	22816	22652	366	12	120	-149	0.42	0.03	0.09
353	Gila River Zone	22824	3224	2827	24	125	-53	0.04	0	0
35ACD	Zone 1	9738	18666	261	8	110	-25	0.16	0.01	0.03

**Average Day Demand
Pipe Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
35B3D	Zone 1	20060	9744	269	8	110	-10	0.06	0	0
35E89	Zone 1	18666	9744	954	6	100	7	0.08	0.01	0.01
35F26	Zone 1	9738	9732	567	6	100	4	0.05	0	0.01
35FF8	Zone 1	18610	18632	466	8	110	13	0.08	0	0.01
36080	Zone 1	18630	18632	532	6	100	-2	0.02	0	0
36095	Zone 1	18630	18594	337	8	110	-1	0	0	0
36098	Zone 1	18632	18630	301	8	110	6	0.04	0	0
361FD	Zone 1	9718	9710	662	6	100	-2	0.02	0	0
362E0	Zone 1	18594	9718	270	6	100	-1	0.01	0	0
36497	Zone 1	18610	10716	931	6	100	5	0.06	0.01	0.01
364F9	Zone 1	10716	9690	270	6	100	0	0	0	0
366FB	Zone 1	9702	18530	310	6	100	3	0.04	0	0
36879	Zone 1	11034	10720	269	6	100	3	0.03	0	0
368E7	Zone 1	11034	18542	691	6	100	-10	0.12	0.02	0.03
36919	Zone 1	18542	9702	600	6	100	11	0.13	0.02	0.03
36956	Zone 1	11034	18536	749	6	100	3	0.03	0	0
36959	Zone 1	18536	18530	439	6	100	-2	0.03	0	0
36990	Zone 1	10720	18536	480	6	100	2	0.03	0	0
36AD9	Zone 1	9726	18530	269	6	100	3	0.03	0	0
36AFA	Zone 1	6748	9690	786	6	100	6	0.06	0.01	0.01
36BCF	Zone 1	9690	18488	587	6	100	0	0	0	0
391E08	Zone 1	70	66	178	6	100	3	0.03	0	0
411	Zone 1	22876	23518	2595	12	120	34	0.1	0.01	0.01
413	Zone 1	22876	24070	5276	12	120	-34	0.1	0.03	0.01
593	Zone 1	20052	18828	57	6	100	7	0.08	0	0.01
69	Zone 1	20028	23524	1486	12	120	59	0.17	0.02	0.02
71	Zone 1	23648	13166	288	24	130	110	0.08	0	0
73	Zone 1	22652	22650	2698	12	120	121	0.34	0.16	0.06
75	Zone 1	22652	13164	2218	12	120	-333	0.95	0.85	0.38
77	Zone 1	22652	22656	2296	12	120	-37	0.11	0.02	0.01
79	Zone 1	22656	22658	394	12	120	-51	0.15	0	0.01
83	Zone 1	22660	22662	987	12	120	11	0.03	0	0

**Average Day Demand
Pipe Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
85	Zone 1	22654	22662	1480	12	120	15	0.04	0	0
87	Zone 1	22654	22664	1100	12	120	-41	0.12	0.01	0.01
89	Zone 1	22664	22666	2616	12	120	-16	0.05	0	0
8B1A3	Zone 1	9710	18610	270	6	100	-7	0.08	0	0.01
8B1B5	Zone 1	9726	18666	903	6	100	-8	0.09	0.02	0.02
8B397	Zone 1	10720	9702	269	6	100	-3	0.03	0	0
8B39A	Zone 1	10716	18594	1422	6	100	-2	0.02	0	0
8CA72	Zone 1	20020	20028	1309	24	130	434	0.31	0.02	0.02
8CB0B	Zone 1	9744	9726	1339	6	100	3	0.03	0	0
8CB0E	Zone 1	9744	9732	348	8	110	-13	0.08	0	0.01
8CB14	Zone 1	9732	9738	281	8	110	-15	0.1	0	0.01
8CB29	Zone 1	9710	9718	656	6	100	2	0.02	0	0
8CB54	Zone 1	6748	18488	1299	6	100	4	0.05	0.01	0
91	Zone 1	22666	22668	2538	12	120	-126	0.36	0.16	0.06
93	Zone 1	22668	22670	1341	12	125	-214	0.61	0.21	0.16
95	Zone 1	22666	22674	2634	12	120	31	0.09	0.01	0
97	Zone 1	22674	23520	2678	12	120	-81	0.23	0.08	0.03
99	Zone 1	22672	22676	2628	16	140	441	0.7	0.31	0.12
P101	Gila River Zone	J88	J80	325	8	100	-6	0.04	0	0
P103	Gila River Zone	J90	J94	298	8	100	6	0.04	0	0
P105	Gila River Zone	J88	J90	954	8	100	4	0.02	0	0
P107	Gila River Zone	J92	J72	292	8	100	-8	0.05	0	0
P109	Gila River Zone	J94	J70	273	8	100	6	0.04	0	0
P11	Gila River Zone	J10	22688	2594	12	120	-44	0.13	0.02	0.01
P111	Gila River Zone	J92	J94	973	8	100	0	0	0	0
P113	Gila River Zone	J96	J690	1028	8	100	-14	0.09	0.01	0.01
P115	Gila River Zone	J96	J98	295	8	100	-11	0.07	0	0.01
P117	Gila River Zone	J100	J98	803	8	100	11	0.07	0.01	0.01
P119	Gila River Zone	J102	J100	2012	8	100	3	0.02	0	0
P121	Gila River Zone	J100	J102	326	8	100	-8	0.05	0	0
P123	Gila River Zone	J104	J692	1241	8	100	5	0.03	0	0
P125	Gila River Zone	J104	J106	295	8	100	-5	0.03	0	0

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P127	Gila River Zone	J108	J112	296	8	100	5	0.03	0	0
P129	Gila River Zone	J110	J116	751	8	100	-6	0.04	0	0
P13	Gila River Zone	J12	J3220	692	8	120	51	0.32	0.06	0.08
P131	Gila River Zone	J108	J110	247	8	100	3	0.02	0	0
P133	Gila River Zone	J112	J106	299	8	100	5	0.03	0	0
P135	Gila River Zone	J112	J114	352	8	100	0	0	0	0
P137	Gila River Zone	J116	J108	542	8	100	7	0.05	0	0
P139	Gila River Zone	J116	J120	222	8	100	-13	0.08	0	0.01
P141	Gila River Zone	J118	22678	1447	12	120	-153	0.43	0.13	0.09
P143	Gila River Zone	J120	J96	354	8	100	-25	0.16	0.01	0.03
P145	Gila River Zone	J118	J120	179	8	100	-12	0.07	0	0.01
P15	Gila River Zone	J14	J28	717	6	100	0	0	0	0
P1673	Gila River Zone	J3160	22832	1828	12	120	125	0.35	0.11	0.06
P1675	Gila River Zone	22820	J3160	3184	12	120	5	0.01	0	0
P1677	Gila River Zone	22832	J3224	2698	12	120	53	0.15	0.03	0.01
P1679	Gila River Zone	J10	22680	3887	12	120	-162	0.46	0.39	0.1
P1681	Zone 1	22842	J3182	2240	12	120	99	0.28	0.09	0.04
P1683	Zone 1	J3164	22698	424	24	120	-348	0.25	0.01	0.01
P1685	Zone 1	J3166	22650	839	24	130	-57	0.04	0	0
P1687	Zone 1	J3166	J3170	990	12	120	123	0.35	0.06	0.06
P1689	Zone 1	J3168	J3184	1530	12	120	-2	0	0	0
P1691	Zone 1	J3170	J3168	1670	12	120	80	0.23	0.05	0.03
P1693	Gila River Zone	J3172	22690	666	12	120	-48	0.14	0.01	0.01
P1695	Gila River Zone	J3174	22688	1070	16	125	416	0.66	0.14	0.13
P1697	Gila River Zone	J3172	J3174	1059	12	100	-112	0.32	0.08	0.07
P1699	Gila River Zone	J3176	22826	2161	12	120	88	0.25	0.07	0.03
P17	Gila River Zone	J18	J16	882	6	100	0	0	0	0
P1701	Gila River Zone	J3180	J118	1247	12	120	-164	0.47	0.13	0.1
P1703	Zone 1	J3182	22658	174	12	120	62	0.18	0	0.02
P1705	Zone 1	22660	J3182	435	12	120	-11	0.03	0	0
P1707	Zone 1	J3184	23518	1989	12	120	-62	0.17	0.03	0.02
P1711	Gila River Zone	J3176	22818	341	12	120	-200	0.57	0.05	0.15

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P1715	Zone 1	22698	J430	3296	12	120	231	0.66	0.64	0.19
P1727	Zone 1	J3202	J3222	785	24	130	0	0	0	0
P1729	Zone 1	J3186	J3202	1983	12	120	-19	0.05	0	0
P1731	Zone 1	J3204	V8000	242	12	120	0	0	0	0
P1733	Zone 1	J3208	V8002	216	16	140	0	0	0	0
P1737	Zone 1	J3206	23520	2281	8	120	29	0.18	0.07	0.03
P1739	Zone 1	J3206	J3208	2639	8	120	-29	0.18	0.08	0.03
P1741	Gila River Zone	J3172	22822	1567	12	120	116	0.33	0.09	0.05
P1745	Gila River Zone	J3212	J3210	2444	8	120	0	0	0	0
P1747	Gila River Zone	19302	J3210	1563	8	120	0	0	0	0
P1749	Zone 1	RES9006	22698	551	24	120	1991	1.41	0.2	0.36
P1751	Gila River Zone	RES9008	22682	8488	24	120	1589	1.13	2.01	0.24
P1753	Zone 1	V8000	22678	115	12	120	0	0	0	0
P1755	Zone 1	V8002	22682	223	16	140	0	0	0	0
P1757	Zone 1	V8004	10982	88	24	130	0	0	0	0
P1759	Zone 1	J3214	J3204	1149	12	120	0	0	0	0
P1761	Gila River Zone	J3216	J14	294	6	100	0	0	0	0
P1763	Gila River Zone	J3218	J20	248	6	100	0	0	0	0
P1765	Gila River Zone	J3220	22686	382	8	120	51	0.32	0.03	0.08
P1769	Zone 1	J3222	V8004	48	24	130	0	0	0	0
P1773	Gila River Zone	V8006	J3212	132	8	120	0	0	0	0
P1777	Gila River Zone	J3226	10982	112	16	120	48	0.08	0	0
P1779	Gila River Zone	J3228	22694	407	12	120	157	0.45	0.04	0.1
P1781	Gila River Zone	J3226	J3228	1466	12	120	240	0.68	0.31	0.21
P19	Gila River Zone	J18	J3218	580	6	100	0	0	0	0
P21	Gila River Zone	J20	J26	297	6	100	0	0	0	0
P23	Gila River Zone	J22	22686	945	12	120	-35	0.1	0.01	0.01
P25	Gila River Zone	J24	J3216	332	6	100	0	0	0	0
P27	Gila River Zone	J22	J24	182	6	100	0	0	0	0
P29	Gila River Zone	J26	J24	327	6	100	0	0	0	0
P31	Gila River Zone	J28	J16	297	6	100	0	0	0	0
P33	Gila River Zone	J28	J32	930	6	100	0	0	0	0

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P35	Gila River Zone	J32	J26	443	6	100	0	0	0	0
P37	Gila River Zone	J32	J3216	877	6	100	0	0	0	0
P39	Gila River Zone	J34	22680	1317	16	120	-244	0.39	0.07	0.05
P41	Gila River Zone	J34	J78	821	8	100	62	0.4	0.14	0.17
P43	Gila River Zone	J38	J84	331	6	100	-7	0.08	0	0.01
P45	Gila River Zone	J36	J44	285	6	100	7	0.08	0	0.01
P47	Gila River Zone	J38	J46	285	6	100	7	0.08	0	0.01
P49	Gila River Zone	J40	J48	626	6	100	-4	0.05	0	0.01
P501	Zone 1	J418	23526	675	12	120	70	0.2	0.01	0.02
P503	Zone 1	J418	J420	204	8	120	-12	0.07	0	0.01
P505	Zone 1	J420	J422	1044	8	120	-10	0.06	0	0
P507	Zone 1	J422	J424	310	8	120	6	0.04	0	0
P509	Zone 1	J424	J420	1080	6	120	4	0.05	0	0
P51	Gila River Zone	J44	J60	256	6	100	10	0.11	0.01	0.02
P511	Zone 1	J422	J426	272	8	120	-19	0.12	0	0.01
P513	Zone 1	J426	J428	280	8	120	-31	0.2	0.01	0.03
P515	Zone 1	J428	J430	174	8	120	-51	0.33	0.02	0.09
P517	Zone 1	J432	J440	422	12	120	80	0.23	0.01	0.03
P519	Zone 1	J432	J434	184	12	100	-32	0.09	0	0.01
P521	Zone 1	J434	J428	665	6	120	-20	0.23	0.04	0.06
P523	Zone 1	J436	J434	240	12	100	0	0	0	0
P525	Zone 1	J434	J438	356	6	120	-12	0.14	0.01	0.02
P527	Zone 1	J438	J426	930	6	120	-12	0.14	0.02	0.02
P529	Zone 1	J440	J458	291	12	120	205	0.58	0.05	0.16
P53	Gila River Zone	J46	J50	290	6	100	4	0.05	0	0
P531	Zone 1	J430	J440	584	12	120	176	0.5	0.07	0.12
P533	Zone 1	J442	J490	185	12	120	162	0.46	0.02	0.1
P535	Zone 1	J444	J460	531	12	120	185	0.52	0.07	0.13
P537	Zone 1	J444	J448	216	8	120	-56	0.36	0.02	0.1
P539	Zone 1	J448	J450	302	8	120	-57	0.36	0.03	0.1
P541	Zone 1	J450	J452	339	8	120	-44	0.28	0.02	0.07
P543	Zone 1	J452	J446	347	8	120	-31	0.19	0.01	0.03

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P545	Zone 1	J446	J454	614	8	120	-31	0.2	0.02	0.03
P547	Zone 1	J454	J452	681	6	120	17	0.2	0.03	0.05
P549	Zone 1	J454	J440	191	8	120	-50	0.32	0.02	0.08
P55	Gila River Zone	J44	J52	279	6	100	-3	0.03	0	0
P551	Zone 1	J442	J450	596	8	120	15	0.09	0.01	0.01
P553	Zone 1	J456	J502	98	12	120	165	0.47	0.01	0.11
P555	Zone 1	J456	J448	312	8	120	2	0.01	0	0
P557	Zone 1	J458	J442	163	12	120	179	0.51	0.02	0.12
P559	Zone 1	J460	J462	346	12	120	178	0.5	0.04	0.12
P561	Zone 1	J462	J464	303	12	120	166	0.47	0.03	0.11
P563	Zone 1	J464	J22648	251	12	120	203	0.58	0.04	0.15
P565	Zone 1	J464	J468	431	8	120	-38	0.24	0.02	0.05
P567	Zone 1	J468	J470	606	6	120	-10	0.12	0.01	0.02
P569	Zone 1	J470	J472	277	6	120	-10	0.12	0.01	0.02
P57	Gila River Zone	J48	J42	279	6	100	-2	0.02	0	0
P571	Zone 1	J472	J474	289	6	120	-10	0.12	0.01	0.02
P573	Zone 1	J474	J476	317	6	120	16	0.19	0.01	0.04
P577	Zone 1	J476	J462	413	8	120	-12	0.08	0	0.01
P579	Zone 1	J460	J480	637	8	120	6	0.04	0	0
P581	Zone 1	J480	J482	260	8	120	-24	0.16	0.01	0.02
P583	Zone 1	J482	J484	261	8	120	-27	0.17	0.01	0.03
P585	Zone 1	J484	J486	538	8	120	-31	0.2	0.02	0.03
P589	Zone 1	J486	J488	249	8	120	0	0	0	0
P59	Gila River Zone	J50	J42	507	6	100	2	0.02	0	0
P591	Zone 1	J490	J456	160	12	120	170	0.48	0.02	0.11
P593	Zone 1	J490	J492	685	6	120	-11	0.12	0.01	0.02
P595	Zone 1	J492	J494	340	6	120	-16	0.18	0.01	0.04
P597	Zone 1	J494	J496	329	8	120	-10	0.06	0	0
P599	Zone 1	J496	J498	950	8	120	-14	0.09	0.01	0.01
P601	Zone 1	J498	J458	166	8	120	-24	0.16	0	0.02
P605	Zone 1	J494	J498	713	6	120	-8	0.09	0.01	0.01
P607	Zone 1	J502	J444	178	12	120	129	0.36	0.01	0.07

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P609	Zone 1	J486	J502	1150	8	120	-36	0.23	0.05	0.04
P61	Gila River Zone	J48	J54	302	6	100	-2	0.03	0	0
P611	Zone 1	J480	J474	278	6	120	27	0.31	0.03	0.11
P613	Zone 1	J476	J468	306	8	120	27	0.17	0.01	0.03
P63	Gila River Zone	J52	J46	615	6	100	-3	0.04	0	0
P65	Gila River Zone	J54	J50	462	6	100	-2	0.02	0	0
P67	Gila River Zone	J52	J54	749	6	100	0	0	0	0
P71	Gila River Zone	J60	J40	524	6	100	-4	0.05	0	0.01
P75	Gila River Zone	J64	J12	457	8	100	51	0.32	0.05	0.12
P77	Gila River Zone	J64	J60	194	6	100	-14	0.16	0.01	0.05
P79	Gila River Zone	J66	J68	876	8	100	3	0.02	0	0
P81	Gila River Zone	J68	J90	289	8	100	3	0.02	0	0
P83	Gila River Zone	J70	J82	335	8	100	6	0.04	0	0
P831	Gila River Zone	J690	J102	258	8	100	11	0.07	0	0.01
P833	Gila River Zone	J690	J78	197	8	110	-25	0.16	0.01	0.03
P835	Gila River Zone	J692	J110	638	8	100	-9	0.06	0	0
P837	Gila River Zone	J692	J64	203	8	100	13	0.08	0	0.01
P87	Gila River Zone	J66	J88	265	8	100	-3	0.02	0	0
P89	Gila River Zone	J78	J64	1325	8	100	23	0.15	0.04	0.03
P91	Gila River Zone	J80	J72	337	8	100	8	0.05	0	0
P93	Gila River Zone	J78	J80	199	8	100	14	0.09	0	0.01
P95	Gila River Zone	J82	J92	370	8	100	-8	0.05	0	0
P97	Gila River Zone	J84	J36	552	6	100	7	0.08	0.01	0.01
P99	Gila River Zone	J82	J84	447	8	100	14	0.09	0.01	0.01

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
10716		Zone 1	7	955	1164	91
10720		Zone 1	3	958	1164	89
10982	45	Gila River Zone	48	944	1098	66
11034		Zone 1	5	956	1164	90
18488		Zone 1	9	951	1164	92
18530		Zone 1	3	961	1164	88
18536		Zone 1	7	961	1164	88
18542		Zone 1	18	956	1164	90
18594		Zone 1	4	959	1164	89
18610		Zone 1	5	959	1164	89
18630		Zone 1	9	965	1164	86
18632		Zone 1	5	957	1164	90
18666		Zone 1	5	961	1164	88
18796		Zone 1	2	955	1164	91
18818		Zone 1	3	955	1164	91
18828		Zone 1	1	975	1164	82
19302	44	Gila River Zone	75	935	1097	70
19990		Zone 1	2	966	1164	86
20004		Zone 1	1	955	1164	91
20006		Zone 1	1	964	1164	87
20014		Zone 1	2	969	1164	85
20020		Zone 1	1	975	1164	82
20028	46	Zone 1	1	971	1164	84
20030		Zone 1	4	967	1164	86
20034		Zone 1	7	960	1164	88
20038		Zone 1	7	971	1164	84
20050		Zone 1	5	968	1164	85
20052		Zone 1	1	966	1164	86
20060		Zone 1	10	967	1164	86
20076		Zone 1	0	968	1164	85
20086		Zone 1	4	961	1164	88
20090		Zone 1	4	965	1164	86

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
22682	31	Gila River Zone	70	940	1098	68
22684		Gila River Zone	0	927	1097	73
22686		Gila River Zone	0	925	1097	75
22688	38	Gila River Zone	93	915	1097	79
22690		Gila River Zone	0	926	1097	74
22692	35	Gila River Zone	35	944	1097	67
22694	36	Gila River Zone	15	935	1097	70
22696	40	Gila River Zone	28	928	1097	74
22698	22	Zone 1	22	989	1165	76
22810	50	Zone 1	0	967	1164	85
22816		Zone 1	0	1005	1164	69
22818	3	Gila River Zone	28	910	1097	81
22820	41	Gila River Zone	163	905	1097	83
22822		Gila River Zone	0	930	1097	72
22824	53	Gila River Zone	38	895	1097	87
22826	1	Gila River Zone	56	896	1097	87
22828	51	Gila River Zone	112	905	1097	83
22830	52	Gila River Zone	112	905	1097	83
22832	42	Gila River Zone	0	905	1097	83
22834		Gila River Zone	0	912	1097	80
22836	28	Zone 1	137	955	1164	91
22838	29	Zone 1	75	965	1164	86
22842	23	Zone 1	92	995	1164	73
22876		Zone 1	0	1025	1164	60
23518	16	Zone 1	121	1015	1164	64
23520	26.1	Zone 1	88	959	1164	89
23522		Zone 1	0	983	1165	79
23524		Zone 1	0	975	1164	82
23526		Zone 1	0	980	1164	80
23998	32	Gila River Zone	129	952	1098	63
24070		Zone 1	0	1019	1164	63
24072		Zone 1	0	1014	1164	65

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
3290	49	Zone 1	0	992	1164	74
66		Zone 1	3	972	1164	83
6748		Zone 1	12	954	1164	91
70		Zone 1	4	971	1164	84
9690		Zone 1	6	954	1164	91
9702		Zone 1	5	959	1164	89
9710		Zone 1	3	960	1164	88
9718		Zone 1	3	960	1164	88
9726		Zone 1	9	962	1164	87
9732		Zone 1	7	964	1164	87
9738		Zone 1	5	962	1164	88
9744		Zone 1	8	966	1164	86
J10	37	Gila River Zone	112	918	1097	78
J100		Gila River Zone	0	939	1097	69
J102		Gila River Zone	0	938	1097	69
J104		Gila River Zone	0	926	1097	74
J106		Gila River Zone	0	928	1097	73
J108		Gila River Zone	0	930	1097	72
J110		Gila River Zone	0	930	1097	72
J112		Gila River Zone	0	928	1097	73
J114		Gila River Zone	0	928	1097	73
J116		Gila River Zone	0	931	1097	72
J118		Gila River Zone	0	934	1097	71
J12		Gila River Zone	0	926	1097	74
J120		Gila River Zone	0	934	1097	71
J14		Gila River Zone	0	919	1097	77
J16		Gila River Zone	0	924	1097	75
J18		Gila River Zone	0	924	1097	75
J20		Gila River Zone	0	920	1097	77
J22		Gila River Zone	0	917	1097	78
J24		Gila River Zone	0	918	1097	78
J26		Gila River Zone	0	919	1097	77

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J28		Gila River Zone	0	922	1097	76
J3160	39	Gila River Zone	35	913	1097	80
J3164	21	Zone 1	15	988	1165	77
J3166	19	Zone 1	43	994	1164	74
J3168	18	Zone 1	82	1010	1164	67
J3170	18.1	Zone 1	43	999	1164	71
J3172	34	Gila River Zone	44	927	1097	74
J3174	33	Gila River Zone	82	920	1097	77
J3176	2	Gila River Zone	112	906	1097	83
J3180	4	Gila River Zone	87	925	1097	75
J3182	12	Zone 1	26	1000	1164	71
J3184	17	Zone 1	60	1012	1164	66
J3186	30	Zone 1	37	952	1164	92
J32		Gila River Zone	0	921	1097	76
J3202	45.1	Zone 1	19	950	1164	93
J3204		Zone 1	0	944	1164	95
J3206		Zone 1	0	943	1164	96
J3208		Zone 1	0	940	1164	97
J3210		Gila River Zone	0	924	1097	75
J3212		Gila River Zone	0	938	1097	69
J3214	5.1	Zone 1	23	954	1164	91
J3216		Gila River Zone	0	917	1097	78
J3218		Gila River Zone	0	921	1097	76
J3220		Gila River Zone	0	922	1097	76
J3222		Zone 1	0	944	1164	95
J3224	43	Gila River Zone	0	910	1097	81
J3226		Gila River Zone	0	944	1098	67
J3228		Gila River Zone	0	934	1097	71
J34		Gila River Zone	0	942	1097	67
J36		Gila River Zone	0	932	1097	72
J38		Gila River Zone	0	932	1097	72
J40		Gila River Zone	0	925	1097	75

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J418		Zone 1	0	975	1164	82
J42		Gila River Zone	0	926	1097	74
J420		Zone 1	3	975	1164	82
J422		Zone 1	3	980	1164	80
J424		Zone 1	1	979	1164	80
J426		Zone 1	0	981	1164	79
J428		Zone 1	0	982	1164	79
J430		Zone 1	3	983	1164	79
J432		Zone 1	23	980	1164	80
J434		Zone 1	0	980	1164	80
J436		Zone 1	0	981	1164	79
J438		Zone 1	0	977	1164	81
J44		Gila River Zone	0	930	1097	72
J440	47	Zone 1	1	983	1164	78
J442		Zone 1	1	985	1164	78
J444		Zone 1	0	989	1164	76
J446		Zone 1	0	984	1164	78
J448		Zone 1	3	988	1164	76
J450		Zone 1	3	987	1164	77
J452		Zone 1	3	985	1164	78
J454		Zone 1	2	983	1164	78
J456		Zone 1	3	987	1164	77
J458		Zone 1	2	984	1164	78
J46		Gila River Zone	0	930	1097	72
J460		Zone 1	1	990	1164	75
J462		Zone 1	0	992	1164	74
J464		Zone 1	0	993	1164	74
J468		Zone 1	0	994	1164	74
J470		Zone 1	0	995	1164	73
J472		Zone 1	0	994	1164	74
J474		Zone 1	0	993	1164	74
J476		Zone 1	1	993	1164	74

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J48		Gila River Zone	0	926	1097	74
J480		Zone 1	3	992	1164	74
J482		Zone 1	2	993	1164	74
J484		Zone 1	4	992	1164	74
J486		Zone 1	4	990	1164	75
J488		Zone 1	0	990	1164	75
J490		Zone 1	3	986	1164	77
J492		Zone 1	5	989	1164	76
J494		Zone 1	3	987	1164	77
J496		Zone 1	3	986	1164	77
J498		Zone 1	3	984	1164	78
J50		Gila River Zone	0	929	1097	73
J502		Zone 1	1	988	1164	76
J52		Gila River Zone	0	930	1097	72
J54		Gila River Zone	0	928	1097	73
J60		Gila River Zone	0	929	1097	73
J64		Gila River Zone	0	929	1097	73
J66		Gila River Zone	0	940	1097	68
J68		Gila River Zone	0	939	1097	69
J690		Gila River Zone	0	937	1097	69
J692		Gila River Zone	0	929	1097	73
J70		Gila River Zone	0	934	1097	71
J72		Gila River Zone	0	934	1097	71
J78		Gila River Zone	0	937	1097	69
J80		Gila River Zone	0	936	1097	70
J82		Gila River Zone	0	934	1097	71
J84		Gila River Zone	0	932	1097	72
J88		Gila River Zone	0	936	1097	70
J90		Gila River Zone	0	938	1097	69
J92		Gila River Zone	0	934	1097	71
J94		Gila River Zone	0	935	1097	70
J96		Gila River Zone	0	935	1097	70

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J98		Gila River Zone	0	937	1097	69

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
101	Zone 1	22676	22836	1,294	16	140	438	0.7	0.15	0.12
103	Gila River Zone	22678	J34	1,290	16	120	-298	0.48	0.1	0.08
105	Gila River Zone	22680	22682	2,663	16	125	-810	1.29	1.21	0.45
109	Gila River Zone	22684	J22	818	12	120	-56	0.16	0.01	0.01
111	Gila River Zone	22686	J10	1,112	12	120	25	0.07	0	0
113	Gila River Zone	22682	J3174	2,642	16	125	995	1.59	1.76	0.66
117	Gila River Zone	22690	22692	1,460	12	120	-97	0.27	0.06	0.04
119	Gila River Zone	22692	J3228	1,233	12	120	-156	0.44	0.12	0.09
121	Gila River Zone	22694	22696	1,179	12	120	250	0.71	0.27	0.23
123	Gila River Zone	22696	19302	792	12	120	128	0.36	0.05	0.06
1585	Zone 1	23518	22816	2,303	12	120	-253	0.72	0.53	0.23
1593	Zone 1	22698	22842	2,701	12	120	473	1.34	1.99	0.74
1597	Zone 1	23520	22676	2,604	12	120	-239	0.68	0.54	0.21
1603	Zone 1	23522	22672	1,412	24	140	1889	1.34	0.35	0.25
1605	Zone 1	23524	J418	413	12	120	100	0.28	0.02	0.04
1609	Zone 1	23526	J432	413	12	120	120	0.34	0.02	0.06
20408A	Zone 1	6748	18488	801	6	100	9	0.11	0.02	0.02
2421	Gila River Zone	22684	J3180	1,279	12	120	-119	0.34	0.07	0.06
2429	Gila River Zone	23998	22682	1,994	16	120	-513	0.82	0.42	0.21
2431	Gila River Zone	23998	J3226	1,865	16	120	513	0.82	0.39	0.21
2601	Zone 1	24070	24072	1,526	12	120	-57	0.16	0.02	0.01
2605	Zone 1	24072	3290	3,858	12	120	-57	0.16	0.06	0.01
275	Zone 1	3290	22648	1,465	24	130	-57	0.04	0	0
277	Zone 1	22698	23522	1,231	24	140	1889	1.34	0.3	0.25
279	Zone 1	22670	22672	1,328	12	125	-363	1.03	0.56	0.42
281	Zone 1	20020	22672	2,647	16	125	-739	1.18	1.01	0.38
293	Zone 1	22674	J3214	1,189	12	120	39	0.11	0.01	0.01
295	Gila River Zone	22684	22818	1,316	12	120	175	0.5	0.15	0.12
299	Gila River Zone	22826	22828	5,264	12	120	54	0.15	0.07	0.01
29F2B7	Zone 1	20028	22810	1,388	24	130	0	0	0	0
2B539	Zone 1	19990	20090	172	8	110	56	0.36	0.02	0.12
2B5CF	Zone 1	18542	18796	191	8	110	-67	0.43	0.03	0.17
2B5D2	Zone 1	18796	6748	170	8	110	46	0.29	0.01	0.08
2B5EF	Zone 1	18796	20350	839	24	130	-181	0.13	0	0
2B624	Zone 1	20350	18610	170	8	110	52	0.33	0.02	0.1
2B627	Zone 1	18666	20350	189	8	110	-78	0.5	0.04	0.22
2B62A	Zone 1	20350	20004	700	24	130	-315	0.22	0.01	0.01

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
2B64A	Zone 1	20344	20004	154	6	100	0	0	0	0
2B6A2	Zone 1	19990	20014	861	24	130	-498	0.35	0.02	0.02
2B6A5	Zone 1	20014	20028	499	24	130	-635	0.45	0.02	0.04
2B6CA	Zone 1	20326	20014	70	8	110	-119	0.76	0.03	0.49
2B7B6	Zone 1	20260	20290	549	6	100	-62	0.71	0.39	0.71
2B7CE	Zone 1	20274	20290	547	6	100	-51	0.57	0.26	0.48
2B7D4	Zone 1	20290	20326	117	8	110	-115	0.73	0.05	0.45
2B7E9	Zone 1	20264	20286	439	6	100	30	0.33	0.08	0.18
2B7EC	Zone 1	20286	20256	611	6	100	0	0	0	0
2B861	Zone 1	20264	20274	440	6	100	-1	0.02	0	0
2B8A9	Zone 1	20286	20260	881	6	100	16	0.18	0.05	0.05
2B8BB	Zone 1	20274	20256	269	6	100	39	0.44	0.08	0.29
2B8F9	Zone 1	20256	20260	269	6	100	30	0.34	0.05	0.18
2B866	Zone 1	70	20038	170	6	100	14	0.16	0.01	0.04
2B86C	Zone 1	20038	20264	269	6	100	36	0.41	0.07	0.25
2B86F	Zone 1	70	20060	1,169	6	100	-26	0.29	0.16	0.14
2B87E	Zone 1	20060	18828	680	6	100	-11	0.12	0.02	0.03
2B88B	Zone 1	20030	19990	186	8	110	-98	0.62	0.06	0.34
2B891	Zone 1	20038	20030	891	6	100	-33	0.38	0.2	0.22
2B897	Zone 1	20060	20222	353	8	110	-15	0.09	0	0.01
2B89D	Zone 1	20050	20222	307	8	110	27	0.17	0.01	0.03
2B8A0	Zone 1	20222	20050	562	6	100	-8	0.09	0.01	0.02
2B8AC	Zone 1	20030	20050	258	8	110	43	0.27	0.02	0.07
2C1AC	Zone 1	18594	20034	270	8	110	-9	0.06	0	0
2C1B2	Zone 1	20034	20118	611	8	110	-10	0.06	0	0
2C1C4	Zone 1	20086	20176	626	6	100	-8	0.09	0.01	0.02
2C1CE	Zone 1	2,02E+04	18818	233	6	100	-6	0.06	0	0.01
2C1D7	Zone 1	18818	20086	426	6	100	11	0.12	0.01	0.03
2C1EF	Zone 1	20104	20118	360	6	100	-7	0.08	0	0.01
2C210	Zone 1	20090	20104	1,282	6	100	9	0.1	0.02	0.02
2C21D	Zone 1	20014	20076	171	8	110	15	0.09	0	0.01
2C220	Zone 1	20156	20076	459	8	110	-12	0.07	0	0.01
2C223	Zone 1	20076	20158	422	8	110	3	0.02	0	0
2C2DE	Zone 1	20006	18818	172	6	100	21	0.24	0.02	0.09
2C91E	Zone 1	20090	20118	449	8	110	33	0.21	0.02	0.04
2C924	Zone 1	20104	20034	1,006	6	100	-2	0.03	0	0
2C930	Zone 1	20176	20090	270	6	100	-7	0.08	0	0.01

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
2C937	Zone 1	20086	20034	270	6	100	12	0.14	0.01	0.04
2C95A	Zone 1	20052	20030	234	6	100	-15	0.16	0.01	0.05
2C9A6	Zone 1	20004	20006	192	24	130	-317	0.22	0	0.01
2C9BB	Zone 1	19990	20006	539	24	130	340	0.24	0.01	0.01
301	Gila River Zone	22828	22830	849	12	120	43	0.12	0.01	0.01
303	Gila River Zone	22830	22824	2,392	24	120	-148	0.1	0.01	0
305	Gila River Zone	22688	22820	1,511	16	125	451	0.72	0.23	0.15
307	Gila River Zone	22820	22828	3,294	12	120	179	0.51	0.4	0.12
311	Gila River Zone	22822	3160	818	12	120	267	0.76	0.21	0.25
313	Gila River Zone	22822	22696	1,655	12	120	-75	0.21	0.04	0.02
315	Gila River Zone	22818	22834	2,599	24	125	-164	0.12	0.01	0
317	Gila River Zone	22834	22820	2,599	24	130	11	0.01	0	0
319	Gila River Zone	22834	J10	1,433	12	120	-175	0.5	0.17	0.12
321	Gila River Zone	22824	22832	1,628	12	120	-121	0.34	0.1	0.06
323	Zone 1	22836	3208	982	16	140	49	0.08	0	0
32324	Zone 1	18796	3202	840	24	130	65	0.05	0	0
327	Zone 1	22836	22838	1,602	12	120	158	0.45	0.15	0.1
329	Zone 1	22838	3186	976	12	120	30	0.09	0	0
331	Zone 1	22664	22842	2,517	12	120	-149	0.42	0.22	0.09
335	Zone 1	22816	22652	366	12	120	-253	0.72	0.08	0.23
353	Gila River Zone	22824	3224	2,827	24	125	-91	0.06	0	0
35ACD	Zone 1	9738	18666	261	8	110	-42	0.27	0.02	0.07
35B3D	Zone 1	20060	9744	269	8	110	-16	0.1	0	0.01
35E89	Zone 1	18666	9744	954	6	100	12	0.14	0.03	0.04
35F26	Zone 1	9738	9732	567	6	100	8	0.09	0.01	0.01
35FF8	Zone 1	18610	18632	466	8	110	23	0.14	0.01	0.02
36080	Zone 1	18630	18632	532	6	100	-3	0.04	0	0
36095	Zone 1	18630	18594	337	8	110	-1	0.01	0	0
36098	Zone 1	186E+04	18630	301	8	110	11	0.07	0	0.01
361FD	Zone 1	9718	9710	662	6	100	-3	0.04	0	0
362E0	Zone 1	18594	9718	270	6	100	-1	0.01	0	0
36497	Zone 1	18610	10716	931	6	100	8	0.1	0.02	0.02
364F9	Zone 1	10716	9690	270	6	100	0	0	0	0
366FB	Zone 1	9702	18530	310	6	100	5	0.06	0	0.01
36879	Zone 1	11034	10720	269	6	100	5	0.06	0	0.01
368E7	Zone 1	1.10E+04	18542	691	6	100	-18	0.2	0.05	0.07
36919	Zone 1	18542	9702	600	6	100	19	0.22	0.05	0.08

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
36956	Zone 1	11034	18536	749	6	100	5	0.05	0	0.01
36959	Zone 1	18536	18530	439	6	100	-4	0.04	0	0
36990	Zone 1	10720	18536	480	6	100	4	0.05	0	0
36AD9	Zone 1	973E+03	18530	269	6	100	4	0.05	0	0
36AFA	Zone 1	6748	9690	786	6	100	9	0.11	0.02	0.02
36BCF	Zone 1	9690	18488	587	6	100	-1	0.01	0	0
391E08	Zone 1	70	66	178	6	100	4	0.05	0	0.01
411	Zone 1	22876	23518	2,595	12	120	57	0.16	0.04	0.01
413	Zone 1	22876	24070	5,276	12	120	-57	0.16	0.08	0.01
593	Zone 1	20052	18828	57	6	100	12	0.14	0	0.03
69	Zone 1	20028	23524	1,486	12	120	100	0.28	0.06	0.04
71	Zone 1	2,26E+04	J3166	288	24	130	187	0.13	0	0
73	Zone 1	22652	22650	2,698	12	120	205	0.58	0.42	0.16
75	Zone 1	22652	J3164	2,218	12	120	-566	1.61	2.27	1.03
77	Zone 1	22652	22656	2,296	12	120	-64	0.18	0.04	0.02
79	Zone 1	22656	22658	394	12	120	-87	0.25	0.01	0.03
83	Zone 1	2,27E+04	22662	987	12	120	18	0.05	0	0
85	Zone 1	22654	22662	1,480	12	120	26	0.07	0.01	0
87	Zone 1	22654	22664	1,100	12	120	-70	0.2	0.02	0.02
89	Zone 1	22664	22666	2,616	12	120	-27	0.08	0.01	0
8B1A3	Zone 1	9710	18610	270	6	100	-13	0.14	0.01	0.04
8B1B5	Zone 1	9726	18666	903	6	100	-14	0.16	0.04	0.05
8B397	Zone 1	10720	9702	269	6	100	-5	0.06	0	0.01
8B39A	Zone 1	10716	18594	1,422	6	100	-3	0.04	0	0
8CA72	Zone 1	20020	20028	1,309	24	130	737	0.52	0.06	0.05
8CB0B	Zone 1	9744	9726	1,339	6	100	5	0.05	0.01	0.01
8CB0E	Zone 1	9744	9732	348	8	110	-21	0.14	0.01	0.02
8CB14	Zone 1	9732	9738	281	8	110	-26	0.17	0.01	0.03
8CB29	Zone 1	9710	9718	656	6	100	3	0.04	0	0
8CB54	Zone 1	6748	18488	1,299	6	100	7	0.08	0.02	0.01
91	Zone 1	22666	22668	2,538	12	120	-214	0.61	0.43	0.17
93	Zone 1	22668	22670	1,341	12	125	-363	1.03	0.56	0.42
95	Zone 1	22666	22674	2,634	12	120	52	0.15	0.03	0.01
97	Zone 1	22674	23520	2,678	12	120	-138	0.39	0.2	0.08
99	Zone 1	22672	22676	2,628	16	140	749	1.19	0.84	0.32
P101	Gila River Zone	J88	J80	325	8	100	-10	0.07	0	0.01
P103	Gila River Zone	J90	J94	298	8	100	10	0.07	0	0.01

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P105	Gila River Zone	J88	J90	954	8	100	6	0.04	0	0
P107	Gila River Zone	J92	J72	292	8	100	-13	0.08	0	0.01
P109	Gila River Zone	J94	J70	273	8	100	10	0.06	0	0.01
P111	Gila River Zone	J10	22688	2,594	12	120	-76	0.22	0.07	0.03
P113	Gila River Zone	J92	J94	973	8	100	0	0	0	0
P115	Gila River Zone	J96	J690	1,028	8	100	-23	0.14	0.03	0.03
P117	Gila River Zone	J96	J98	295	8	100	-18	0.12	0.01	0.02
P119	Gila River Zone	J100	J98	803	8	100	18	0.12	0.01	0.02
P121	Gila River Zone	J102	J100	2,012	8	100	5	0.03	0	0
P123	Gila River Zone	J100	J102	326	8	100	-13	0.08	0	0.01
P125	Gila River Zone	J104	J692	1,241	8	100	7	0.05	0	0
P127	Gila River Zone	J104	J106	295	8	100	-7	0.05	0	0
P129	Gila River Zone	J108	J112	296	8	100	7	0.05	0	0
P131	Gila River Zone	J110	J116	751	8	100	-10	0.06	0	0.01
P133	Gila River Zone	J12	J3220	692	8	120	82	0.52	0.14	0.2
P135	Gila River Zone	J108	J110	247	8	100	4	0.03	0	0
P137	Gila River Zone	J112	J106	299	8	100	7	0.05	0	0
P139	Gila River Zone	J112	J114	352	8	100	0	0	0	0
P141	Gila River Zone	J116	J108	542	8	100	11	0.07	0	0.01
P143	Gila River Zone	J116	J120	222	8	100	-21	0.13	0.01	0.02
P145	Gila River Zone	J118	22678	1,447	12	120	-248	0.7	0.32	0.22
P15	Gila River Zone	J120	J96	354	8	100	-41	0.26	0.03	0.08
P1673	Gila River Zone	J14	J28	717	6	100	0	0.01	0	0
P1675	Gila River Zone	J3160	22832	1,828	12	120	212	0.6	0.3	0.17
P1677	Gila River Zone	22820	J3160	3,184	12	120	5	0.01	0	0
P1679	Gila River Zone	22832	J3224	2,698	12	120	91	0.26	0.09	0.03
P1681	Zone 1	J10	22680	3,887	12	120	-264	0.75	0.97	0.25
P1683	Zone 1	22842	J3182	2,240	12	120	168	0.48	0.24	0.11
P1685	Zone 1	J3164	22698	424	24	120	-592	0.42	0.02	0.04
P1687	Zone 1	J3166	22650	839	24	130	-96	0.07	0	0
P1689	Zone 1	J3166	J3170	990	12	120	210	0.59	0.16	0.16
P1691	Zone 1	J3168	J3184	1,530	12	120	-3	0.01	0	0
P1693	Gila River Zone	J3170	J3168	1,670	12	120	137	0.39	0.12	0.07
P1695	Gila River Zone	J3172	22690	666	12	120	-97	0.27	0.03	0.04
P1697	Gila River Zone	J3174	22688	1,070	16	125	685	1.09	0.36	0.33
	Gila River Zone	J3172	J3174	1,059	12	100	-170	0.48	0.16	0.15

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P31	Gila River Zone	J28	J16	297	6	100	0	0	0	0
P33	Gila River Zone	J28	J32	930	6	100	0	0	0	0
P35	Gila River Zone	J32	J26	443	6	100	0	0	0	0
P37	Gila River Zone	J32	J3216	877	6	100	0	0	0	0
P39	Gila River Zone	J34	J2680	1,317	16	120	-400	0.64	0.17	0.13
P41	Gila River Zone	J34	J78	821	8	100	101	0.65	0.35	0.43
P43	Gila River Zone	J38	J84	331	6	100	-12	0.13	0.01	0.03
P45	Gila River Zone	J36	J44	285	6	100	11	0.13	0.01	0.03
P47	Gila River Zone	J38	J46	285	6	100	12	0.13	0.01	0.03
P49	Gila River Zone	J40	J48	626	6	100	-7	0.08	0.01	0.01
P501	Zone 1	J418	J2526	675	12	120	120	0.34	0.04	0.06
P503	Zone 1	J418	J420	204	8	120	-20	0.13	0	0.01
P505	Zone 1	J420	J422	1,044	8	120	-17	0.11	0.01	0.01
P507	Zone 1	J422	J424	310	8	120	10	0.06	0	0
P509	Zone 1	J424	J420	1,080	6	120	7	0.08	0.01	0.01
P51	Gila River Zone	J44	J60	256	6	100	16	0.18	0.01	0.06
P511	Zone 1	J422	J426	272	8	120	-32	0.21	0.01	0.04
P513	Zone 1	J426	J428	280	8	120	-53	0.34	0.03	0.09
P515	Zone 1	J428	J430	174	8	120	-87	0.56	0.04	0.23
P517	Zone 1	J432	J440	422	12	120	136	0.39	0.03	0.07
P519	Zone 1	J432	J434	184	12	100	-55	0.16	0	0.02
P521	Zone 1	J434	J428	665	6	120	-34	0.39	0.11	0.17
P523	Zone 1	J436	J434	240	12	100	0	0	0	0
P525	Zone 1	J434	J438	356	6	120	-21	0.23	0.02	0.07
P527	Zone 1	J438	J426	930	6	120	-21	0.23	0.06	0.07
P529	Zone 1	J440	J458	291	12	120	348	0.99	0.12	0.42
P53	Gila River Zone	J46	J50	290	6	100	7	0.07	0	0.01
P531	Zone 1	J430	J440	584	12	120	300	0.85	0.18	0.32
P533	Zone 1	J442	J490	185	12	120	276	0.78	0.05	0.27
P535	Zone 1	J444	J460	531	12	120	314	0.89	0.18	0.34
P537	Zone 1	J444	J448	216	8	120	-95	0.61	0.06	0.27
P539	Zone 1	J448	J450	302	8	120	-96	0.62	0.08	0.28
P541	Zone 1	J450	J452	339	8	120	-76	0.48	0.06	0.18
P543	Zone 1	J452	J446	347	8	120	-52	0.33	0.03	0.09
P545	Zone 1	J446	J454	614	8	120	-52	0.33	0.05	0.09
P547	Zone 1	J454	J452	681	6	120	29	0.33	0.09	0.12
P549	Zone 1	J454	J440	191	8	120	-85	0.55	0.04	0.22

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/sft)
P55	Gila River Zone	J44	J52	279	6	100	-5	0.05	0	0.01
P551	Zone 1	J442	J450	596	8	120	25	0.16	0.01	0.02
P553	Zone 1	J456	J502	98	12	120	281	0.8	0.03	0.28
P555	Zone 1	J456	J448	312	8	120	4	0.02	0	0
P557	Zone 1	J458	J442	163	12	120	304	0.86	0.05	0.32
P559	Zone 1	J460	J462	346	12	120	303	0.86	0.11	0.32
P561	Zone 1	J462	J464	303	12	120	282	0.8	0.09	0.28
P563	Zone 1	J464	J2648	251	12	120	346	0.98	0.1	0.41
P565	Zone 1	J464	J468	431	8	120	-64	0.41	0.06	0.13
P567	Zone 1	J468	J470	606	6	120	-18	0.2	0.03	0.05
P569	Zone 1	J470	J472	277	6	120	-18	0.2	0.01	0.05
P57	Gila River Zone	J48	J42	279	6	100	-3	0.04	0	0
P571	Zone 1	J472	J474	289	6	120	-18	0.2	0.01	0.05
P573	Zone 1	J474	J476	317	6	120	28	0.32	0.04	0.11
P577	Zone 1	J476	J462	413	8	120	-21	0.13	0.01	0.02
P579	Zone 1	J460	J480	637	8	120	10	0.06	0	0
P581	Zone 1	J480	J482	260	8	120	-41	0.26	0.02	0.06
P583	Zone 1	J482	J484	261	8	120	-45	0.29	0.02	0.07
P585	Zone 1	J484	J486	538	8	120	-52	0.33	0.05	0.09
P589	Zone 1	J486	J488	249	8	120	1	0	0	0
P59	Gila River Zone	J50	J42	507	6	100	3	0.04	0	0
P591	Zone 1	J490	J456	160	12	120	290	0.82	0.05	0.3
P593	Zone 1	J490	J492	685	6	120	-18	0.21	0.04	0.05
P595	Zone 1	J492	J494	340	6	120	-26	0.3	0.04	0.1
P597	Zone 1	J494	J496	329	8	120	-17	0.11	0	0.01
P599	Zone 1	J496	J498	950	8	120	-23	0.15	0.02	0.02
P601	Zone 1	J498	J458	166	8	120	-42	0.27	0.01	0.06
P605	Zone 1	J494	J498	713	6	120	-14	0.16	0.02	0.03
P607	Zone 1	J502	J444	178	12	120	219	0.62	0.03	0.18
P609	Zone 1	J486	J502	1,150	8	120	-61	0.39	0.14	0.12
P61	Gila River Zone	J48	J54	302	6	100	-4	0.04	0	0
P611	Zone 1	J480	J474	278	6	120	46	0.52	0.08	0.28
P613	Zone 1	J476	J468	306	8	120	46	0.3	0.02	0.07
P63	Gila River Zone	J52	J46	615	6	100	-5	0.06	0	0.01
P65	Gila River Zone	J54	J50	462	6	100	-3	0.04	0	0
P67	Gila River Zone	J52	J54	749	6	100	1	0.01	0	0
P71	Gila River Zone	J60	J40	524	6	100	-7	0.08	0.01	0.01

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P75	Gila River Zone	J64	J12	457	8	100	82	0.52	0.13	0.29
P77	Gila River Zone	J64	J60	194	6	100	-23	0.26	0.02	0.11
P79	Gila River Zone	J66	J68	876	8	100	5	0.03	0	0
P81	Gila River Zone	J68	J90	289	8	100	5	0.03	0	0
P83	Gila River Zone	J70	J82	335	8	100	10	0.06	0	0.01
P831	Gila River Zone	J690	J102	258	8	100	18	0.12	0	0.02
P833	Gila River Zone	J690	J78	197	8	110	-41	0.26	0.01	0.07
P835	Gila River Zone	J692	J110	638	8	100	-14	0.09	0.01	0.01
P837	Gila River Zone	J692	J64	203	8	100	21	0.13	0	0.02
P87	Gila River Zone	J66	J88	265	8	100	-5	0.03	0	0
P89	Gila River Zone	J78	J64	1,325	8	100	37	0.24	0.09	0.07
P91	Gila River Zone	J80	J72	337	8	100	13	0.08	0	0.01
P93	Gila River Zone	J78	J80	199	8	100	23	0.15	0.01	0.03
P95	Gila River Zone	J82	J92	370	8	100	-13	0.08	0	0.01
P97	Gila River Zone	J84	J36	552	6	100	11	0.13	0.02	0.03
P99	Gila River Zone	J82	J84	447	8	100	23	0.15	0.01	0.03

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
10716		Zone 1	11	955	1163	90	1,511	58	22876
10720		Zone 1	6	958	1163	89	1,506	58	22876
10982	45	Gila River Zone	82	944	1095	65	3,082	53	23998
11034		Zone 1	8	956	1163	89	1,508	58	22876
18488		Zone 1	16	951	1163	92	1,516	58	22876
18530		Zone 1	6	961	1163	87	1,506	58	22876
18536		Zone 1	12	961	1163	88	1,512	58	22876
18542		Zone 1	30	956	1163	90	1,530	58	22876
18594		Zone 1	6	959	1163	88	1,506	58	22876
18610		Zone 1	8	959	1163	88	1,508	58	22876
18630		Zone 1	15	965	1163	86	1,515	58	22876
18632		Zone 1	9	957	1163	89	1,509	58	22876
18666		Zone 1	9	961	1163	87	1,509	58	22876
18796		Zone 1	4	955	1163	90	1,504	58	22876
18818		Zone 1	4	955	1163	90	1,504	58	22876
18828		Zone 1	1	975	1163	81	1,501	58	22876
19302	44	Gila River Zone	128	935	1093	69	1,628	59	33212
19990		Zone 1	4	966	1163	85	1,504	58	22876
20004		Zone 1	2	955	1163	90	1,502	58	22876
20006		Zone 1	2	964	1163	86	1,502	58	22876
20014		Zone 1	3	969	1163	84	1,503	58	22876
20020		Zone 1	2	975	1163	81	1,502	58	22876
20028	46	Zone 1	1	971	1163	83	1,501	58	22876
20030		Zone 1	7	967	1163	85	1,507	58	22876
20034		Zone 1	11	960	1163	88	1,511	58	22876
20038		Zone 1	11	971	1162	83	1,511	58	22876
20050		Zone 1	8	968	1163	85	1,508	58	22876
20052		Zone 1	2	966	1163	85	1,502	58	22876
20060		Zone 1	16	967	1163	85	1,516	58	22876

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
20076		Zone 1	0	968	1163	84	1,500	58	22876
20086		Zone 1	7	961	1163	87	1,507	58	22876
20090		Zone 1	7	965	1163	86	1,507	58	22876
20104		Zone 1	18	963	1163	87	1,518	58	22876
20118		Zone 1	16	964	1163	86	1,516	58	22876
20156		Zone 1	12	966	1163	85	1,512	58	22876
20158		Zone 1	3	969	1163	84	1,503	58	22876
20176		Zone 1	5	964	1163	86	1,505	58	22876
20222		Zone 1	20	968	1163	84	1,520	58	22876
20256		Zone 1	9	971	1162	83	1,509	58	22876
20260		Zone 1	108	972	1162	82	1,608	58	22876
20264		Zone 1	8	969	1162	84	1,508	58	22876
20274		Zone 1	11	970	1162	83	1,511	58	22876
20286		Zone 1	14	973	1162	82	1,514	58	22876
20290		Zone 1	2	970	1163	84	1,502	58	22876
20326		Zone 1	4	969	1163	84	1,504	58	22876
20344		Zone 1	0	963	1163	86	1,500	58	22876
20350		Zone 1	4	960	1163	88	1,504	58	22876
22648	48	Zone 1	102	1005	1162	68	3,102	50	22876
22650	20	Zone 1	109	998	1162	71	3,109	50	22876
22652	15	Zone 1	172	1000	1162	70	3,172	52	22876
22654	9	Zone 1	44	1003	1162	69	3,044	56	22876
22656	14	Zone 1	24	1003	1162	69	3,024	55	22876
22658	13	Zone 1	19	1004	1162	69	3,019	55	22876
22660	11	Zone 1	0	1003	1162	69	3,000	56	22876
22662	10	Zone 1	44	1003	1162	69	3,044	56	22876
22664	8	Zone 1	105	996	1162	72	1,605	58	22876
22666	7	Zone 1	134	980	1162	79	3,134	57	22876
22668	24	Zone 1	150	974	1163	82	3,150	57	22876

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
22670		Zone 1	0	965	1163	86	1,500	58	22876
22672	25	Zone 1	37	985	1164	77	3,037	58	22876
22674	6	Zone 1	151	963	1162	86	3,151	57	22876
22676	26	Zone 1	71	958	1163	89	3,071	58	22876
22678	5	Gila River Zone	50	945	1094	65	1,550	59	23998
22680	27	Gila River Zone	147	944	1094	65	1,647	59	23998
22682	31	Gila River Zone	119	940	1096	67	3,119	55	23998
22684		Gila River Zone	0	927	1093	72	1,500	59	23998
22686		Gila River Zone	0	925	1093	73	1,500	59	23998
22688	38	Gila River Zone	158	915	1093	77	3,158	55	23998
22690		Gila River Zone	0	926	1094	73	1,500	59	23998
22692	35	Gila River Zone	60	944	1094	65	1,560	59	23998
22694	36	Gila River Zone	26	935	1094	69	1,526	59	23998
22696	40	Gila River Zone	48	928	1093	72	1,548	59	23998
22698	22	Zone 1	37	989	1164	76	3,037	59	22876
22810	50	Zone 1	0	967	1163	85	1,500	58	22876
22816		Zone 1	0	1005	1162	68	3,000	51	22876
22818	3	Gila River Zone	0	910	1093	79	3,000	55	23998
22820	41	Gila River Zone	277	905	1093	82	3,277	55	23998
22822		Gila River Zone	0	930	1093	71	1,500	59	23998
22824	53	Gila River Zone	65	895	1093	86	3,065	55	23998
22826	1	Gila River Zone	95	896	1093	85	3,095	55	23998
22828	51	Gila River Zone	190	905	1093	81	3,190	55	23998
22830	52	Gila River Zone	190	905	1093	81	3,190	55	23998
22832	42	Gila River Zone	0	905	1093	81	3,000	55	23998
22834		Gila River Zone	0	912	1093	79	3,000	55	23998
22836	28	Zone 1	232	955	1163	90	1,732	58	22876
22838	29	Zone 1	128	965	1163	86	1,628	58	22876
22842	23	Zone 1	156	995	1162	73	3,156	56	22876

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
22876		Zone 1	0	1025	1162	59	3,000	35	22876
23518	16	Zone 1	206	1015	1162	64	3,206	45	22876
23520	26.1	Zone 1	150	959	1162	88	3,150	57	22876
23522		Zone 1	0	983	1164	78	3,000	58	22876
23524		Zone 1	0	975	1163	81	1,500	58	22876
23526		Zone 1	0	980	1163	79	1,500	57	22876
23998	32	Gila River Zone	0	952	1095	62	1,500	58	23998
24070		Zone 1	0	1019	1162	62	3,000	35	24070
24072		Zone 1	0	1014	1162	64	3,000	39	24072
3290	49	Zone 1	0	992	1162	73	3,000	50	22876
66		Zone 1	4	972	1162	83	1,504	41	66
6748		Zone 1	20	954	1163	90	1,520	58	22876
70		Zone 1	8	971	1162	83	1,508	58	22876
9690		Zone 1	10	954	1163	91	1,510	58	22876
9702		Zone 1	9	959	1163	88	1,509	58	22876
9710		Zone 1	6	960	1163	88	1,506	58	22876
9718		Zone 1	5	960	1163	88	1,505	58	22876
9726		Zone 1	15	962	1163	87	1,515	58	22876
9752		Zone 1	12	964	1163	86	1,512	58	22876
9738		Zone 1	9	962	1163	87	1,509	58	22876
9744		Zone 1	13	966	1163	85	1,513	58	22876
J10	37	Gila River Zone	190	918	1093	76	3,190	55	23998
J100		Gila River Zone	0	939	1094	67	1,500	54	J100
J102		Gila River Zone	0	938	1094	68	1,500	55	J102
J104		Gila River Zone	0	926	1094	73	1,500	56	J104
J106		Gila River Zone	0	928	1094	72	1,500	56	J106
J108		Gila River Zone	0	930	1094	71	1,500	59	23998
J110		Gila River Zone	0	930	1094	71	1,500	59	23998
J112		Gila River Zone	0	928	1094	72	1,500	58	J112

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
J114		Gila River Zone	0	928	1094	72	1,500	48	J114
J116		Gila River Zone	0	931	1094	71	1,500	59	23998
J118		Gila River Zone	0	934	1094	69	1,500	59	23998
J12		Gila River Zone	0	926	1094	73	1,500	59	23998
J120		Gila River Zone	0	934	1094	69	1,500	59	23998
J14		Gila River Zone	0	919	1093	76	1,500	22	J14
J16		Gila River Zone	0	924	1093	73	1,500	7	J16
J18		Gila River Zone	0	924	1093	73	1,500	-3	J18
J20		Gila River Zone	0	920	1093	75	1,500	17	J20
J22		Gila River Zone	0	917	1093	76	1,500	59	23998
J24		Gila River Zone	0	918	1093	76	1,500	48	J16
J26		Gila River Zone	0	919	1093	76	1,500	35	J26
J28		Gila River Zone	0	922	1093	74	1,500	19	J28
J3160	39	Gila River Zone	60	913	1093	78	1,560	59	23998
J3164	21	Zone 1	26	988	1164	76	3,026	59	22876
J3166	19	Zone 1	73	994	1162	73	3,073	50	22876
J3168	18	Zone 1	139	1010	1161	66	3,139	46	J3168
J3170	18.1	Zone 1	73	999	1162	70	3,073	50	22876
J3172	34	Gila River Zone	75	927	1094	72	1,575	59	23998
J3174	33	Gila River Zone	139	920	1094	75	3,139	55	23998
J3176	2	Gila River Zone	190	906	1093	81	3,190	55	23998
J3180	4	Gila River Zone	149	925	1093	73	1,649	59	23998
J3182	12	Zone 1	44	1000	1162	70	3,044	55	22876
J3184	17	Zone 1	102	1012	1161	65	3,102	45	J3184
J3186	30	Zone 1	63	952	1163	91	1,563	58	22876
J32		Gila River Zone	0	921	1093	75	1,500	28	J32
J3202	45.1	Zone 1	32	950	1163	92	3,032	57	22876
J3204		Zone 1	0	944	1162	95	3,000	56	J3204
J3206		Zone 1	0	943	1163	95	3,000	41	J3206

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
J3208		Zone 1	0	940	1163	97	1,500	58	22876
J3210		Gila River Zone	0	924	1093	73	1,500	28	J3212
J3212		Gila River Zone	0	938	1093	67	1,500	-19	J3212
J3214	5.1	Zone 1	39	954	1162	90	3,039	57	22876
J3216		Gila River Zone	0	917	1093	76	1,500	35	J3216
J3218		Gila River Zone	0	921	1093	75	1,500	8	J3218
J3220		Gila River Zone	0	922	1093	74	1,500	59	23998
J3222		Zone 1	0	944	1163	95	3,000	57	22876
J3224	43	Gila River Zone	0	910	1093	79	1,500	59	23998
J3226		Gila River Zone	0	944	1095	65	1,500	42	J36
J3228		Gila River Zone	0	934	1094	69	1,500	42	J38
J34		Gila River Zone	0	942	1094	66	1,500	37	J40
J36		Gila River Zone	0	932	1094	70	1,500	58	22876
J38		Gila River Zone	0	932	1094	70	1,500	33	J42
J40		Gila River Zone	0	925	1094	73	1,505	57	22876
J418		Zone 1	0	975	1163	81	1,506	57	22876
J42		Gila River Zone	0	926	1094	73	1,502	57	22876
J420		Zone 1	5	975	1163	81	1,500	57	22876
J422		Zone 1	6	980	1163	79	1,500	57	22876
J424		Zone 1	2	979	1163	80	1,506	57	22876
J426		Zone 1	0	981	1163	79	1,539	57	22876
J428		Zone 1	0	982	1163	78	1,500	57	22876
J430		Zone 1	6	983	1163	78	1,500	57	22876
J432		Zone 1	39	980	1163	79	1,500	57	22876
J434		Zone 1	0	980	1163	79	1,500	50	J44
J436		Zone 1	0	981	1163	79	1,502	57	22876
J438		Zone 1	0	977	1163	80	1,503	57	22876
J44		Gila River Zone	0	930	1094	71	1,500	57	22876
J440	47	Zone 1	2	983	1163	78	1,500	57	22876

Maximum Day Demand
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West Goodyear Central Planning Area
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
J442		Zone 1	3	985	1162	77	1,505	57	22876
J444		Zone 1	0	989	1162	75	1,504	57	22876
J446		Zone 1	0	984	1162	77	1,506	57	22876
J448		Zone 1	5	988	1162	76	1,504	57	22876
J450		Zone 1	4	987	1162	76	1,505	57	22876
J452		Zone 1	6	985	1162	77	1,503	57	22876
J454		Zone 1	4	983	1163	78	1,500	44	J46
J456		Zone 1	5	987	1162	76	1,501	56	22876
J458		Zone 1	3	984	1162	77	1,500	56	22876
J46		Gila River Zone	0	930	1094	71	1,500	56	22876
J460		Zone 1	1	990	1162	75	1,500	56	22876
J462		Zone 1	0	992	1162	74	1,500	54	J470
J464		Zone 1	0	993	1162	73	1,500	56	22876
J468		Zone 1	0	994	1162	73	1,500	56	22876
J470		Zone 1	0	995	1162	72	1,502	56	22876
J472		Zone 1	0	994	1162	73	1,500	40	J48
J474		Zone 1	0	993	1162	73	1,506	56	22876
J476		Zone 1	2	993	1162	73	1,504	56	22876
J48		Gila River Zone	0	926	1094	73	1,507	56	22876
J480		Zone 1	6	992	1162	74	1,508	57	22876
J482		Zone 1	4	993	1162	73	1,501	57	22876
J484		Zone 1	7	992	1162	74	1,505	57	22876
J486		Zone 1	8	990	1162	75	1,508	57	22876
J488		Zone 1	1	990	1162	75	1,505	57	22876
J490		Zone 1	5	986	1162	76	1,506	57	22876
J492		Zone 1	8	989	1162	75	1,505	57	22876
J494		Zone 1	5	987	1162	76	1,500	40	J50
J496		Zone 1	6	986	1162	76	1,502	57	22876
J498		Zone 1	5	984	1162	77	1,500	58	22876

Maximum Day Demand
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
J50		Gila River Zone	0	929	1094	71	1,500	45	J52
J502		Zone 1	2	988	1162	76	1,500	39	J54
J52		Gila River Zone	0	930	1094	71	1,500	59	23998
J54		Gila River Zone	0	928	1094	72	1,500	49	J66
J60		Gila River Zone	0	929	1094	71	1,500	49	J68
J64		Gila River Zone	0	929	1094	71	1,500	58	J100
J66		Gila River Zone	0	940	1094	67	1,500	59	23998
J68		Gila River Zone	0	939	1094	67	1,500	53	J70
J690		Gila River Zone	0	937	1094	68	1,500	55	J72
J692		Gila River Zone	0	929	1094	71	1,500	59	J66
J70		Gila River Zone	0	934	1094	69	1,500	56	J66
J72		Gila River Zone	0	934	1094	69	1,500	54	J82
J78		Gila River Zone	0	937	1094	68	1,500	52	J84
J80		Gila River Zone	0	936	1094	68	1,500	52	J66
J82		Gila River Zone	0	934	1094	69	1,500	52	J90
J84		Gila River Zone	0	932	1094	70	1,500	55	J92
J88		Gila River Zone	0	936	1094	68	1,500	54	J94
J90		Gila River Zone	0	938	1094	68	1,500	59	J98
J92		Gila River Zone	0	934	1094	69	1,500	55	J98
J94		Gila River Zone	0	935	1094	69	1,500	57	22876
J96		Gila River Zone	0	935	1094	69	1,500	57	22876
J98		Gila River Zone	0	937	1094	68	1,500	57	22876

Peak Hour Demand
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West Goodyear Central Planning Area
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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
101	Zone 1	22676	22836	1,294	16	140	745	1.19	0.41	0.32
103	Gila River Zone	22678	J34	1,290	16	120	-528	0.84	0.29	0.22
105	Gila River Zone	22680	22682	2,663	16	125	-1,431	2.28	3.47	1.3
109	Gila River Zone	22684	J22	818	12	120	-100	0.28	0.03	0.04
111	Gila River Zone	22686	J10	1,112	12	120	46	0.13	0.01	0.01
113	Gila River Zone	22682	J3174	2,642	16	125	1,774	2.83	5.13	1.94
117	Gila River Zone	22690	22692	1,460	12	120	-130	0.37	0.1	0.07
119	Gila River Zone	22692	J3228	1,233	12	120	-231	0.66	0.24	0.2
121	Gila River Zone	22694	22696	1,179	12	120	404	1.15	0.65	0.55
123	Gila River Zone	22696	19302	792	12	120	217	0.61	0.14	0.17
1585	Zone 1	23518	22816	2,303	12	120	-430	1.22	1.42	0.62
1593	Zone 1	22698	22842	2,701	12	120	805	2.28	5.31	1.97
1597	Zone 1	23520	22676	2,604	12	120	-407	1.15	1.45	0.56
1603	Zone 1	23522	22672	1,412	24	140	3,211	2.28	0.93	0.66
1605	Zone 1	23524	J418	413	12	120	171	0.48	0.05	0.11
1609	Zone 1	23526	J432	413	12	120	204	0.58	0.06	0.15
20408A	Zone 1	6748	18488	801	6	100	16	0.18	0.04	0.06
2421	Gila River Zone	22684	J3180	1,279	12	120	-226	0.64	0.24	0.19
2429	Gila River Zone	23998	22682	1,994	16	120	-1,244	1.99	2.16	1.09
2431	Gila River Zone	23998	J3226	1,865	16	120	872	1.39	1.05	0.56
2601	Zone 1	24070	24072	1,526	12	120	-97	0.28	0.06	0.04
2605	Zone 1	24072	3290	3,858	12	120	-97	0.28	0.15	0.04
275	Zone 1	3290	22648	1,465	24	130	-97	0.07	0	0
277	Zone 1	22698	23522	1,231	24	140	3,211	2.28	0.81	0.65
279	Zone 1	22670	22672	1,328	12	125	-618	1.75	1.49	1.12
281	Zone 1	20020	22672	2,647	16	125	-1,256	2	2.71	1.02
293	Zone 1	22674	J3214	1,189	12	120	67	0.19	0.02	0.02
295	Gila River Zone	22684	22818	1,316	12	120	326	0.92	0.49	0.37
299	Gila River Zone	22826	22828	5,264	12	120	91	0.26	0.18	0.03
29F2B7	Zone 1	20028	22810	1,388	24	130	0	0	0	0
2B539	Zone 1	19990	20090	172	8	110	96	0.61	0.06	0.32

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
2B5CF	Zone 1	18542	18796	191	8	110	-114	0.73	0.08	0.44
2B5D2	Zone 1	18796	6748	170	8	110	77	0.49	0.04	0.22
2B5HF	Zone 1	18796	20350	839	24	130	-308	0.22	0.01	0.01
2B624	Zone 1	20350	18610	170	8	110	88	0.56	0.05	0.28
2B627	Zone 1	18666	20350	189	8	110	-133	0.85	0.11	0.59
2B62A	Zone 1	20350	20004	700	24	130	-535	0.38	0.02	0.03
2B64A	Zone 1	20344	20004	154	6	100	0	0	0	0
2B6A2	Zone 1	19990	20014	861	24	130	-846	0.6	0.05	0.06
2B6A5	Zone 1	20014	20028	499	24	130	-1,079	0.77	0.05	0.1
2B6CA	Zone 1	20326	20014	70	8	110	-203	1.3	0.09	1.3
2B7B6	Zone 1	20260	20290	549	6	100	-106	1.21	1.04	1.9
2B7CE	Zone 1	20274	20290	547	6	100	-86	0.98	0.7	1.29
2B7D4	Zone 1	20290	20326	117	8	110	-196	1.25	0.14	1.21
2B7E9	Zone 1	20264	20286	439	6	100	50	0.57	0.21	0.47
2B7EC	Zone 1	20286	20256	611	6	100	0	0	0	0
2BB61	Zone 1	20264	20274	440	6	100	-3	0.03	0	0
2BBA9	Zone 1	20286	20260	881	6	100	27	0.3	0.13	0.15
2BBBB	Zone 1	20274	20256	269	6	100	66	0.74	0.21	0.77
2BBF9	Zone 1	20256	20260	269	6	100	51	0.57	0.13	0.48
2BC66	Zone 1	70	20038	170	6	100	23	0.26	0.02	0.11
2BC6C	Zone 1	20038	20264	269	6	100	61	0.69	0.18	0.68
2BC6F	Zone 1	70	20060	1,169	6	100	-44	0.5	0.43	0.37
2BC7E	Zone 1	20060	18828	680	6	100	-18	0.21	0.05	0.07
2BC8B	Zone 1	20030	19990	186	8	110	-166	1.06	0.17	0.9
2BC91	Zone 1	20038	20030	891	6	100	-57	0.65	0.53	0.6
2BC97	Zone 1	20060	20222	353	8	110	-25	0.16	0.01	0.03
2BC9D	Zone 1	20050	20222	307	8	110	46	0.29	0.03	0.08
2BCA0	Zone 1	20222	20050	562	6	100	-14	0.16	0.03	0.04
2BCAC	Zone 1	20030	20050	258	8	110	73	0.46	0.05	0.19
2C1AC	Zone 1	18594	20034	270	8	110	-15	0.1	0	0.01
2C1B2	Zone 1	20034	20118	611	8	110	-17	0.11	0.01	0.01

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
2C1O4	Zone 1	20086	20176	626	6	100	-14	0.16	0.03	0.04
2C1CE	Zone 1	20176	18818	233	6	100	-10	0.11	0.01	0.02
2C1D7	Zone 1	18818	20086	426	6	100	19	0.21	0.03	0.07
2C1EF	Zone 1	20104	20118	360	6	100	-12	0.14	0.01	0.03
2C210	Zone 1	20090	20104	1,282	6	100	15	0.17	0.07	0.05
2C21D	Zone 1	20014	20076	171	8	110	25	0.16	0	0.03
2C220	Zone 1	20156	20076	459	8	110	-20	0.13	0.01	0.02
2C223	Zone 1	20076	20158	422	8	110	6	0.04	0	0
2C5DE	Zone 1	20006	18818	172	6	100	36	0.4	0.04	0.25
2C91E	Zone 1	20090	20118	449	8	110	56	0.36	0.05	0.12
2C924	Zone 1	20104	20034	1,006	6	100	-4	0.04	0	0
2C930	Zone 1	20176	20090	270	6	100	-13	0.14	0.01	0.04
2C937	Zone 1	20086	20034	270	6	100	21	0.24	0.03	0.09
2C95A	Zone 1	20052	20030	234	6	100	-25	0.28	0.03	0.13
2C9A6	Zone 1	20004	20006	192	24	130	-538	0.38	0.01	0.03
2C9BB	Zone 1	19990	20006	539	24	130	578	0.41	0.02	0.03
301	Gila River Zone	22828	22830	849	12	120	73	0.21	0.02	0.02
303	Gila River Zone	22830	22824	2,392	24	120	-251	0.18	0.02	0.01
305	Gila River Zone	22688	22820	1,511	16	125	808	1.29	0.68	0.45
307	Gila River Zone	22820	22828	3,294	12	120	306	0.87	1.08	0.33
311	Gila River Zone	22822	J3160	818	12	120	441	1.25	0.53	0.65
313	Gila River Zone	22822	22696	1,655	12	120	-106	0.3	0.08	0.05
315	Gila River Zone	22818	22834	2,599	24	125	-333	0.24	0.03	0.01
317	Gila River Zone	22834	22820	2,599	24	130	-11	0.01	0	0
319	Gila River Zone	22834	J10	1,433	12	120	-322	0.91	0.52	0.36
321	Gila River Zone	22824	22832	1,628	12	120	-206	0.59	0.26	0.16
323	Zone 1	22836	J3208	982	16	140	83	0.13	0.01	0.01
32324	Zone 1	18796	J3202	840	24	130	110	0.08	0	0
327	Zone 1	22836	22838	1,602	12	120	268	0.76	0.41	0.26
329	Zone 1	22838	J3186	976	12	120	51	0.15	0.01	0.01
331	Zone 1	22664	22842	2,517	12	120	-252	0.72	0.58	0.23

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
335	Zone 1	22816	22652	366	12	120	-430	1.22	0.23	0.62
353	Gila River Zone	22824	J3224	2,827	24	125	-154	0.11	0.01	0
35ACD	Zone 1	9738	18666	261	8	110	-72	0.46	0.05	0.19
35B3D	Zone 1	20060	9744	269	8	110	-28	0.18	0.01	0.03
35E89	Zone 1	18666	9744	954	6	100	21	0.24	0.09	0.09
35F26	Zone 1	9738	9732	567	6	100	13	0.15	0.02	0.04
35FF8	Zone 1	18610	18632	466	8	110	38	0.25	0.03	0.06
36080	Zone 1	18630	18632	532	6	100	-6	0.06	0	0.01
36095	Zone 1	18630	18594	337	8	110	-2	0.01	0	0
36098	Zone 1	18632	18630	301	8	110	18	0.12	0	0.01
361FD	Zone 1	9718	9710	662	6	100	-6	0.06	0.01	0.01
362E0	Zone 1	18594	9718	270	6	100	-2	0.02	0	0
36497	Zone 1	18610	10716	931	6	100	14	0.16	0.04	0.05
364F9	Zone 1	10716	9690	270	6	100	1	0.01	0	0
366FB	Zone 1	9702	18530	310	6	100	9	0.1	0.01	0.02
36879	Zone 1	11034	10720	269	6	100	8	0.1	0	0.02
368E7	Zone 1	11034	18542	691	6	100	-30	0.34	0.13	0.18
36919	Zone 1	18542	9702	600	6	100	32	0.37	0.13	0.21
36956	Zone 1	11034	18536	749	6	100	8	0.09	0.01	0.01
36959	Zone 1	18536	18530	439	6	100	-6	0.07	0	0.01
36990	Zone 1	10720	18536	480	6	100	7	0.08	0.01	0.01
36AD9	Zone 1	9726	18530	269	6	100	7	0.08	0	0.01
36AFA	Zone 1	6748	9690	786	6	100	16	0.18	0.04	0.06
36BCF	Zone 1	9690	18488	587	6	100	-1	0.01	0	0
391E08	Zone 1	70	66	178	6	100	8	0.09	0	0.01
411	Zone 1	22876	23518	2,595	12	120	97	0.28	0.1	0.04
413	Zone 1	22876	24070	5,276	12	120	-97	0.28	0.21	0.04
593	Zone 1	20052	18828	57	6	100	21	0.24	0.01	0.09
69	Zone 1	20028	23524	1,486	12	120	171	0.48	0.17	0.11
71	Zone 1	22648	J3166	288	24	130	317	0.23	0	0.01
73	Zone 1	22652	22650	2,698	12	120	348	0.99	1.12	0.42

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
75	Zone 1	22652	J3164	2,218	12	120	-963	2.73	6.08	2.74
77	Zone 1	22652	22656	2,296	12	120	-108	0.31	0.11	0.05
79	Zone 1	22656	22658	394	12	120	-148	0.42	0.03	0.09
83	Zone 1	22660	22662	987	12	120	31	0.09	0	0
85	Zone 1	22654	22662	1,480	12	120	44	0.13	0.01	0.01
87	Zone 1	22654	22664	1,100	12	120	-120	0.34	0.06	0.06
89	Zone 1	22664	22666	2,616	12	120	-46	0.13	0.03	0.01
8B1A3	Zone 1	9710	18610	270	6	100	-21	0.24	0.03	0.1
8B1B5	Zone 1	9726	18666	903	6	100	-24	0.27	0.11	0.12
8B397	Zone 1	10720	9702	269	6	100	-8	0.1	0	0.02
8B39A	Zone 1	10716	18594	1,422	6	100	-5	0.06	0.01	0.01
8CA72	Zone 1	20020	20028	1,309	24	130	1,252	0.89	0.17	0.13
8CB0B	Zone 1	9744	9726	1,339	6	100	8	0.09	0.02	0.02
8CB0E	Zone 1	9744	9732	348	8	110	-36	0.23	0.02	0.05
8CB14	Zone 1	9732	9738	281	8	110	-44	0.28	0.02	0.08
8CB29	Zone 1	9710	9718	656	6	100	6	0.06	0.01	0.01
8CB54	Zone 1	6748	18488	1,299	6	100	12	0.14	0.04	0.03
91	Zone 1	22666	22668	2,538	12	120	-364	1.03	1.15	0.45
93	Zone 1	22668	22670	1,341	12	125	-618	1.75	1.5	1.12
95	Zone 1	22666	22674	2,634	12	120	89	0.25	0.09	0.03
97	Zone 1	22674	23520	2,678	12	120	-235	0.67	0.54	0.2
99	Zone 1	22672	22676	2,628	16	140	1,273	2.03	2.24	0.85
P101	Gila River Zone	J88	J80	325	8	100	-18	0.12	0.01	0.02
P103	Gila River Zone	J90	J94	298	8	100	18	0.12	0.01	0.02
P105	Gila River Zone	J88	J90	954	8	100	10	0.07	0.01	0.01
P107	Gila River Zone	J92	J72	292	8	100	-23	0.15	0.01	0.03
P109	Gila River Zone	J94	J70	273	8	100	18	0.11	0	0.02
P11	Gila River Zone	J10	22688	2,594	12	120	-127	0.36	0.17	0.06
P111	Gila River Zone	J92	J94	973	8	100	-1	0	0	0
P113	Gila River Zone	J96	J690	1,028	8	100	-40	0.26	0.08	0.08
P115	Gila River Zone	J96	J98	295	8	100	-32	0.21	0.02	0.05

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P117	Gila River Zone	J100	J98	803	8	100	32	0.21	0.04	0.05
P119	Gila River Zone	J102	J100	2,012	8	100	9	0.06	0.01	0
P121	Gila River Zone	J100	J102	326	8	100	-23	0.15	0.01	0.03
P123	Gila River Zone	J104	J692	1,241	8	100	13	0.09	0.01	0.01
P125	Gila River Zone	J104	J106	295	8	100	-13	0.09	0	0.01
P127	Gila River Zone	J108	J112	296	8	100	13	0.09	0	0.01
P129	Gila River Zone	J110	J116	751	8	100	-18	0.11	0.01	0.02
P13	Gila River Zone	J12	J3220	692	8	120	147	0.94	0.42	0.61
P131	Gila River Zone	J108	J110	247	8	100	7	0.05	0	0
P133	Gila River Zone	J112	J106	299	8	100	13	0.09	0	0.01
P135	Gila River Zone	J112	J114	352	8	100	0	0	0	0
P137	Gila River Zone	J116	J108	542	8	100	21	0.13	0.01	0.02
P139	Gila River Zone	J116	J120	222	8	100	-39	0.25	0.02	0.07
P141	Gila River Zone	J118	J22678	1,447	12	120	-443	1.26	0.94	0.65
P143	Gila River Zone	J120	J96	354	8	100	-72	0.46	0.08	0.23
P145	Gila River Zone	J118	J120	179	8	100	-34	0.21	0.01	0.06
P15	Gila River Zone	J14	J28	717	6	100	0	0	0	0
P1673	Gila River Zone	J3160	J2832	1,828	12	120	361	1.02	0.81	0.45
P1675	Gila River Zone	J2820	J3160	3,184	12	120	21	0.06	0.01	0
P1677	Gila River Zone	J2832	J3224	2,698	12	120	154	0.44	0.25	0.09
P1679	Gila River Zone	J10	J22680	3,887	12	120	-472	1.34	2.84	0.73
P1681	Zone 1	J2842	J3182	2,240	12	120	286	0.81	0.65	0.29
P1683	Zone 1	J3164	J22698	424	24	120	-1,006	0.71	0.04	0.1
P1685	Zone 1	J3166	J22650	839	24	130	-163	0.12	0	0
P1687	Zone 1	J3166	J3170	990	12	120	357	1.01	0.43	0.44
P1689	Zone 1	J3168	J3184	1,530	12	120	-5	0.01	0	0
P1691	Zone 1	J3170	J3168	1,670	12	120	232	0.66	0.33	0.2
P1693	Gila River Zone	J3172	J22690	666	12	120	-130	0.37	0.04	0.07
P1695	Gila River Zone	J3174	J22688	1,070	16	125	1,205	1.92	1.01	0.95
P1697	Gila River Zone	J3172	J3174	1,059	12	100	-332	0.94	0.57	0.54
P1699	Gila River Zone	J3176	J22826	2,161	12	120	254	0.72	0.5	0.23

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P17	Gila River Zone	J18	J16	882	6	100	0	0	0	0
P1701	Gila River Zone	J3180	J118	1,247	12	120	-477	1.35	0.93	0.75
P1703	Zone 1	J3182	22658	174	12	120	180	0.51	0.02	0.12
P1705	Zone 1	22660	J3182	435	12	120	-31	0.09	0	0
P1707	Zone 1	J3184	23518	1,989	12	120	-178	0.51	0.24	0.12
P1711	Gila River Zone	J3176	22818	341	12	120	-578	1.64	0.36	1.06
P1715	Zone 1	22698	J430	3,296	12	120	667	1.89	4.58	1.39
P1727	Zone 1	J3202	J3222	785	24	130	0	0	0	0
P1729	Zone 1	J3186	J3202	1,983	12	120	-56	0.16	0.03	0.01
P1731	Zone 1	J3204	V8000	242	12	120	0	0	0	0
P1733	Zone 1	J3208	V8002	216	16	140	0	0	0	0
P1737	Zone 1	J3206	23520	2,281	8	120	83	0.53	0.48	0.21
P1739	Zone 1	J3206	J3208	2,639	8	120	-83	0.53	0.55	0.21
P1741	Gila River Zone	J3172	22822	1,567	12	120	335	0.95	0.61	0.39
P1745	Gila River Zone	J3212	J3210	2,444	8	120	0	0	0	0
P1747	Gila River Zone	19302	J3210	1,563	8	120	0	0	0	0
P1749	Zone 1	RES9006	22698	551	24	120	5,753	4.08	1.41	2.57
P1751	Gila River Zone	RES9008	22682	8,488	24	120	4,651	3.3	14.69	1.73
P1753	Zone 1	V8000	22678	115	12	120	0	0	0	0
P1755	Zone 1	V8002	22682	223	16	140	0	0	0	0
P1757	Zone 1	V8004	10982	88	24	130	0	0	0	0
P1759	Zone 1	J3214	J3204	1,149	12	120	0	0	0	0
P1761	Gila River Zone	J3216	J14	294	6	100	0	0	0	0
P1763	Gila River Zone	J3218	J20	248	6	100	0	0	0	0
P1765	Gila River Zone	J3220	22686	382	8	120	147	0.94	0.23	0.61
P1769	Zone 1	J3222	V8004	48	24	130	0	0	0	0
P1773	Gila River Zone	V8006	J3212	132	8	120	0	0	0	0
P1777	Gila River Zone	J3226	10982	112	16	120	194	0.31	0	0.03
P1779	Gila River Zone	J3228	22694	407	12	120	447	1.27	0.27	0.66
P1781	Gila River Zone	J3226	J3228	1,466	12	120	678	1.92	2.1	1.43
P19	Gila River Zone	J18	J3218	580	6	100	0	0	0	0

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P21	Gila River Zone	J20	J26	297	6	100	0	0	0	0
P23	Gila River Zone	J22	22686	945	12	120	-100	0.28	0.04	0.04
P25	Gila River Zone	J24	J3216	332	6	100	0	0	0	0
P27	Gila River Zone	J22	J24	182	6	100	0	0	0	0
P29	Gila River Zone	J26	J24	327	6	100	0	0	0	0
P31	Gila River Zone	J28	J16	297	6	100	0	0	0	0
P33	Gila River Zone	J28	J32	930	6	100	0	0	0	0
P35	Gila River Zone	J32	J26	443	6	100	0	0	0	0
P37	Gila River Zone	J32	J3216	877	6	100	0	0	0	0
P39	Gila River Zone	J34	22680	1,317	16	120	-709	1.13	0.5	0.38
P41	Gila River Zone	J34	J78	821	8	100	180	1.15	1.02	1.25
P43	Gila River Zone	J38	J84	331	6	100	-21	0.24	0.03	0.09
P45	Gila River Zone	J36	J44	285	6	100	20	0.23	0.03	0.09
P47	Gila River Zone	J38	J46	285	6	100	21	0.24	0.03	0.09
P49	Gila River Zone	J40	J48	626	6	100	-13	0.15	0.02	0.04
P501	Zone 1	J418	23526	675	12	120	204	0.58	0.1	0.15
P503	Zone 1	J418	J420	204	8	120	-33	0.21	0.01	0.04
P505	Zone 1	J420	J422	1,044	8	120	-29	0.19	0.03	0.03
P507	Zone 1	J422	J424	310	8	120	17	0.11	0	0.01
P509	Zone 1	J424	J420	1,080	6	120	13	0.14	0.03	0.03
P51	Gila River Zone	J44	J60	256	6	100	29	0.32	0.04	0.17
P511	Zone 1	J422	J426	272	8	120	-55	0.35	0.03	0.1
P513	Zone 1	J426	J428	280	8	120	-90	0.58	0.07	0.25
P515	Zone 1	J428	J430	174	8	120	-148	0.95	0.11	0.62
P517	Zone 1	J432	J440	422	12	120	231	0.66	0.08	0.2
P519	Zone 1	J432	J434	184	12	100	-93	0.26	0.01	0.05
P521	Zone 1	J434	J428	665	6	120	-58	0.66	0.29	0.44
P523	Zone 1	J436	J434	240	12	100	0	0	0	0
P525	Zone 1	J434	J438	356	6	120	-35	0.4	0.06	0.18
P527	Zone 1	J438	J426	930	6	120	-35	0.4	0.16	0.17
P529	Zone 1	J440	J458	291	12	120	592	1.68	0.32	1.11

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P53	Gila River Zone	J46	J50	290	6	100	12	0.13	0.01	0.03
P531	Zone 1	J430	J440	584	12	120	510	1.45	0.49	0.84
P533	Zone 1	J442	J490	185	12	120	470	1.33	0.13	0.73
P535	Zone 1	J444	J460	531	12	120	534	1.51	0.49	0.92
P537	Zone 1	J444	J448	216	8	120	-162	1.03	0.16	0.73
P539	Zone 1	J448	J450	302	8	120	-164	1.05	0.22	0.74
P541	Zone 1	J450	J452	339	8	120	-128	0.82	0.16	0.47
P543	Zone 1	J452	J446	347	8	120	-88	0.56	0.08	0.24
P545	Zone 1	J446	J454	614	8	120	-88	0.56	0.15	0.24
P547	Zone 1	J454	J452	681	6	120	50	0.57	0.23	0.33
P549	Zone 1	J454	J440	191	8	120	-145	0.93	0.11	0.6
P55	Gila River Zone	J44	J52	279	6	100	-8	0.09	0	0.02
P551	Zone 1	J442	J450	596	8	120	43	0.27	0.04	0.06
P553	Zone 1	J456	J502	98	12	120	479	1.36	0.07	0.75
P555	Zone 1	J456	J448	312	8	120	6	0.04	0	0
P557	Zone 1	J458	J442	163	12	120	517	1.47	0.14	0.37
P559	Zone 1	J460	J462	346	12	120	515	1.46	0.3	0.86
P561	Zone 1	J462	J464	303	12	120	479	1.36	0.23	0.75
P563	Zone 1	J464	J2648	251	12	120	588	1.67	0.28	1.1
P565	Zone 1	J464	J468	431	8	120	-109	0.7	0.15	0.35
P567	Zone 1	J468	J470	606	6	120	-30	0.34	0.08	0.13
P569	Zone 1	J470	J472	277	6	120	-30	0.34	0.04	0.13
P57	Gila River Zone	J48	J42	279	6	100	-6	0.07	0	0.01
P571	Zone 1	J472	J474	289	6	120	-30	0.34	0.04	0.13
P573	Zone 1	J474	J476	317	6	120	47	0.54	0.1	0.3
P577	Zone 1	J476	J462	413	8	120	-36	0.23	0.02	0.04
P579	Zone 1	J460	J480	637	8	120	17	0.11	0.01	0.01
P581	Zone 1	J480	J482	260	8	120	-70	0.45	0.04	0.16
P583	Zone 1	J482	J484	261	8	120	-77	0.49	0.05	0.18
P585	Zone 1	J484	J486	538	8	120	-89	0.57	0.13	0.24
P589	Zone 1	J486	J488	249	8	120	1	0.01	0	0

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P59	Gila River Zone	J50	J42	507	6	100	6	0.07	0	0.01
P591	Zone 1	J490	J456	160	12	120	492	1.4	0.13	0.79
P593	Zone 1	J490	J492	685	6	120	-31	0.35	0.1	0.14
P595	Zone 1	J492	J494	340	6	120	-45	0.51	0.09	0.28
P597	Zone 1	J494	J496	329	8	120	-29	0.19	0.01	0.03
P599	Zone 1	J496	J498	950	8	120	-39	0.25	0.05	0.05
P601	Zone 1	J498	J458	166	8	120	-71	0.45	0.03	0.16
P605	Zone 1	J494	J498	713	6	120	-24	0.27	0.06	0.08
P607	Zone 1	J502	J444	178	12	120	372	1.05	0.08	0.47
P609	Zone 1	J486	J502	1,150	8	120	-103	0.66	0.36	0.31
P61	Gila River Zone	J48	J54	302	6	100	-7	0.08	0	0.01
P611	Zone 1	J480	J474	278	6	120	78	0.88	0.21	0.76
P613	Zone 1	J476	J468	306	8	120	79	0.5	0.06	0.19
P63	Gila River Zone	J52	J46	615	6	100	-9	0.11	0.01	0.02
P65	Gila River Zone	J54	J50	462	6	100	-6	0.06	0	0.01
P67	Gila River Zone	J52	J54	749	6	100	1	0.01	0	0
P71	Gila River Zone	J60	J40	524	6	100	-13	0.15	0.02	0.04
P75	Gila River Zone	J64	J12	457	8	100	147	0.94	0.39	0.85
P77	Gila River Zone	J64	J60	194	6	100	-41	0.47	0.06	0.33
P79	Gila River Zone	J66	J68	876	8	100	8	0.05	0	0
P81	Gila River Zone	J68	J90	289	8	100	8	0.05	0	0
P83	Gila River Zone	J70	J82	335	8	100	18	0.11	0.01	0.02
P831	Gila River Zone	J690	J102	258	8	100	32	0.21	0.01	0.05
P833	Gila River Zone	J690	J78	197	8	110	-72	0.46	0.04	0.19
P835	Gila River Zone	J692	J110	638	8	100	-25	0.16	0.02	0.03
P837	Gila River Zone	J692	J64	203	8	100	39	0.25	0.01	0.07
P87	Gila River Zone	J66	J88	265	8	100	-8	0.05	0	0
P89	Gila River Zone	J78	J64	1,325	8	100	67	0.43	0.26	0.2
P91	Gila River Zone	J80	J72	337	8	100	23	0.15	0.01	0.03
P93	Gila River Zone	J78	J80	199	8	100	41	0.26	0.02	0.08
P95	Gila River Zone	J82	J92	370	8	100	-23	0.15	0.01	0.03

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ID (Char)	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P97	Gila River Zone	J84	J36	552	6	100	20	0.23	0.05	0.09
P99	Gila River Zone	J82	J84	447	8	100	41	0.26	0.04	0.08

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
10716		Zone 1	19	955	1159	88
10720		Zone 1	10	958	1159	87
10982	45	Gila River Zone	194	944	1082	60
11034		Zone 1	14	956	1159	88
18488		Zone 1	27	951	1159	90
18530		Zone 1	10	961	1159	86
18536		Zone 1	21	961	1159	86
18542		Zone 1	51	956	1159	88
18594		Zone 1	10	959	1159	87
18610		Zone 1	14	959	1159	87
18630		Zone 1	25	965	1159	84
18632		Zone 1	15	957	1159	87
18666		Zone 1	15	961	1159	86
18796		Zone 1	7	955	1159	88
18818		Zone 1	7	955	1159	88
18828		Zone 1	3	975	1159	80
19302	44	Gila River Zone	217	935	1079	62
19990		Zone 1	6	966	1159	84
20004		Zone 1	3	955	1159	88
20006		Zone 1	4	964	1159	85
20014		Zone 1	5	969	1159	82
20020		Zone 1	4	975	1159	80
20028	46	Zone 1	2	971	1159	82
20030		Zone 1	12	967	1159	83
20034		Zone 1	19	960	1159	86
20038		Zone 1	19	971	1158	81
20050		Zone 1	13	968	1159	83
20052		Zone 1	4	966	1159	84
20060		Zone 1	28	967	1159	83
20076		Zone 1	0	968	1159	83
20086		Zone 1	11	961	1159	86

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
20090		Zone 1	12	965	1159	84
20104		Zone 1	31	963	1159	85
20118		Zone 1	27	964	1159	85
20156		Zone 1	20	966	1159	83
20158		Zone 1	6	969	1159	82
20176		Zone 1	9	964	1159	84
20222		Zone 1	34	968	1159	83
20256		Zone 1	15	971	1158	81
20260		Zone 1	183	972	1158	80
20264		Zone 1	13	969	1158	82
20274		Zone 1	18	970	1158	82
20286		Zone 1	24	973	1158	80
20290		Zone 1	3	970	1159	82
20326		Zone 1	7	969	1159	82
20344		Zone 1	0	963	1159	85
20350		Zone 1	6	960	1159	86
22648	48	Zone 1	173	1005	1156	66
22650	20	Zone 1	185	998	1156	69
22652	15	Zone 1	292	1000	1157	68
22654	9	Zone 1	75	1003	1158	67
22656	14	Zone 1	40	1003	1158	67
22658	13	Zone 1	32	1004	1158	67
22660	11	Zone 1	0	1003	1158	67
22662	10	Zone 1	75	1003	1158	67
22664	8	Zone 1	179	996	1158	70
22666	7	Zone 1	228	980	1158	77
22668	24	Zone 1	254	974	1159	80
22670		Zone 1	0	965	1160	85
22672	25	Zone 1	64	985	1162	77
22674	6	Zone 1	257	963	1158	84
22676	26	Zone 1	121	958	1160	88

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
22678	5	Gila River Zone	85	945	1081	59
22680	27	Gila River Zone	250	944	1082	60
22682	31	Gila River Zone	202	940	1085	63
22684		Gila River Zone	0	927	1079	66
22686		Gila River Zone	0	925	1079	67
22688	38	Gila River Zone	269	915	1079	71
22690		Gila River Zone	0	926	1080	66
22692	35	Gila River Zone	101	944	1080	59
22694	36	Gila River Zone	43	935	1080	63
22696	40	Gila River Zone	81	928	1079	66
22698	22	Zone 1	64	989	1164	76
22810	50	Zone 1	0	967	1159	83
22816		Zone 1	0	1005	1157	66
22818	3	Gila River Zone	82	910	1078	73
22820	41	Gila River Zone	471	905	1078	75
22822		Gila River Zone	0	930	1079	65
22824	53	Gila River Zone	110	895	1077	79
22826	1	Gila River Zone	163	896	1078	79
22828	51	Gila River Zone	324	905	1077	75
22830	52	Gila River Zone	324	905	1077	75
22832	42	Gila River Zone	0	905	1078	75
22834		Gila River Zone	0	912	1078	72
22836	28	Zone 1	394	955	1159	88
22838	29	Zone 1	217	965	1159	84
22842	23	Zone 1	267	995	1158	71
22876		Zone 1	0	1025	1156	57
23518	16	Zone 1	350	1015	1156	61
23520	26.1	Zone 1	254	959	1158	86
23522		Zone 1	0	983	1163	78
23524		Zone 1	0	975	1159	80
23526		Zone 1	0	980	1159	77

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
23998	32	Gila River Zone	372	952	1083	57
24070		Zone 1	0	1019	1156	59
24072		Zone 1	0	1014	1156	62
3290	49	Zone 1	0	992	1156	71
66		Zone 1	8	972	1158	81
6748		Zone 1	33	954	1159	89
70		Zone 1	13	971	1158	81
9690		Zone 1	18	954	1159	89
9702		Zone 1	15	959	1159	86
9710		Zone 1	10	960	1159	86
9718		Zone 1	9	960	1159	86
9726		Zone 1	25	962	1159	85
9732		Zone 1	21	964	1159	84
9738		Zone 1	15	962	1159	85
9744		Zone 1	22	966	1159	84
J10	37	Gila River Zone	324	918	1079	70
J100		Gila River Zone	0	939	1080	61
J102		Gila River Zone	0	938	1080	62
J104		Gila River Zone	0	926	1080	67
J106		Gila River Zone	0	928	1080	66
J108		Gila River Zone	0	930	1080	65
J110		Gila River Zone	0	930	1080	65
J112		Gila River Zone	0	928	1080	66
J114		Gila River Zone	0	928	1080	66
J116		Gila River Zone	0	931	1080	65
J118		Gila River Zone	0	934	1080	63
J12		Gila River Zone	0	926	1080	67
J120		Gila River Zone	0	934	1080	63
J14		Gila River Zone	0	919	1079	69
J16		Gila River Zone	0	924	1079	67
J18		Gila River Zone	0	924	1079	67

Peak Hour Demand
Junction Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J20		Gila River Zone	0	920	1079	69
J22		Gila River Zone	0	917	1079	70
J24		Gila River Zone	0	918	1079	70
J26		Gila River Zone	0	919	1079	69
J28		Gila River Zone	0	922	1079	68
J3160	39	Gila River Zone	101	913	1078	72
J3164	21	Zone 1	43	988	1164	76
J3166	19	Zone 1	124	994	1156	70
J3168	18	Zone 1	237	1010	1156	63
J3170	18.1	Zone 1	124	999	1156	68
J3172	34	Gila River Zone	127	927	1080	66
J3174	33	Gila River Zone	237	920	1080	69
J3176	2	Gila River Zone	324	906	1078	75
J3180	4	Gila River Zone	251	925	1079	67
J3182	12	Zone 1	75	1000	1158	68
J3184	17	Zone 1	173	1012	1156	62
J3186	30	Zone 1	107	952	1159	90
J32		Gila River Zone	0	921	1079	68
J3202	45.1	Zone 1	54	950	1159	90
J3204		Zone 1	0	944	1158	93
J3206		Zone 1	0	943	1159	93
J3208		Zone 1	0	940	1159	95
J3210		Gila River Zone	0	924	1079	67
J3212		Gila River Zone	0	938	1079	61
J3214	5.1	Zone 1	67	954	1158	88
J3216		Gila River Zone	0	917	1079	70
J3218		Gila River Zone	0	921	1079	68
J3220		Gila River Zone	0	922	1079	68
J3222		Zone 1	0	944	1159	93
J3224	43	Gila River Zone	0	910	1077	73
J3226		Gila River Zone	0	944	1082	60

Peak Hour Demand
Junction Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J3228		Gila River Zone	0	934	1080	63
J34		Gila River Zone	0	942	1081	60
J36		Gila River Zone	0	932	1080	64
J38		Gila River Zone	0	932	1080	64
J40		Gila River Zone	0	925	1080	67
J418		Zone 1	0	975	1159	80
J42		Gila River Zone	0	926	1080	67
J420		Zone 1	8	975	1159	80
J422		Zone 1	9	980	1159	77
J424		Zone 1	4	979	1159	78
J426		Zone 1	0	981	1159	77
J428		Zone 1	0	982	1159	77
J430		Zone 1	9	983	1159	76
J432		Zone 1	66	980	1159	77
J434		Zone 1	0	980	1159	77
J436		Zone 1	0	981	1159	77
J438		Zone 1	0	977	1159	79
J44		Gila River Zone	0	930	1080	65
J440	47	Zone 1	3	983	1159	76
J442		Zone 1	4	985	1158	75
J444		Zone 1	0	989	1158	73
J446		Zone 1	0	984	1158	76
J448		Zone 1	8	988	1158	74
J450		Zone 1	7	987	1158	74
J452		Zone 1	10	985	1158	75
J454		Zone 1	7	983	1158	76
J456		Zone 1	8	987	1158	74
J458		Zone 1	5	984	1158	75
J46		Gila River Zone	0	930	1080	65
J460		Zone 1	2	990	1157	72
J462		Zone 1	0	992	1157	71

Peak Hour Demand
Junction Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J464		Zone 1	0	993	1157	71
J468		Zone 1	0	994	1157	71
J470		Zone 1	0	995	1157	70
J472		Zone 1	0	994	1157	71
J474		Zone 1	0	993	1157	71
J476		Zone 1	4	993	1157	71
J48		Gila River Zone	0	926	1080	67
J480		Zone 1	10	992	1157	72
J482		Zone 1	7	993	1157	71
J484		Zone 1	12	992	1157	72
J486		Zone 1	13	990	1157	73
J488		Zone 1	1	990	1157	73
J490		Zone 1	9	986	1158	74
J492		Zone 1	14	989	1158	73
J494		Zone 1	8	987	1158	74
J496		Zone 1	10	986	1158	75
J498		Zone 1	8	984	1158	75
J50		Gila River Zone	0	929	1080	66
J502		Zone 1	4	988	1158	74
J52		Gila River Zone	0	930	1080	65
J54		Gila River Zone	0	928	1080	66
J60		Gila River Zone	0	929	1080	65
J64		Gila River Zone	0	929	1080	65
J66		Gila River Zone	0	940	1080	61
J68		Gila River Zone	0	939	1080	61
J690		Gila River Zone	0	937	1080	62
J692		Gila River Zone	0	929	1080	65
J70		Gila River Zone	0	934	1080	63
J72		Gila River Zone	0	934	1080	63
J78		Gila River Zone	0	937	1080	62
J80		Gila River Zone	0	936	1080	63

Peak Hour Demand
Junction Data - Alternative No. 3
West Goodyear Central Planning Area
Goodyear, Arizona

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J82		Gila River Zone	0	934	1080	63
J84		Gila River Zone	0	932	1080	64
J88		Gila River Zone	0	936	1080	63
J90		Gila River Zone	0	938	1080	62
J92		Gila River Zone	0	934	1080	63
J94		Gila River Zone	0	935	1080	63
J96		Gila River Zone	0	935	1080	63
J98		Gila River Zone	0	937	1080	62

APPENDIX D

TATA & HOWARD
AUGUST 2012 REPORT



August 30, 2012

Mr. Eric Laurin, P.E.
Associate/Director
Coe & Van Loo Consultants, Inc.
4550 N. 12th Street
Phoenix, AZ 85014

Subject: Water Modeling for West Goodyear Developments Hydraulic Analysis
Goodyear, Arizona

Dear Mr. Laurin:

As requested, Tata & Howard, Inc. has performed a review of West Goodyear Central Planning Area water system. The West Goodyear Central Planning Area is a proposed mixed use development west of Cotton Lane. The existing computer hydraulic model was updated to include the proposed development and demands as provided by Coe & Van Loo Consultants (CVL). The velocities, pressures, headlosses, and flow rates were evaluated in the proposed development under average day (ADD), maximum day (MDD), and peak hour (PH) demands. The available fire flow was also considered under maximum day demand conditions while maintaining a minimum pressure of 20 pounds per square inch (psi) within the water distribution system. The results of the analysis are presented herein.

Evaluation Criteria

Based on the City of Goodyear's 2008 Integrated Water Master Plan (IWMP), the City requires that a minimum pressure of 40 psi be maintained at ground level during ADD, MDD, and PH conditions. A maximum pressure of 80 psi should be maintained at ground level during ADD, MDD and PH conditions. The City does allow pressures above 80 psi in localized areas of lower elevations. Residential homes in areas with pressures above 80 psi will be required to have individual pressure reducing valves (PRV) installed at the time of development to maintain pressures less than 80 psi.

The City's 2008 Integrated Water Master Plan (IWMP) design criteria for distribution piping states that the velocity in the water main shall not exceed 10 feet per second (ft/s) under PH conditions. As the velocity in a pipe increases, the risk of potential problems such as water hammer increases. The headloss in water mains are required to have an

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upper limit of between 2 and 3 feet per 1,000 feet (ft/1,000 ft) during PH conditions. Excessive headloss in water main results in wasted energy in the system due to increased pumping and power costs.

Based on information provided by CVL, the required fire flow while maintaining 20 psi throughout the planning area is 1,500 gpm for residential areas and 3,000 gpm for non-residential areas. The model nodes in the study area were designated as residential or non-residential based on Figure 3 Water Study Area – Land Use provided by CVL.

Study Area

Based on recommendations from CVL, the study area for this evaluation includes all existing and proposed water mains west of Cotton Lane. The hydraulic model was updated to include the proposed water mains shown in Figure 7 Water Model System Layout, provided by CVL. The water main configuration primarily includes water mains located on the main arterial roads ranging from 12-inch diameter to 24-inch diameter. Some smaller diameter water mains are shown to simulate looping through proposed properties. Information on additional water mains throughout the individual land use areas was not provided to Tata & Howard. The water main C-values in the existing model were assigned when the model was originally created, by others, and updated through the Water Model Calibration Technical Memorandum completed by Tata & Howard, Inc. in June 2008. For consistency, the C-values of the existing water mains were not adjusted as part of this model update. The proposed water mains were assigned a C-value based on material and diameter. Larger water mains were assigned incrementally higher C-values than smaller diameter water mains. Typically C-values of 100 to 140 are used when evaluating relatively new cement lined ductile iron water mains. The proposed configuration and study area boundary is shown in Figure No. 1.

The IWMP recommends separating the existing service zone north of the Gila River into two pressure zones: Zone 1 and the Gila River Zone. Zone 1 will have a hydraulic grade line (HGL) elevation of approximately 1,165 feet above mean sea level (MSL) and the Gila River Zone will have a HGL elevation of approximately 1,100 feet above MSL. Throughout the entire City, Zone 1 will primarily serve elevations ranging from 950 feet to 1,050 feet above MSL and the Gila River Zone will primarily serve elevations ranging from 890 feet to 950 feet above MSL.

The portion of the study area located in Zone 1 includes all water mains north of Lower Buckeye Road. The elevations in this area range from approximately 940 feet to 1,025 feet above MSL. The elevations lower than 950 feet are located at the service area boundary. The portion of the study area located Gila Service Zone includes all water mains on Lower Buckeye Road west of 173rd Avenue and all water mains south of Lower

Buckeye Road. Elevations in this area range from approximately 895 feet to 950 feet above MSL. The zone boundary is shown in Figure No. 1.

The proposed ADD, MDD, and PH demands for the study area were provided by CVL. The demands were added to the existing demands in the hydraulic model in the correct location based on nodes identified on Figure 5 Proposed West Goodyear Central Planning Area IDG Arterial, provided by CVL. The ADD, MDD and PH demands are approximately 4.6 million gallons per day (mgd), 7.8 mgd, and 13.3 mgd, respectively. These demands will be supplied by the proposed Silva Site located on Citrus Road at Harrison Street. It is assumed that this site will have adequate storage and supply to serve the West Goodyear Central Planning Area.

The Silva Site will be equipped with two sets of pumps, one set for each zone. The Zone 1 pumps will serve the system through a 24-inch diameter water main that connects to the system on Citrus Road. A dedicated 24-inch diameter transmission main will be installed on Citrus Road from the Silva Site to Lower Buckeye Road. Design information for the planned Silva Site was not available at the time of this study. The hydraulic model simulations were completed using two fixed reservoirs. The Zone 1 Reservoir was set at a HGL of 1,165 feet above MSL and the Gila River Zone Reservoir was set at a HGL of 1,100 feet above MSL.

CVL proposes to separate the two pressure zones with PRVs located just north of Lower Buckeye Road at Perryville Road, Citrus Road and 173rd Avenue. It is assumed that the existing water main on Lower Buckeye Road west of Cotton Lane will remain a Zone 1 transmission line in the future. A PRV will need to be installed on 169th Avenue south of Lower Buckeye Road. It is assumed that the infrastructure upgrades recommended in the IWMP to allow Site 12 to supply Zone I and the Gila River Zone will be completed by others. These improvements include a Gila River Zone transmission main on Lower Buckeye Road at this location. After that water main is installed, the 8-inch diameter water main on 169th Avenue should be disconnected from the Zone 1 transmission main, connected to the Gila River Zone transmission main and the PRV removed.

For the purpose of this hydraulic evaluation, CVL requested that the study area be evaluated as an independent system. Therefore, impacts of this development on the water system outside of the West Goodyear Central Planning Area were not considered. Also, additional growth or infrastructure improvements in other areas of the City were not included in the model simulations. In order to separate the study area, valves were closed in the model on Van Buren Street, Yuma Road, and MC 85 east of Cotton Lane as well as on Lower Buckeye Road east of 169th Avenue and on Canyon Trails Boulevard north of Lower Buckeye Road. The water main on Lower Buckeye Road west of 173rd Avenue is a Zone 1 water main. Site 12 remained offline for all simulations and the existing water mains near Site 12 were assumed to be part of the Gila River Zone.

Hydraulic Analysis

Two alternatives for creating the two pressure zones were considered for this evaluation. Alternative No. 1 includes the proposed PRVs on Perryville Road, Citrus Road and 173rd Street with the dedicated 24-inch diameter transmission on Citrus Road from the Silva Site to Lower Buckeye Road. Alternative No. 2 includes the dedicated 24-inch transmission main on Citrus Road from the Silva Site to Lower Buckeye Road and closed valves separating the pressure Zones on Perryville Road, Citrus Road and 173rd Street.

Alternative No. 1 – Proposed Water Main Configuration with PRVs

Hydraulic simulations were conducted to estimate the minimum and maximum pressures in the study area during ADD, MDD and PH demand conditions. Under ADD conditions, modeled pressures range from approximately 60 psi to 97 psi in Zone 1 and 64 psi to 89 psi in the Gila Service Area. Under MDD conditions, pressures in the study area range from 58 psi to 95 psi in Zone 1 and 64 psi to 88 psi in the Gila Service Area. Under PH conditions, modeled pressures range from approximately 53 psi to 89 psi in Zone 1 and 64 psi to 87 psi in the Gila Service Area.

Pressures in the study area do not drop below the City's minimum pressure of 40 psi during these demand conditions. Areas in Zone 1 below an elevation of approximately 980 feet above MSL could experience pressures greater than 80 psi. Ground elevations less than 980 feet are located between Yuma Road and Lower Buckeye Road. Areas in the Gila Service Area below an elevation of approximately 915 feet above MSL could experience pressures greater than 80 psi. Ground elevations less than 915 feet are located south of Broadway Road.

Under ADD and MDD, there are no proposed water mains that exceed the design criteria for velocity and headloss. The following water mains have headlosses greater than the 2008 IWMP design criteria of 3 ft/1,000 ft during PH conditions:

- 12-inch water main on Citrus Road from Harrison Street to Van Buren Street
- 12-inch diameter on Harrison Street west of Citrus Road
- 12-inch diameter water main on Harrison Street from Citrus Road to 174th Avenue
- 16-inch diameter water main on Yuma Road from Citrus Road to 175th Drive
- 24-inch water main from the Silva Site to Citrus Road

It is recommended that the proposed 12-inch water mains on Citrus Road from Harrison Street to Van Buren Street and on Harrison Street west of Citrus Road be 16-inch diameter water mains to improve transmission from the Silva Site. This would result in approximately 5,000 feet of 16-inch diameter water main. The 12-inch diameter water main on Harrison Street from Citrus Road to 174th Avenue and the 16-inch diameter water

main on Yuma road are existing water mains. The headloss in these mains is approximately 3.5 ft/1,000 ft. These water mains would have to be upgraded to reduce the headloss to less than 3 ft/1,000 ft. These improvements would result in approximately 3,300 feet of 16-inch diameter water main on Harrison Road and approximately 2,700 feet of 24-inch diameter water main on Yuma Road. It is also recommended that a 30-inch diameter water main be installed from the Silva Site to Citrus Road. The recommended water main configuration is shown in Figure No. 2.

The model nodes in the study area were designated as residential or non-residential for the evaluation of the available fire flow while maintaining 20 psi under MDD conditions based on Figure 3 Water Study Area – Land Use provided by CVL. The water mains in the residential neighborhood including 185th Avenue, Raymond Street, Vista Norte Street and 185th Drive are 6-inch diameter. This neighborhood is fed by a 6-inch diameter main on 183rd Avenue between Las Brisas Drive and Vista Norte Street. In order to provide a second feed to this neighborhood and increase the available fire flow along Raymond Street, an 8-inch diameter water main is recommended on Illini Street from 185th Avenue to 185th Drive. The recommended water main configuration is shown in Figure No. 2.

It is important to note that the available fire flow was estimated based on the configuration of the proposed water mains provided by CVL. Information was not provided on the water mains to be located within individual land use areas. These water mains should be a minimum of 8-inch diameter and should be looped to the main arterial roads in multiple locations. The estimated available flow within these land use areas cannot be determined at this time and should be evaluated when the final water main configuration is designed.

Alternative No. 2 -- Proposed Water Main Configuration without PRVs

Using closed valves to separate the two pressure zones instead of PRVs does not have an impact on the pressures in Zone 1 or the Gila Service Zone. The 24-inch transmission main on Citrus Road from the Silva Site to Lower Buckeye Road provides the necessary supply to the Gila River Zone at a HGL of 1,100 feet directly from the Silva Site.

In Alternative No. 1, a significant amount of water flows through the PRVs to supply the Gila Service Zone. This requires higher capacity Zone 1 pumps. Without the PRVs, the PH demands from the Zone 1 pumps and the flow through the Zone 1 system would decrease. This lowers the headloss in the water mains and would eliminate the need for the larger water mains on Citrus Road, Harrison Street and Yuma Road. The 30-inch diameter water main from the Silva Site to Citrus Road is still recommended to reduce the headlosses. The recommended water main configuration is shown in Figure No. 3.

In order to meet the required fire flow while maintaining 20 psi under MDD conditions at the end of the 8-inch diameter main on 169th Avenue, the proposed PRV at this location

Mr. Eric Laurin, P.E.
Coe & Van Loo Consultants, Inc.

Page 6 of 6
August 30, 2012

would have to be installed. It is recommended that this PRV be installed and set to operate during fire flow conditions only. Once this water main connects to the planned Gila River Transmission main on Lower Buckeye Road, the PRV will not be necessary. The recommended water main configuration is shown in Figure No. 3.

The 8-inch diameter water main on Illini Street from 185th Avenue to 185th Drive is still recommended to provide a second feed to this neighborhood and increase the available fire flow in the area of 185th Avenue, Raymond Street, Vista Norte Street and 185th Drive. The recommended water main configuration is shown in Figure No. 3.

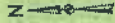
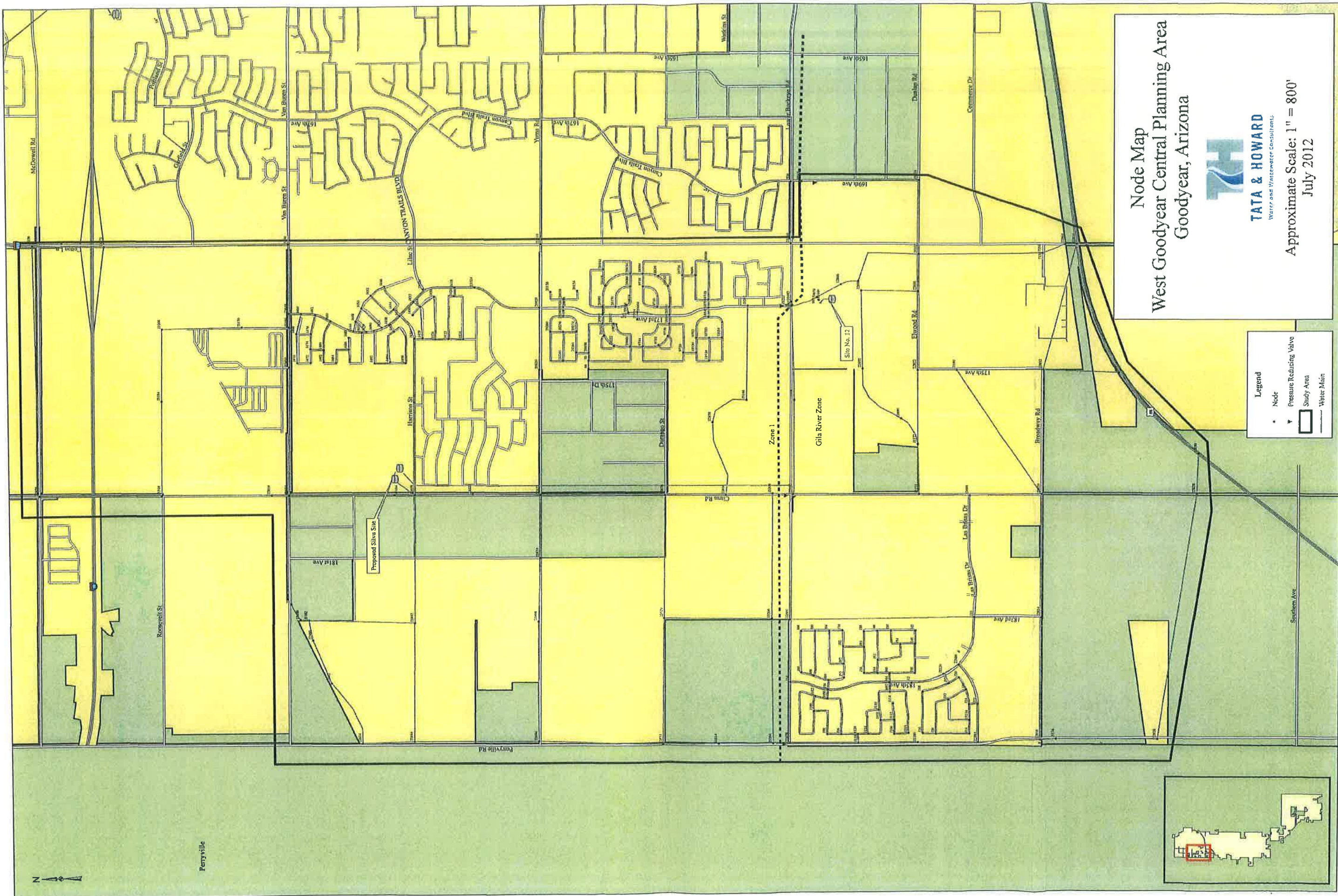
We appreciate the opportunity to assist you on this important project. If you have any questions regarding this letter, please contact our office.

Sincerely,

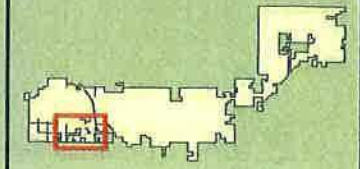
TATA & HOWARD, INC.

A handwritten signature in black ink, appearing to read "Donald J. Tata". The signature is fluid and cursive, with the first name "Donald" and last name "Tata" clearly distinguishable.

Donald J. Tata, P.E.
President



Perryville



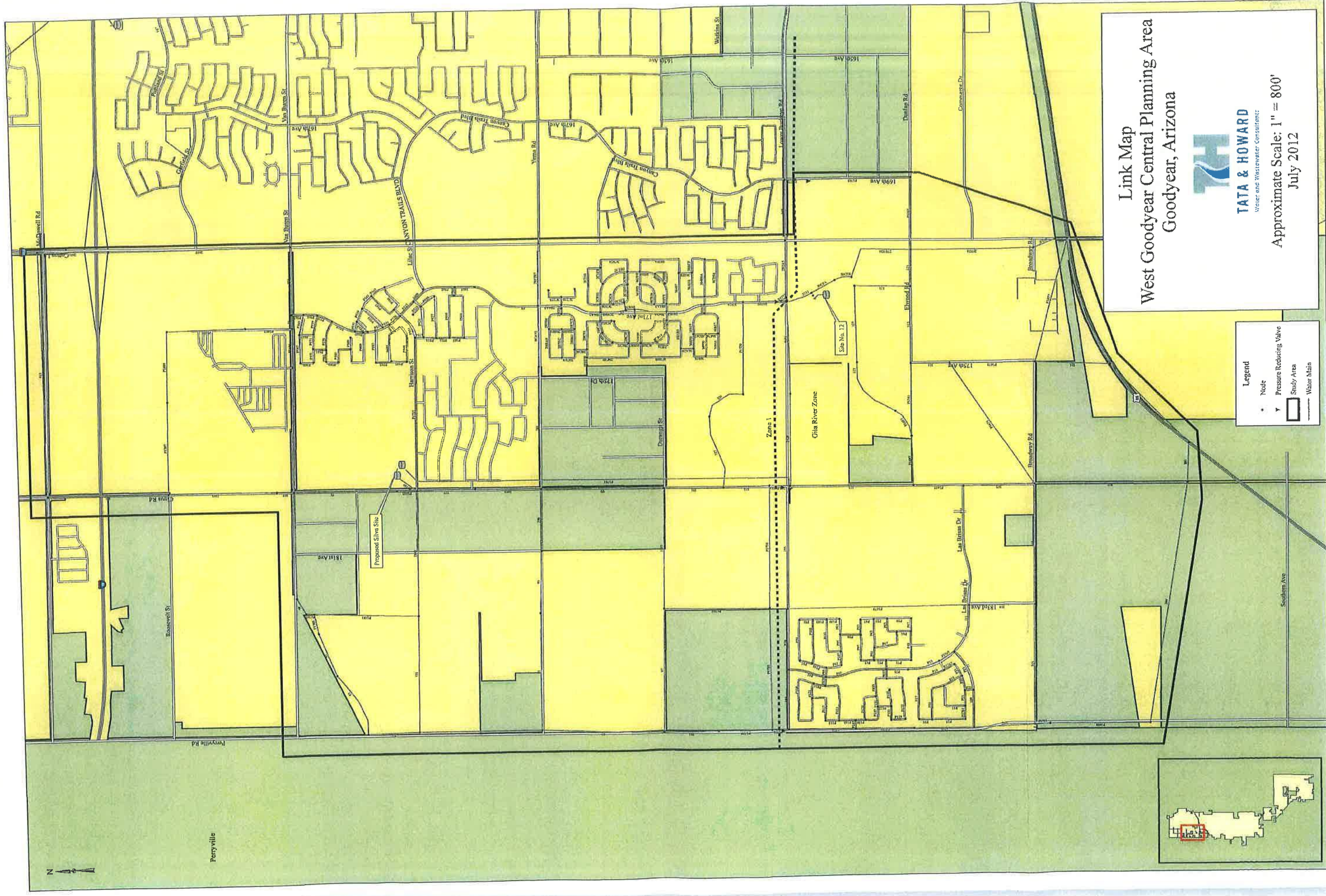
Node Map West Goodyear Central Planning Area Goodyear, Arizona



Approximate Scale: 1" = 800'
July 2012

Legend

- Node
- ▼ Pressure Reducing Valve
- Study Area
- Water Main



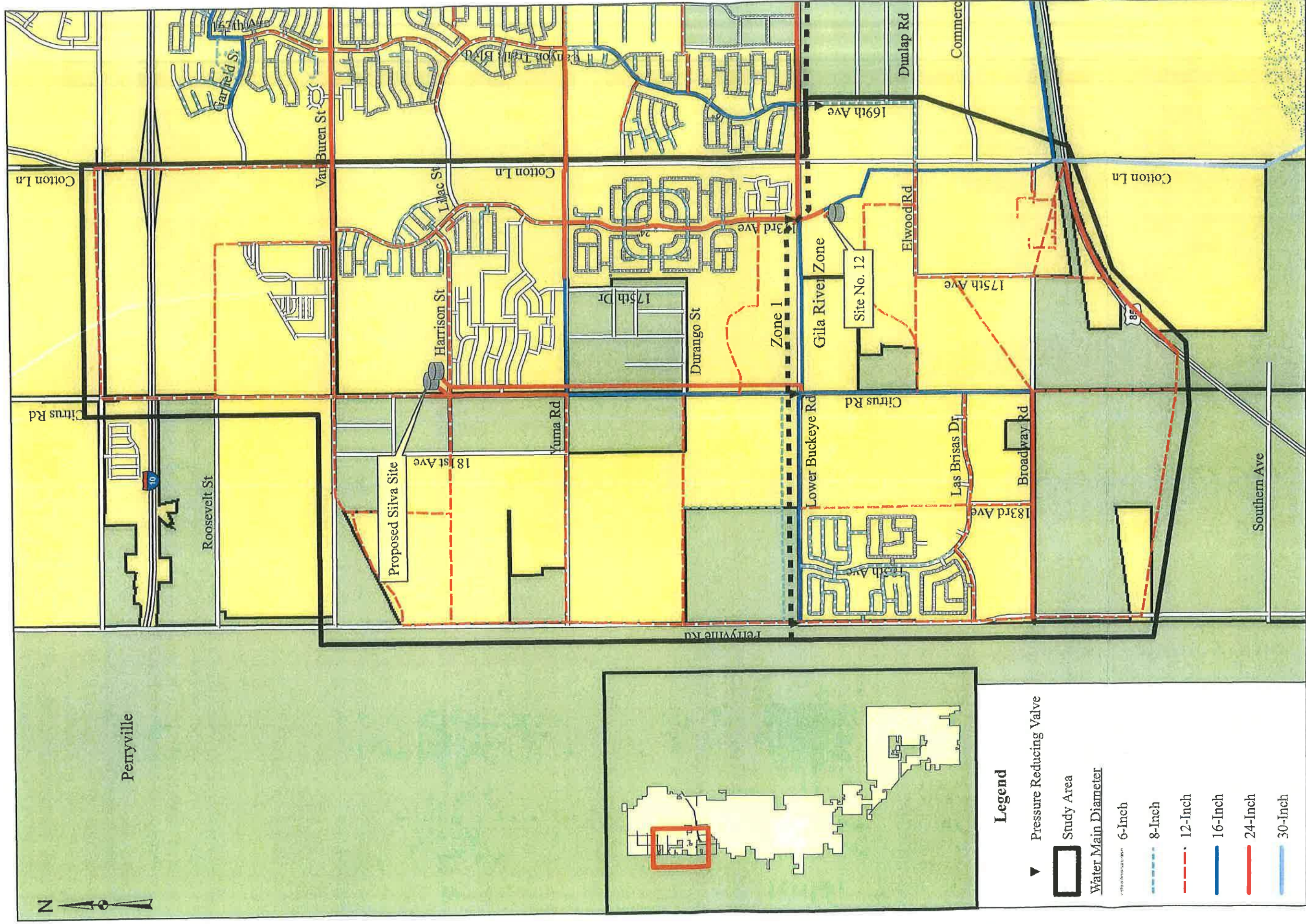
Link Map
West Goodyear Central Planning Area
Goodyear, Arizona



Approximate Scale: 1" = 800'
July 2012

Legend

- Node
- ▽ Pressure Reducing Valve
- Study Area
- Water Main



Legend

▼ Pressure Reducing Valve



Water Main Diameter

6-Inch

8-Inch

12-Inch

16-Inch

24-Inch

30-Inch



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Water and Wastewater Consultants

Date: July 2012

Scale: 1:24,000

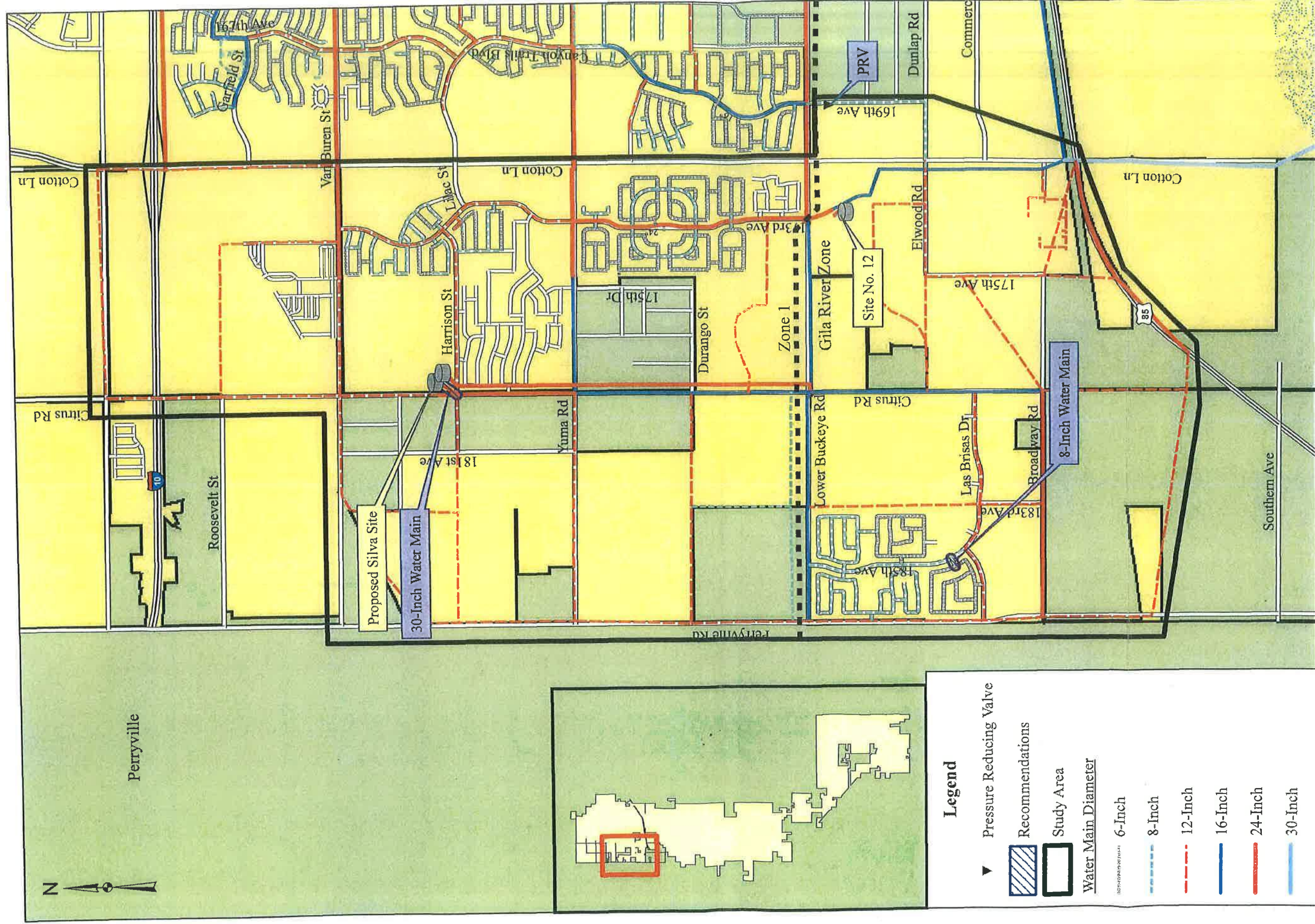
Figure No.

1

Proposed Water Main Configuration

West Goodyear Central Planning Area

Goodyear, Arizona



TATA & HOWARD

Water and Wastewater Consultants

Date: July 2012

Scale: 1:24,000

Alternative No. 2
Recommended Water Main Configuration

West Goodyear Central Planning Area
Goodyear, Arizona

Figure No.

3

**Average Day Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
101	Zone 1	22676	22836	1294	16	140	430	0.69	0.15	0.11
103	Gila River Zone	22678	J34	1290	16	120	170	0.27	0.04	0.03
105	Gila River Zone	22680	22682	2663	16	125	-128	0.2	0.04	0.01
109	Gila River Zone	22684	J22	818	12	120	-5	0.02	0	0
111	Gila River Zone	22686	J10	1112	12	120	53	0.15	0.01	0.01
113	Gila River Zone	22682	J3174	2642	16	125	410	0.65	0.34	0.13
117	Gila River Zone	22690	22692	1460	12	120	3	0.01	0	0
119	Gila River Zone	22692	22694	1640	12	120	-32	0.09	0.01	0
121	Gila River Zone	22694	22696	1179	12	120	-47	0.13	0.01	0.01
123	Gila River Zone	22696	19302	792	12	120	-137	0.39	0.06	0.07
1585	Zone 1	23518	22816	2303	12	120	-175	0.5	0.27	0.12
1593	Zone 1	22698	22842	2701	12	120	376	1.07	1.3	0.48
1597	Zone 1	23520	22676	2604	12	120	-259	0.74	0.63	0.24
15FCCF	Gila River Zone	7136	7138	9	16	125	0	0	0	0
1603	Zone 1	23522	22672	1412	24	140	1809	1.28	0.32	0.23
1605	Zone 1	23524	J418	413	12	120	-136	0.39	0.03	0.07
1609	Zone 1	23526	J432	413	12	120	-89	0.25	0.01	0.03
20408A	Zone 1	6748	18488	801	6	100	3	0.03	0	0
2331	Gila River Zone	9874	10982	552	24	130	-422	0.3	0.01	0.02
2421	Gila River Zone	22684	J3180	1279	12	120	-97	0.27	0.05	0.04
2429	Gila River Zone	23998	22682	1994	16	120	51	0.08	0.01	0
2431	Gila River Zone	23998	10982	1979	16	120	-180	0.29	0.06	0.03
2601	Zone 1	24070	24072	1526	12	120	-21	0.06	0	0
2605	Zone 1	24072	3290	3858	12	120	-21	0.06	0.01	0
275	Zone 1	3290	22648	1465	24	130	-21	0.02	0	0
277	Zone 1	22698	23522	1231	24	140	1809	1.28	0.28	0.23
279	Zone 1	22670	22672	1328	12	125	-286	0.81	0.36	0.27
27B5D8	Gila River Zone	19294	19302	1686	16	125	422	0.67	0.23	0.14
281	Zone 1	20020	22672	2647	16	125	-770	1.23	1.1	0.41
293	Zone 1	22674	J3214	1189	12	120	300	0.85	0.38	0.32
295	Gila River Zone	22684	22818	1316	12	120	102	0.29	0.06	0.04

**Average Day Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
299	Gila River Zone	22826	22828	5264	12	120	-19	0.06	0.01	0
29F2B7	Zone 1	20028	22810	1388	24	130	0	0	0	0
2B2A5	Zone 1	20482	22850	1228	24	125	0	0	0	0
2B539	Zone 1	19990	20090	172	8	110	57	0.36	0.02	0.12
2B5CF	Zone 1	18542	18796	191	8	110	-31	0.2	0.01	0.04
2B5D2	Zone 1	18796	6748	170	8	110	16	0.1	0	0.01
2B5EF	Zone 1	18796	20350	839	24	130	-618	0.44	0.03	0.04
2B624	Zone 1	20350	18610	170	8	110	18	0.11	0	0.01
2B627	Zone 1	18666	20350	189	8	110	-32	0.21	0.01	0.04
2B62A	Zone 1	20350	20004	700	24	130	-670	0.47	0.03	0.04
2B64A	Zone 1	20344	20004	154	6	100	0	0	0	0
2B6A2	Zone 1	19990	20014	861	24	130	-817	0.58	0.05	0.06
2B6A5	Zone 1	20014	20028	499	24	130	-904	0.64	0.04	0.07
2B6CA	Zone 1	20326	20014	70	8	110	-77	0.49	0.01	0.21
2B7B6	Zone 1	20260	20290	549	6	100	-39	0.45	0.17	0.3
2B7CE	Zone 1	20274	20290	547	6	100	-34	0.38	0.12	0.22
2B7D4	Zone 1	20290	20326	117	8	110	-74	0.47	0.02	0.2
2B7E9	Zone 1	20264	20286	439	6	100	16	0.18	0.02	0.05
2B7EC	Zone 1	20286	20256	611	6	100	-1	0.01	0	0
2BB61	Zone 1	20264	20274	440	6	100	-5	0.06	0	0.01
2BBA9	Zone 1	20286	20260	881	6	100	8	0.09	0.01	0.02
2BBBB	Zone 1	20274	20256	269	6	100	22	0.25	0.03	0.1
2BBF9	Zone 1	20256	20260	269	6	100	16	0.18	0.02	0.06
2BC66	Zone 1	70	20038	170	6	100	3	0.04	0	0
2BC6C	Zone 1	20038	20264	269	6	100	15	0.17	0.01	0.05
2BC6F	Zone 1	70	20060	1169	6	100	-11	0.12	0.03	0.03
2BC7E	Zone 1	20060	18828	680	6	100	-11	0.13	0.02	0.03
2BC8B	Zone 1	20030	19990	186	8	110	-74	0.47	0.04	0.2
2BC91	Zone 1	20038	20030	891	6	100	-18	0.2	0.06	0.07
2BC97	Zone 1	20060	20222	353	8	110	-22	0.14	0.01	0.02
2BC9D	Zone 1	20050	20222	307	8	110	26	0.16	0.01	0.03

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2BCA0	Zone 1	20222	20050	562	6	100	-8	0.09	0.01	0.02
2BCAC	Zone 1	20030	20050	258	8	110	38	0.24	0.02	0.06
2C1AC	Zone 1	18594	20034	270	8	110	-29	0.19	0.01	0.04
2C1B2	Zone 1	20034	20118	611	8	110	-18	0.11	0.01	0.01
2C1C4	Zone 1	20086	20176	626	6	100	-8	0.09	0.01	0.02
2C1CE	Zone 1	20176	18818	233	6	100	0	0	0	0
2C1D7	Zone 1	18818	20086	426	6	100	10	0.11	0.01	0.02
2C1EF	Zone 1	20104	20118	360	6	100	-6	0.07	0	0.01
2C210	Zone 1	20090	20104	1282	6	100	9	0.1	0.02	0.02
2C21D	Zone 1	20014	20076	171	8	110	9	0.06	0	0
2C220	Zone 1	20156	20076	459	8	110	-7	0.04	0	0
2C223	Zone 1	20076	20158	422	8	110	2	0.01	0	0
2C5DE	Zone 1	20006	18818	172	6	100	12	0.14	0.01	0.03
2C91E	Zone 1	20090	20118	449	8	110	33	0.21	0.02	0.05
2C924	Zone 1	20104	20034	1006	6	100	4	0.05	0.01	0
2C930	Zone 1	20176	20090	270	6	100	-11	0.12	0.01	0.03
2C937	Zone 1	20086	20034	270	6	100	14	0.16	0.01	0.04
2C95A	Zone 1	20052	20030	234	6	100	-13	0.15	0.01	0.04
2C9A6	Zone 1	20004	20006	192	24	130	-671	0.48	0.01	0.04
2C9BB	Zone 1	19990	20006	539	24	130	684	0.49	0.02	0.04
2FE88	Gila River Zone	22864	7138	536	16	125	-210	0.34	0.02	0.04
2FF4	Gila River Zone	7138	19302	2608	16	125	-210	0.34	0.1	0.04
301	Gila River Zone	22828	22830	849	12	120	-84	0.24	0.03	0.03
303	Gila River Zone	22830	22824	2392	24	120	-196	0.14	0.01	0
305	Gila River Zone	22688	22820	1511	16	125	170	0.27	0.04	0.03
307	Gila River Zone	22820	22828	3294	12	120	48	0.14	0.03	0.01
311	Gila River Zone	22822	13160	818	12	120	93	0.26	0.03	0.04
313	Gila River Zone	22822	22696	1655	12	120	-61	0.17	0.03	0.02
315	Gila River Zone	22818	22834	2599	24	125	-75	0.05	0	0
317	Gila River Zone	22834	22820	2599	24	130	7	0	0	0
319	Gila River Zone	22834	110	1433	12	120	-81	0.23	0.04	0.03

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
321	Gila River Zone	22824	22832	1628	12	120	-37	0.1	0.01	0.01
323	Zone 1	22836	J3208	982	16	140	81	0.13	0.01	0.01
32324	Zone 1	18796	J3202	840	24	130	569	0.4	0.03	0.03
327	Zone 1	22836	22838	1602	12	120	212	0.6	0.27	0.17
329	Zone 1	22838	J3186	976	12	120	137	0.39	0.07	0.07
331	Zone 1	22664	22842	2517	12	120	-153	0.43	0.23	0.09
335	Zone 1	22816	22652	366	12	120	-175	0.5	0.04	0.12
343	Zone 1	22850	J506	1304	24	130	0	0	0	0
353	Gila River Zone	22824	22854	2889	24	125	-197	0.14	0.01	0
35ACD	Zone 1	9738	18666	261	8	110	-13	0.08	0	0.01
35B3D	Zone 1	20060	9744	269	8	110	13	0.08	0	0.01
3.50E+90	Zone 1	18666	9744	954	6	100	3	0.03	0	0
35F26	Zone 1	9738	9732	567	6	100	2	0.02	0	0
35FF8	Zone 1	18610	18632	466	8	110	2	0.01	0	0
36080	Zone 1	18630	18632	532	6	100	1	0.01	0	0
36095	Zone 1	18630	18594	337	8	110	-12	0.08	0	0.01
3.61E+04	Zone 1	18632	18630	301	8	110	-2	0.02	0	0
361FD	Zone 1	9718	9710	662	6	100	1	0.01	0	0
3.62E+02	Zone 1	18594	9718	270	6	100	5	0.06	0	0.01
36497	Zone 1	18610	10716	931	6	100	10	0.11	0.02	0.02
364F9	Zone 1	10716	9690	270	6	100	11	0.13	0.01	0.03
366FB	Zone 1	9702	18530	310	6	100	-3	0.04	0	0
36879	Zone 1	11034	10720	269	6	100	1	0.01	0	0
3.68E+09	Zone 1	11034	18542	691	6	100	-7	0.07	0.01	0.01
36919	Zone 1	18542	9702	600	6	100	6	0.07	0.01	0.01
36956	Zone 1	11034	18536	749	6	100	1	0.01	0	0
36959	Zone 1	18536	18530	439	6	100	-5	0.05	0	0.01
36990	Zone 1	10720	18536	480	6	100	1	0.02	0	0
36AD9	Zone 1	9726	18530	269	6	100	11	0.13	0.01	0.03
36AFA	Zone 1	6748	9690	786	6	100	-1	0.01	0	0
36BCF	Zone 1	9690	18488	587	6	100	4	0.04	0	0

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3.91E+10	Zone 1	70	66	178	6	100	3	0.03	0	0
395	Gila River Zone	22864	22854	256	30	130	210	0.1	0	0
411	Zone 1	22876	23518	2595	12	120	21	0.06	0.01	0
4.13E+02	Zone 1	22876	24070	5276	12	120	-21	0.06	0.01	0
4E98B	Gila River Zone	13444	13440	93	20	130	0	0	0	0
4E991	Gila River Zone	13440	9876	66	20	130	0	0	0	0
50CFA	Gila River Zone	9876	12866	562	16	125	422	0.67	0.08	0.14
50CFB	Gila River Zone	19294	12866	382	16	125	-422	0.67	0.05	0.14
593	Zone 1	20052	18828	57	6	100	12	0.14	0	0.03
69	Zone 1	20028	23524	1486	12	120	-136	0.39	0.11	0.07
71	Zone 1	22648	13166	288	24	130	54	0.04	0	0
73	Zone 1	22652	22650	2698	12	120	163	0.46	0.28	0.1
75	Zone 1	22652	13164	2218	12	120	-443	1.26	1.44	0.65
77	Zone 1	22652	22656	2296	12	120	4	0.01	0	0
79	Zone 1	22656	22658	394	12	120	-10	0.03	0	0
83	Zone 1	22660	22662	987	12	120	85	0.24	0.03	0.03
85	Zone 1	22654	22662	1480	12	120	-59	0.17	0.02	0.02
87	Zone 1	22654	22664	1100	12	120	33	0.09	0.01	0.01
89	Zone 1	22664	22666	2616	12	120	124	0.35	0.16	0.06
8B1A3	Zone 1	9710	18610	270	6	100	-1	0.01	0	0
8B1B5	Zone 1	9726	18666	903	6	100	-11	0.13	0.03	0.03
8B397	Zone 1	10720	9702	269	6	100	-4	0.05	0	0
8B39A	Zone 1	10716	18594	1422	6	100	-8	0.09	0.02	0.02
8C9E0	Gila River Zone	9874	9876	14	24	130	422	0.3	0	0.02
8CA72	Zone 1	20020	20028	1309	24	130	769	0.55	0.07	0.05
8CB0B	Zone 1	9744	9726	1339	6	100	9	0.1	0.02	0.02
8CB0E	Zone 1	9744	9732	348	8	110	0	0	0	0
8CB14	Zone 1	9732	9738	281	8	110	-6	0.04	0	0
8CB29	Zone 1	9710	9718	656	6	100	-1	0.01	0	0
8CB54	Zone 1	6748	18488	1299	6	100	2	0.03	0	0
91	Zone 1	22666	22668	2538	12	120	-198	0.56	0.37	0.15

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93	Zone 1	22668	22670	1341	12	125	-286	0.81	0.36	0.27
95	Zone 1	22666	22674	2634	12	120	243	0.69	0.56	0.21
97	Zone 1	22674	23520	2678	12	120	-146	0.42	0.22	0.08
99	Zone 1	22672	22676	2628	16	140	731	1.17	0.8	0.3
P101	Gila River Zone	J88	J80	325	8	100	-7	0.04	0	0
P103	Gila River Zone	J90	J94	298	8	100	7	0.04	0	0
P105	Gila River Zone	J88	J90	954	8	100	4	0.02	0	0
P107	Gila River Zone	J92	J72	292	8	100	-8	0.05	0	0
P109	Gila River Zone	J94	J70	273	8	100	6	0.04	0	0
P11	Gila River Zone	J10	22688	2594	12	120	13	0.04	0	0
P111	Gila River Zone	J92	J94	973	8	100	0	0	0	0
P113	Gila River Zone	J96	J690	1028	8	100	-11	0.07	0.01	0.01
P115	Gila River Zone	J96	J98	295	8	100	-9	0.06	0	0
P117	Gila River Zone	J100	J98	803	8	100	9	0.06	0	0.01
P119	Gila River Zone	J102	J100	2012	8	100	3	0.02	0	0
P121	Gila River Zone	J100	J102	326	8	100	-7	0.04	0	0
P123	Gila River Zone	J104	J692	1241	8	100	7	0.04	0	0
P125	Gila River Zone	J104	J106	295	8	100	-7	0.04	0	0
P127	Gila River Zone	J108	J112	296	8	100	7	0.04	0	0
P129	Gila River Zone	J110	J116	751	8	100	-9	0.06	0	0.01
P13	Gila River Zone	J12	J3220	692	8	120	58	0.37	0.08	0.11
P131	Gila River Zone	J108	J110	247	8	100	4	0.02	0	0
P133	Gila River Zone	J112	J106	299	8	100	7	0.04	0	0
P135	Gila River Zone	J112	J114	352	8	100	0	0	0	0
P137	Gila River Zone	J116	J108	542	8	100	11	0.07	0	0.01
P139	Gila River Zone	J116	J120	222	8	100	-20	0.13	0	0.02
P141	Gila River Zone	J118	22678	1447	12	120	-183	0.52	0.18	0.13
P143	Gila River Zone	J120	J96	354	8	100	-21	0.13	0.01	0.02
P145	Gila River Zone	J118	J120	179	8	100	-1	0	0	0
P15	Gila River Zone	J14	J28	717	6	100	0	0	0	0
P1673	Gila River Zone	J3160	22832	1828	12	120	24	0.07	0.01	0

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P1675	Gila River Zone	22820	J3160	3184	12	120	-34	0.1	0.02	0.01
P1677	Trans	22854	22832	2761	12	120	13	0.04	0	0
P1679	Gila River Zone	J10	22680	3887	12	120	-153	0.43	0.35	0.09
P1681	Zone 1	22842	J3182	2240	12	120	132	0.37	0.15	0.07
P1683	Zone 1	J3164	22698	424	24	120	-458	0.32	0.01	0.02
P1685	Zone 1	J3166	22650	839	24	130	-99	0.07	0	0
P1687	Zone 1	J3166	J3170	990	12	120	110	0.31	0.05	0.05
P1689	Zone 1	J3168	J3184	1530	12	120	-15	0.04	0	0
P1691	Zone 1	J3170	J3168	1670	12	120	67	0.19	0.03	0.02
P1693	Gila River Zone	J3172	22690	666	12	120	3	0.01	0	0
P1695	Gila River Zone	J3174	22688	1070	16	125	250	0.4	0.06	0.05
P1697	Gila River Zone	J3172	J3174	1059	12	100	-78	0.22	0.04	0.04
P1699	Gila River Zone	J3176	22826	2161	12	120	37	0.1	0.01	0.01
P17	Gila River Zone	J18	J16	882	6	100	0	0	0	0
P1701	Gila River Zone	J3180	J118	1247	12	120	-184	0.52	0.16	0.13
P1703	Zone 1	J3182	22658	174	12	120	21	0.06	0	0
P1705	Zone 1	22660	J3182	435	12	120	-85	0.24	0.01	0.03
P1707	Zone 1	J3184	23518	1989	12	120	-75	0.21	0.05	0.02
P1711	Gila River Zone	J3176	22818	341	12	120	-149	0.42	0.03	0.09
P1715	Zone 1	22698	J430	3296	12	120	358	1.01	1.44	0.44
P1727	Zone 1	J3202	J3222	809	24	130	650	0.46	0.03	0.04
P1729	Zone 1	J3186	J3202	1983	12	120	100	0.28	0.08	0.04
P1731	Zone 1	J3204	V8000	242	12	120	383	1.09	0.12	0.5
P1733	Zone 1	J3208	V8002	216	16	140	0	0	0	0
P1735	Zone 1	J3204	J3206	2639	8	120	-105	0.67	0.86	0.33
P1737	Zone 1	J3206	23520	2281	8	120	-25	0.16	0.05	0.02
P1739	Zone 1	J3206	J3208	2639	8	120	-81	0.51	0.53	0.2
P1741	Gila River Zone	J3172	22822	1567	12	120	31	0.09	0.01	0
P1743	Zone 1	J506	V8006	94	8	120	0	0	0	0
P1745	Gila River Zone	J3212	J3210	2444	8	120	0	0	0	0
P1747	Gila River Zone	19302	J3210	1563	8	120	0	0	0	0

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P1749	Zone 1	RES9006	22698	551	24	120	3023	2.14	0.43	0.78
P1751	Gila River Zone	RES9008	22682	8488	24	120	557	0.39	0.29	0.03
P1753	Zone 1	V8000	22678	115	12	120	383	1.09	0.06	0.5
P1755	Zone 1	V8002	22682	223	16	140	0	0	0	0
P1757	Zone 1	V8004	10982	93	24	130	650	0.46	0	0.04
P1759	Zone 1	J3214	J3204	1149	12	120	277	0.79	0.31	0.27
P1761	Gila River Zone	J3216	J14	294	6	100	0	0	0	0
P1763	Gila River Zone	J3218	J20	248	6	100	0	0	0	0
P1765	Gila River Zone	J3220	22686	382	8	120	58	0.37	0.04	0.11
P1769	Zone 1	J3222	V8004	28	24	130	650	0.46	0	0.04
P1771	Zone 1	J3222	20482	130	24	125	0	0	0	0
P1773	Gila River Zone	V8006	J3212	132	8	120	0	0	0	0
P19	Gila River Zone	J18	J3218	580	6	100	0	0	0	0
P21	Gila River Zone	J20	J26	297	6	100	0	0	0	0
P23	Gila River Zone	J22	22686	945	12	120	-5	0.02	0	0
P25	Gila River Zone	J24	J3216	332	6	100	0	0	0	0
P27	Gila River Zone	J22	J24	182	6	100	0	0	0	0
P29	Gila River Zone	J26	J24	327	6	100	0	0	0	0
P31	Gila River Zone	J28	J16	297	6	100	0	0	0	0
P33	Gila River Zone	J28	J32	930	6	100	0	0	0	0
P35	Gila River Zone	J32	J26	443	6	100	0	0	0	0
P37	Gila River Zone	J32	J3216	877	6	100	0	0	0	0
P39	Gila River Zone	J34	22680	1317	16	120	112	0.18	0.02	0.01
P41	Gila River Zone	J34	J78	821	8	100	59	0.38	0.13	0.16
P43	Gila River Zone	J38	J84	331	6	100	-7	0.08	0	0.01
P45	Gila River Zone	J36	J44	285	6	100	7	0.08	0	0.01
P47	Gila River Zone	J38	J46	285	6	100	7	0.08	0	0.01
P49	Gila River Zone	J40	J48	626	6	100	-5	0.05	0	0.01
P501	Zone 1	J418	23526	675	12	120	-89	0.25	0.02	0.03
P503	Zone 1	J418	J420	204	8	120	-47	0.3	0.02	0.07
P505	Zone 1	J420	J422	1044	8	120	-35	0.22	0.04	0.04

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P507	Zone 1	J422	J424	310	8	120	17	0.11	0	0.01
P509	Zone 1	J424	J420	1080	6	120	15	0.17	0.04	0.04
P51	Gila River Zone	J44	J60	256	6	100	10	0.11	0.01	0.02
P511	Zone 1	J422	J426	272	8	120	-55	0.35	0.03	0.1
P513	Zone 1	J426	J428	280	8	120	-70	0.45	0.04	0.15
P515	Zone 1	J428	J430	174	8	120	-100	0.64	0.05	0.3
P517	Zone 1	J432	J440	422	12	120	-66	0.19	0.01	0.02
P519	Zone 1	J432	J434	184	12	100	-46	0.13	0	0.01
P521	Zone 1	J434	J428	665	6	120	-31	0.35	0.09	0.13
P523	Zone 1	J436	J434	240	12	100	0	0	0	0
P525	Zone 1	J434	J438	356	6	120	-15	0.17	0.01	0.04
P527	Zone 1	J438	J426	930	6	120	-15	0.17	0.03	0.04
P529	Zone 1	J440	J458	291	12	120	149	0.42	0.03	0.09
P53	Gila River Zone	J46	J50	290	6	100	4	0.05	0	0.01
P531	Zone 1	J430	J440	584	12	120	254	0.72	0.14	0.23
P533	Zone 1	J442	J490	185	12	120	115	0.33	0.01	0.05
P535	Zone 1	J444	J460	531	12	120	126	0.36	0.03	0.06
P537	Zone 1	J444	J448	216	8	120	-39	0.25	0.01	0.05
P539	Zone 1	J448	J450	302	8	120	-40	0.25	0.02	0.05
P541	Zone 1	J450	J452	339	8	120	-31	0.2	0.01	0.03
P543	Zone 1	J452	J446	347	8	120	-22	0.14	0.01	0.02
P545	Zone 1	J446	J454	614	8	120	-22	0.14	0.01	0.02
P547	Zone 1	J454	J452	681	6	120	13	0.14	0.02	0.03
P549	Zone 1	J454	J440	191	8	120	-37	0.24	0.01	0.05
P55	Gila River Zone	J44	J52	279	6	100	-3	0.03	0	0
P551	Zone 1	J442	J450	596	8	120	11	0.07	0	0
P553	Zone 1	J456	J502	98	12	120	115	0.33	0.01	0.05
P555	Zone 1	J456	J448	312	8	120	2	0.01	0	0
P557	Zone 1	J458	J442	163	12	120	128	0.36	0.01	0.06
P559	Zone 1	J460	J462	346	12	120	119	0.34	0.02	0.06
P561	Zone 1	J462	J464	303	12	120	110	0.31	0.02	0.05

**Average Day Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P563	Zone 1	J464	J2648	251	12	120	135	0.38	0.02	0.07
P565	Zone 1	J464	J468	431	8	120	-25	0.16	0.01	0.02
P567	Zone 1	J468	J470	606	6	120	-7	0.08	0.01	0.01
P569	Zone 1	J470	J472	277	6	120	-7	0.08	0	0.01
P57	Gila River Zone	J48	J42	279	6	100	-2	0.02	0	0
P571	Zone 1	J472	J474	289	6	120	-7	0.08	0	0.01
P573	Zone 1	J474	J476	317	6	120	11	0.12	0.01	0.02
P577	Zone 1	J476	J462	413	8	120	-9	0.06	0	0
P579	Zone 1	J460	J480	637	8	120	7	0.04	0	0
P581	Zone 1	J480	J482	260	8	120	-14	0.09	0	0.01
P583	Zone 1	J482	J484	261	8	120	-17	0.11	0	0.01
P585	Zone 1	J484	J486	538	8	120	-21	0.13	0.01	0.02
P589	Zone 1	J486	J488	249	8	120	0	0	0	0
P59	Gila River Zone	J50	J42	507	6	100	2	0.02	0	0
P591	Zone 1	J490	J456	160	12	120	119	0.34	0.01	0.06
P593	Zone 1	J490	J492	685	6	120	-7	0.07	0.01	0.01
P595	Zone 1	J492	J494	340	6	120	-11	0.13	0.01	0.02
P597	Zone 1	J494	J496	329	8	120	-8	0.05	0	0
P599	Zone 1	J496	J498	950	8	120	-11	0.07	0	0
P601	Zone 1	J498	J458	166	8	120	-20	0.13	0	0.02
P605	Zone 1	J494	J498	713	6	120	-7	0.07	0.01	0.01
P607	Zone 1	J502	J444	178	12	120	88	0.25	0.01	0.03
P609	Zone 1	J486	J502	1150	8	120	-26	0.16	0.03	0.02
P61	Gila River Zone	J48	J54	302	6	100	-2	0.03	0	0
P611	Zone 1	J480	J474	278	6	120	18	0.2	0.01	0.05
P613	Zone 1	J476	J468	306	8	120	18	0.12	0	0.01
P63	Gila River Zone	J52	J46	615	6	100	-3	0.04	0	0
P65	Gila River Zone	J54	J50	462	6	100	-2	0.02	0	0
P67	Gila River Zone	J52	J54	749	6	100	0	0	0	0
P71	Gila River Zone	J60	J40	524	6	100	-5	0.05	0	0.01
P75	Gila River Zone	J64	J12	457	8	100	58	0.37	0.07	0.15

**Average Day Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P77	Gila River Zone	J64	J60	194	6	100	-15	0.17	0.01	0.05
P79	Gila River Zone	J66	J68	876	8	100	3	0.02	0	0
P81	Gila River Zone	J68	J90	289	8	100	3	0.02	0	0
P83	Gila River Zone	J70	J82	335	8	100	6	0.04	0	0
P831	Gila River Zone	J690	J102	258	8	100	9	0.06	0	0
P833	Gila River Zone	J690	J78	197	8	110	-21	0.13	0	0.02
P835	Gila River Zone	J692	J110	638	8	100	-13	0.08	0.01	0.01
P837	Gila River Zone	J692	J64	203	8	100	20	0.13	0	0.02
P87	Gila River Zone	J66	J88	265	8	100	-3	0.02	0	0
P89	Gila River Zone	J78	J64	1325	8	100	24	0.15	0.04	0.03
P91	Gila River Zone	J80	J72	337	8	100	8	0.05	0	0
P93	Gila River Zone	J78	J80	199	8	100	15	0.09	0	0.01
P95	Gila River Zone	J82	J92	370	8	100	-8	0.05	0	0
P97	Gila River Zone	J84	J36	552	6	100	7	0.08	0.01	0.01
P99	Gila River Zone	J82	J84	447	8	100	15	0.09	0.01	0.01

Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
10716		Zone 1	7	955	1163	90
10720		Zone 1	3	958	1163	89
10982	45	Gila River Zone	48	944	1100	67
11034		Zone 1	5	956	1163	89
12866		Gila River Zone	0	937	1100	71
13440		Gila River Zone	0	938	1100	70
18488		Zone 1	9	951	1163	92
18530		Zone 1	3	961	1163	87
18536		Zone 1	7	961	1163	88
18542		Zone 1	18	956	1163	90
18594		Zone 1	4	959	1163	88
18610		Zone 1	5	959	1163	88
18630		Zone 1	9	965	1163	86
18632		Zone 1	5	957	1163	89
18666		Zone 1	5	961	1163	87
18796		Zone 1	2	955	1163	90
18818		Zone 1	3	955	1163	90
18828		Zone 1	1	975	1163	81
19294		Gila River Zone	0	925	1100	76
19302	44	Gila River Zone	75	935	1099	71
19990		Zone 1	2	966	1163	85
20004		Zone 1	1	955	1163	90
20006		Zone 1	1	964	1163	86
20014		Zone 1	2	969	1163	84
20020		Zone 1	1	975	1163	81
20028	46	Zone 1	1	971	1163	83
20030		Zone 1	4	967	1163	85
20034		Zone 1	7	960	1163	88
20038		Zone 1	7	971	1163	83
20050		Zone 1	5	968	1163	85
20052		Zone 1	1	966	1163	85

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
20060		Zone 1	10	967	1163	85
20076		Zone 1	0	968	1163	84
20086		Zone 1	4	961	1163	87
20090		Zone 1	4	965	1163	86
20104		Zone 1	11	963	1163	87
20118		Zone 1	9	964	1163	86
20156		Zone 1	7	966	1163	85
20158		Zone 1	2	969	1163	84
20176		Zone 1	3	964	1163	86
20222		Zone 1	12	968	1163	84
20256		Zone 1	5	971	1163	83
20260		Zone 1	63	972	1163	83
20264		Zone 1	5	969	1163	84
20274		Zone 1	6	970	1163	84
20286		Zone 1	8	973	1163	82
20290		Zone 1	1	970	1163	84
20326		Zone 1	3	969	1163	84
20344		Zone 1	0	963	1163	86
20350		Zone 1	2	960	1163	88
20482		Zone 1	0	944	1163	95
22648	48	Zone 1	60	1005	1163	68
22650	20	Zone 1	64	998	1163	71
22652	15	Zone 1	101	1000	1163	71
22654	9	Zone 1	26	1003	1163	69
22656	14	Zone 1	14	1003	1163	69
22658	13	Zone 1	11	1004	1163	69
22660	11	Zone 1	0	1003	1163	70
22662	10	Zone 1	26	1003	1163	69
22664	8	Zone 1	62	996	1163	72
22666	7	Zone 1	79	980	1163	79
22668	24	Zone 1	88	974	1163	82

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
22670		Zone 1	0	965	1164	86
22672	25	Zone 1	22	985	1164	78
22674	6	Zone 1	89	963	1162	86
22676	26	Zone 1	42	958	1163	89
22678	5	Gila River Zone	29	945	1100	67
22680	27	Gila River Zone	86	944	1100	68
22682	31	Gila River Zone	70	940	1100	69
22684		Gila River Zone	0	927	1099	74
22686		Gila River Zone	0	925	1099	76
22688	38	Gila River Zone	93	915	1099	80
22690		Gila River Zone	0	926	1099	75
22692	35	Gila River Zone	35	944	1099	67
22694	36	Gila River Zone	15	935	1099	71
22696	40	Gila River Zone	28	928	1099	74
22698	22	Zone 1	22	989	1165	76
22810	50	Zone 1	0	967	1163	85
22816		Zone 1	0	1005	1163	69
22818	3	Gila River Zone	28	910	1099	82
22820	41	Gila River Zone	163	905	1099	84
22822		Gila River Zone	0	930	1099	73
22824	53	Gila River Zone	38	895	1099	89
22826	1	Gila River Zone	56	896	1099	88
22828	51	Gila River Zone	112	905	1099	84
22830	52	Gila River Zone	112	905	1099	84
22832	42	Gila River Zone	0	905	1099	84
22834		Gila River Zone	0	912	1099	81
22836	28	Zone 1	137	955	1163	90
22838	29	Zone 1	75	965	1163	86
22842	23	Zone 1	92	995	1163	73
22850		Zone 1	0	939	1163	97
22854	43	Gila River Zone	0	910	1099	82

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
22864		Gila River Zone	0	911	1099	81
22876		Zone 1	0	1025	1163	60
23518	16	Zone 1	121	1015	1163	64
23520	26.1	Zone 1	88	959	1163	88
23522		Zone 1	0	983	1164	78
23524		Zone 1	0	975	1163	81
23526		Zone 1	0	980	1163	79
23998	32	Gila River Zone	129	952	1100	64
24070		Zone 1	0	1019	1163	62
24072		Zone 1	0	1014	1163	64
3290	49	Zone 1	0	992	1163	74
66		Zone 1	3	972	1163	83
6748		Zone 1	12	954	1163	90
70		Zone 1	4	971	1163	83
7136		Gila River Zone	0	914	1099	80
7138		Gila River Zone	0	914	1099	80
9690		Zone 1	6	954	1163	91
9702		Zone 1	5	959	1163	88
9710		Zone 1	3	960	1163	88
9718		Zone 1	3	960	1163	88
9726		Zone 1	9	962	1163	87
9732		Zone 1	7	964	1163	86
9738		Zone 1	5	962	1163	87
9744		Zone 1	8	966	1163	85
9874		Gila River Zone	0	940	1100	69
9876		Gila River Zone	0	940	1100	69
J10	37	Gila River Zone	112	918	1099	79
J100		Gila River Zone	0	939	1100	70
J102		Gila River Zone	0	938	1100	70
J104		Gila River Zone	0	926	1100	75
J106		Gila River Zone	0	928	1100	74

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J108		Gila River Zone	0	930	1100	73
J110		Gila River Zone	0	930	1100	73
J112		Gila River Zone	0	928	1100	74
J114		Gila River Zone	0	928	1100	74
J116		Gila River Zone	0	931	1100	73
J118		Gila River Zone	0	934	1100	72
J12		Gila River Zone	0	926	1099	75
J120		Gila River Zone	0	934	1100	72
J14		Gila River Zone	0	919	1099	78
J16		Gila River Zone	0	924	1099	76
J18		Gila River Zone	0	924	1099	76
J20		Gila River Zone	0	920	1099	78
J22		Gila River Zone	0	917	1099	79
J24		Gila River Zone	0	918	1099	79
J26		Gila River Zone	0	919	1099	78
J28		Gila River Zone	0	922	1099	77
J3160	39	Gila River Zone	35	913	1099	81
J3164	21	Zone 1	15	988	1165	77
J3166	19	Zone 1	43	994	1163	73
J3168	18	Zone 1	82	1010	1163	66
J3170	18.1	Zone 1	43	999	1163	71
J3172	34	Gila River Zone	44	927	1099	75
J3174	33	Gila River Zone	82	920	1099	78
J3176	2	Gila River Zone	112	906	1099	84
J3180	4	Gila River Zone	87	925	1099	76
J3182	12	Zone 1	26	1000	1163	71
J3184	17	Zone 1	60	1012	1163	65
J3186	30	Zone 1	37	952	1163	91
J32		Gila River Zone	0	921	1099	77
J3202	45.1	Zone 1	19	950	1163	92
J3204		Zone 1	0	944	1162	94

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J3206		Zone 1	0	943	1162	95
J3208		Zone 1	0	940	1163	97
J3210		Gila River Zone	0	924	1099	76
J3212		Gila River Zone	0	938	1099	70
J3214	5.1	Zone 1	23	954	1162	90
J3216		Gila River Zone	0	917	1099	79
J3218		Gila River Zone	0	921	1099	77
J3220		Gila River Zone	0	922	1099	77
J3222		Zone 1	0	944	1163	95
J34		Gila River Zone	0	942	1100	68
J36		Gila River Zone	0	932	1100	73
J38		Gila River Zone	0	932	1100	73
J40		Gila River Zone	0	925	1100	76
J418		Zone 1	0	975	1163	81
J42		Gila River Zone	0	926	1100	75
J420		Zone 1	3	975	1163	81
J422		Zone 1	3	980	1163	79
J424		Zone 1	1	979	1163	80
J426		Zone 1	0	981	1163	79
J428		Zone 1	0	982	1163	78
J430		Zone 1	3	983	1163	78
J432		Zone 1	23	980	1163	79
J434		Zone 1	0	980	1163	79
J436		Zone 1	0	981	1163	79
J438		Zone 1	0	977	1163	81
J44		Gila River Zone	0	930	1100	73
J440	47	Zone 1	1	983	1163	78
J442		Zone 1	1	985	1163	77
J444		Zone 1	0	989	1163	75
J446		Zone 1	0	984	1163	78
J448		Zone 1	3	988	1163	76

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J450		Zone 1	3	987	1163	76
J452		Zone 1	3	985	1163	77
J454		Zone 1	2	983	1163	78
J456		Zone 1	3	987	1163	76
J458		Zone 1	2	984	1163	78
J46		Gila River Zone	0	930	1100	73
J460		Zone 1	1	990	1163	75
J462		Zone 1	0	992	1163	74
J464		Zone 1	0	993	1163	74
J468		Zone 1	0	994	1163	73
J470		Zone 1	0	995	1163	73
J472		Zone 1	0	994	1163	73
J474		Zone 1	0	993	1163	74
J476		Zone 1	1	993	1163	74
J48		Gila River Zone	0	926	1100	75
J480		Zone 1	3	992	1163	74
J482		Zone 1	2	993	1163	74
J484		Zone 1	4	992	1163	74
J486		Zone 1	4	990	1163	75
J488		Zone 1	0	990	1163	75
J490		Zone 1	3	986	1163	77
J492		Zone 1	5	989	1163	75
J494		Zone 1	3	987	1163	76
J496		Zone 1	3	986	1163	77
J498		Zone 1	3	984	1163	78
J50		Gila River Zone	0	929	1100	74
J502		Zone 1	1	988	1163	76
J506		Zone 1	0	938	1163	97
J52		Gila River Zone	0	930	1100	73
J54		Gila River Zone	0	928	1100	74
J60		Gila River Zone	0	929	1100	74

**Average Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J64		Gila River Zone	0	929	1100	74
J66		Gila River Zone	0	940	1100	69
J68		Gila River Zone	0	939	1100	70
J690		Gila River Zone	0	937	1100	70
J692		Gila River Zone	0	929	1100	74
J70		Gila River Zone	0	934	1100	72
J72		Gila River Zone	0	934	1100	72
J78		Gila River Zone	0	937	1100	70
J80		Gila River Zone	0	936	1100	71
J82		Gila River Zone	0	934	1100	72
J84		Gila River Zone	0	932	1100	73
J88		Gila River Zone	0	936	1100	71
J90		Gila River Zone	0	938	1100	70
J92		Gila River Zone	0	934	1100	72
J94		Gila River Zone	0	935	1100	71
J96		Gila River Zone	0	935	1100	71
J98		Gila River Zone	0	937	1100	70

Maximum Day Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
101	Zone 1	22676	22836	1,294	16	140	718	1.15	0.38	0.29
103	Gila River Zone	22678	J34	1,290	16	120	310	0.5	0.11	0.08
105	Gila River Zone	22680	22682	2,663	16	125	-186	0.3	0.08	0.03
109	Gila River Zone	22684	J22	818	12	120	-6	0.02	0	0
111	Gila River Zone	22686	J10	1,112	12	120	91	0.26	0.04	0.03
113	Gila River Zone	22682	J3174	2,642	16	125	671	1.07	0.85	0.32
117	Gila River Zone	22690	22692	1,460	12	120	4	0.01	0	0
119	Gila River Zone	22692	22694	1,640	12	120	-55	0.16	0.02	0.01
121	Gila River Zone	22694	22696	1,179	12	120	-81	0.23	0.03	0.03
123	Gila River Zone	22696	19302	792	12	120	-231	0.66	0.15	0.2
1585	Zone 1	23518	22816	2,393	12	120	-293	0.83	0.7	0.3
1593	Zone 1	22698	22842	2,701	12	120	638	1.81	3.46	1.28
1597	Zone 1	23520	22676	2,604	12	120	-448	1.27	1.73	0.67
15FCCF	Gila River Zone	7136	7138	9	16	125	0	0	0	0
1603	Zone 1	23522	22672	1,412	24	140	3049	2.16	0.84	0.6
1605	Zone 1	23524	J418	413	12	120	-217	0.62	0.07	0.17
1609	Zone 1	23526	J432	413	12	120	-140	0.4	0.03	0.08
20408A	Zone 1	6748	18488	801	6	100	5	0.06	0.01	0.01
2331	Gila River Zone	9874	10982	552	24	130	-711	0.5	0.03	0.05
2421	Gila River Zone	22684	J3180	1,279	12	120	-159	0.45	0.12	0.1
2429	Gila River Zone	23998	22682	1,994	16	120	258	0.41	0.12	0.06
2431	Gila River Zone	23998	10982	1,979	16	120	-258	0.41	0.12	0.06
2601	Zone 1	24070	24072	1,526	12	120	-38	0.11	0.01	0.01
2605	Zone 1	24072	3290	3,858	12	120	-38	0.11	0.03	0.01
275	Zone 1	3290	22648	1,465	24	130	-38	0.03	0	0
277	Zone 1	22698	23522	1,231	24	140	3049	2.16	0.73	0.6
279	Zone 1	22670	22672	1,328	12	125	-489	1.39	0.96	0.72
27E5D8	Gila River Zone	19294	19302	1,686	16	125	711	1.14	0.6	0.36
281	Zone 1	20020	22672	2,647	16	125	-1285	2.05	2.83	1.07
293	Zone 1	22674	J3214	1,189	12	120	523	1.48	1.05	0.89
295	Gila River Zone	22684	22818	1,316	12	120	165	0.47	0.14	0.1
299	Gila River Zone	22826	22828	5,264	12	120	-31	0.09	0.02	0
29F2B7	Zone 1	20028	22810	1,388	24	130	0	0	0	0
2B2A5	Zone 1	20482	22850	1,228	24	125	0	0	0	0
2B539	Zone 1	19990	20090	172	8	110	95	0.61	0.05	0.32
2B5CF	Zone 1	18542	18796	191	8	110	-53	0.34	0.02	0.11
2B5D2	Zone 1	18796	6748	170	8	110	28	0.18	0.01	0.03
2B5EF	Zone 1	18796	20350	839	24	130	-1013	0.72	0.07	0.09
2B624	Zone 1	20350	18610	170	8	110	31	0.2	0.01	0.04
2B627	Zone 1	18666	20350	189	8	110	-56	0.36	0.02	0.12
2B62A	Zone 1	20350	20004	700	24	130	-1104	0.78	0.07	0.1
2B64A	Zone 1	20344	20004	154	6	100	0	0	0	0
2B6A2	Zone 1	19990	20014	861	24	130	-1351	0.96	0.13	0.15
2B6A5	Zone 1	20014	20028	499	24	130	-1499	1.06	0.09	0.18
2B6CA	Zone 1	20326	20014	70	8	110	-129	0.83	0.04	0.57
2B7B6	Zone 1	20260	20290	549	6	100	-67	0.75	0.44	0.8
2B7CE	Zone 1	20274	20290	547	6	100	-57	0.64	0.32	0.59
2B7D4	Zone 1	20290	20326	117	8	110	-125	0.8	0.06	0.53
2B7E9	Zone 1	20264	20286	439	6	100	27	0.3	0.07	0.15
2B7EC	Zone 1	20286	20256	611	6	100	-1	0.02	0	0
2BB61	Zone 1	20264	20274	440	6	100	-9	0.1	0.01	0.02
2BBA9	Zone 1	20286	20260	881	6	100	14	0.16	0.04	0.05
2BBBBB	Zone 1	20274	20256	269	6	100	37	0.42	0.07	0.27
2BBF9	Zone 1	20256	20260	269	6	100	27	0.31	0.04	0.15
2BC66	Zone 1	70	20038	170	6	100	6	0.07	0	0.01
2BC6C	Zone 1	20038	20264	269	6	100	26	0.29	0.04	0.14
2BC6F	Zone 1	70	20060	1,169	6	100	-18	0.21	0.09	0.07
2BC7E	Zone 1	20060	18828	680	6	100	-19	0.21	0.05	0.07
2BC8B	Zone 1	20030	19990	186	8	110	-124	0.79	0.1	0.52
2BC91	Zone 1	20038	20030	891	6	100	-31	0.35	0.17	0.19
2BC97	Zone 1	20060	20222	353	8	110	-36	0.23	0.02	0.05
2BC9D	Zone 1	20050	20222	307	8	110	43	0.27	0.02	0.07
2BCA0	Zone 1	20222	20050	562	6	100	-13	0.15	0.02	0.04
2BCAC	Zone 1	20030	20050	258	8	110	64	0.41	0.04	0.15
2C1AC	Zone 1	18594	20034	270	8	110	-48	0.3	0.02	0.09
2C1B2	Zone 1	20034	20118	611	8	110	-29	0.18	0.02	0.04

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
2C1C4	Zone 1	20086	20176	626	6	100	-13	0.15	0.03	0.04
2C1CE	Zone 1	20176	18818	233	6	100	0	0	0	0
2C1D7	Zone 1	18818	20086	426	6	100	16	0.18	0.03	0.06
2C1BF	Zone 1	20104	20118	360	6	100	-11	0.12	0.01	0.03
2C210	Zone 1	20090	20104	1,282	6	100	15	0.17	0.06	0.05
2C21D	Zone 1	20014	20076	171	8	110	15	0.09	0	0.01
2C220	Zone 1	20156	20076	459	8	110	-12	0.07	0	0.01
2C223	Zone 1	20076	20158	422	8	110	3	0.02	0	0
2CSD8	Zone 1	20006	18818	172	6	100	21	0.23	0.02	0.09
2C91E	Zone 1	20090	20118	449	8	110	55	0.35	0.05	0.12
2C924	Zone 1	20104	20034	1,006	6	100	7	0.08	0.01	0.01
2C930	Zone 1	20176	20090	270	6	100	-18	0.21	0.02	0.07
2C937	Zone 1	20086	20034	270	6	100	23	0.26	0.03	0.11
2C95A	Zone 1	20052	20030	234	6	100	-22	0.25	0.02	0.11
2C9A6	Zone 1	20004	20006	192	24	130	-1106	0.78	0.02	0.1
2C9BB	Zone 1	19990	20006	539	24	130	1129	0.8	0.06	0.11
2FE88	Gila River Zone	22864	7138	536	16	125	-352	0.56	0.05	0.1
2FF4	Gila River Zone	7138	19302	2,608	16	125	-352	0.56	0.25	0.1
301	Gila River Zone	22828	22830	849	12	120	-138	0.39	0.06	0.07
303	Gila River Zone	22830	22824	2,392	24	120	-328	0.23	0.03	0.01
305	Gila River Zone	22688	22820	1,511	16	125	269	0.43	0.09	0.06
307	Gila River Zone	22820	22828	3,294	12	120	83	0.24	0.1	0.03
311	Gila River Zone	22822	13160	818	12	120	151	0.43	0.07	0.09
313	Gila River Zone	22822	22696	1,655	12	120	-103	0.29	0.07	0.04
315	Gila River Zone	22818	22834	2,599	24	125	-90	0.06	0	0
317	Gila River Zone	22834	22820	2,599	24	130	40	0.03	0	0
319	Gila River Zone	22834	710	1,433	12	120	-130	0.37	0.1	0.07
321	Gila River Zone	22824	22832	1,628	12	120	-62	0.18	0.03	0.02
323	Zone 1	22836	13208	982	16	140	141	0.22	0.01	0.01
32324	Zone 1	18796	13202	840	24	130	928	0.66	0.06	0.08
327	Zone 1	22836	22838	1,602	12	120	345	0.98	0.66	0.41
329	Zone 1	22838	13186	976	12	120	218	0.62	0.17	0.17
331	Zone 1	22664	22842	2,517	12	120	-260	0.74	0.61	0.24
335	Zone 1	22816	22652	366	12	120	-293	0.83	0.11	0.3
343	Zone 1	22850	1506	1,304	24	130	0	0	0	0
353	Gila River Zone	22824	22854	2,889	24	125	-331	0.23	0.03	0.01
35ACD	Zone 1	9738	18666	261	8	110	-23	0.15	0.01	0.02
35B3D	Zone 1	20060	9744	269	8	110	20	0.13	0	0.02
3.50B+90	Zone 1	18666	9744	954	6	100	6	0.06	0.01	0.01
35F26	Zone 1	9738	9732	567	6	100	3	0.04	0	0
35FF8	Zone 1	18610	18632	466	8	110	4	0.03	0	0
36080	Zone 1	18630	18632	532	6	100	1	0.01	0	0
36095	Zone 1	18630	18594	337	8	110	-19	0.12	0.01	0.02
3.61E+04	Zone 1	18632	18630	301	8	110	-3	0.02	0	0
361FD	Zone 1	9718	9710	662	6	100	2	0.02	0	0
3.62E+02	Zone 1	18594	9718	270	6	100	9	0.1	0.01	0.02
36497	Zone 1	18610	10716	931	6	100	16	0.18	0.05	0.06
364F9	Zone 1	10716	9690	270	6	100	18	0.21	0.02	0.07
366FB	Zone 1	9702	18530	310	6	100	-5	0.05	0	0.01
36879	Zone 1	11034	10720	269	6	100	1	0.01	0	0
3.68E+09	Zone 1	11034	18542	691	6	100	-11	0.13	0.02	0.03
36919	Zone 1	18542	9702	600	6	100	11	0.13	0.02	0.03
36956	Zone 1	11034	18536	749	6	100	2	0.02	0	0
36959	Zone 1	18536	18530	439	6	100	-8	0.09	0.01	0.01
36990	Zone 1	10720	18536	480	6	100	3	0.03	0	0
36AD9	Zone 1	9726	18530	269	6	100	18	0.21	0.02	0.07
36AFA	Zone 1	6748	9690	786	6	100	-1	0.01	0	0
36BCF	Zone 1	9690	18488	587	6	100	7	0.07	0.01	0.01
3.91E+10	Zone 1	70	66	178	6	100	4	0.05	0	0.01
395	Gila River Zone	22864	22854	256	30	130	352	0.16	0	0
411	Zone 1	22876	23518	2,595	12	120	38	0.11	0.02	0.01
4.13E+02	Zone 1	22876	24070	5,276	12	120	-38	0.11	0.04	0.01
4E98B	Gila River Zone	13444	13440	93	20	130	0	0	0	0
4E991	Gila River Zone	13440	9876	66	20	130	0	0	0	0
50CFA	Gila River Zone	9876	12866	562	16	125	711	1.14	0.2	0.36
50CFB	Gila River Zone	19294	12866	382	16	125	-711	1.14	0.14	0.36

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
593	Zone 1	20052	18828	57	6	100	20	0.23	0	0.09
69	Zone 1	20028	23524	1,486	12	120	-217	0.62	0.26	0.17
71	Zone 1	22648	33166	288	24	130	98	0.07	0	0
73	Zone 1	22652	22650	2,698	12	120	273	0.77	0.72	0.27
75	Zone 1	22652	33164	2,218	12	120	-751	2.13	3.83	1.73
77	Zone 1	22652	22656	2,296	12	120	13	0.04	0	0
79	Zone 1	22656	22658	394	12	120	-11	0.03	0	0
83	Zone 1	22660	22662	987	12	120	148	0.42	0.08	0.09
85	Zone 1	22654	22662	1,480	12	120	-104	0.29	0.07	0.04
87	Zone 1	22654	22664	1,100	12	120	60	0.17	0.02	0.02
89	Zone 1	22664	22666	2,616	12	120	214	0.61	0.44	0.17
8B1A3	Zone 1	9710	18610	270	6	100	-2	0.03	0	0
8B1B5	Zone 1	9726	18666	903	6	100	-19	0.21	0.07	0.08
8B397	Zone 1	10720	9702	269	6	100	-7	0.08	0	0.01
8B39A	Zone 1	10716	18594	1,422	6	100	-13	0.15	0.06	0.04
8C9E0	Gila River Zone	9874	9876	14	24	130	711	0.5	0	0.05
8CA72	Zone 1	20020	20028	1,309	24	130	1283	0.91	0.18	0.14
8CB0B	Zone 1	9744	9726	1,339	6	100	14	0.16	0.06	0.05
8CB0E	Zone 1	9744	9732	348	8	110	-2	0.01	0	0
8CB14	Zone 1	9732	9738	281	8	110	-11	0.07	0	0.01
8CB29	Zone 1	9710	9718	656	6	100	-2	0.02	0	0
8CB54	Zone 1	6748	18488	1,299	6	100	4	0.05	0.01	0
91	Zone 1	22666	22668	2,538	12	120	-339	0.96	1.01	0.4
93	Zone 1	22668	22670	1,341	12	125	-489	1.39	0.97	0.72
95	Zone 1	22666	22674	2,634	12	120	419	1.19	1.55	0.59
97	Zone 1	22674	23520	2,678	12	120	-256	0.73	0.63	0.24
99	Zone 1	22672	22676	2,628	16	140	1238	1.98	2.12	0.81
P101	Gila River Zone	J88	J80	325	8	100	-11	0.07	0	0.01
P103	Gila River Zone	J90	J94	298	8	100	11	0.07	0	0.01
P105	Gila River Zone	J88	J90	954	8	100	6	0.04	0	0
P107	Gila River Zone	J92	J72	292	8	100	-13	0.09	0	0.01
P109	Gila River Zone	J94	J70	273	8	100	11	0.07	0	0.01
P11	Gila River Zone	J10	22688	2,594	12	120	23	0.07	0.01	0
P111	Gila River Zone	J92	J94	973	8	100	0	0	0	0
P113	Gila River Zone	J96	J690	1,028	8	100	-19	0.12	0.02	0.02
P115	Gila River Zone	J96	J98	295	8	100	-15	0.1	0	0.01
P117	Gila River Zone	J100	J98	803	8	100	15	0.1	0.01	0.01
P119	Gila River Zone	J102	J100	2,012	8	100	4	0.03	0	0
P121	Gila River Zone	J100	J102	326	8	100	-11	0.07	0	0.01
P123	Gila River Zone	J104	J692	1,241	8	100	12	0.07	0.01	0.01
P125	Gila River Zone	J104	J106	295	8	100	-12	0.07	0	0.01
P127	Gila River Zone	J108	J112	296	8	100	12	0.07	0	0.01
P129	Gila River Zone	J110	J116	751	8	100	-16	0.1	0.01	0.01
P13	Gila River Zone	J12	J3220	692	8	120	97	0.62	0.2	0.28
P131	Gila River Zone	J108	J110	247	8	100	6	0.04	0	0
P133	Gila River Zone	J112	J106	299	8	100	12	0.07	0	0.01
P135	Gila River Zone	J112	J114	352	8	100	0	0	0	0
P137	Gila River Zone	J116	J108	542	8	100	18	0.12	0.01	0.02
P139	Gila River Zone	J116	J120	222	8	100	-34	0.22	0.01	0.06
P141	Gila River Zone	J118	22678	1,447	12	120	-308	0.87	0.48	0.33
P143	Gila River Zone	J120	J96	354	8	100	-34	0.21	0.02	0.06
P145	Gila River Zone	J118	J120	179	8	100	0	0	0	0
P15	Gila River Zone	J14	J28	717	6	100	0	0.01	0	0
P1673	Gila River Zone	J3160	22832	1,828	12	120	40	0.11	0.01	0.01
P1675	Gila River Zone	22820	J3160	3,184	12	120	-51	0.15	0.04	0.01
P1677	Trans	22854	22832	2,761	12	120	22	0.06	0.01	0
P1679	Gila River Zone	J10	22680	3,887	12	120	-253	0.72	0.89	0.23
P1681	Zone 1	22842	J3182	2,240	12	120	222	0.63	0.41	0.18
P1683	Zone 1	J3164	22698	424	24	120	-776	0.55	0.03	0.06
P1685	Zone 1	J3166	22650	839	24	130	-164	0.12	0	0
P1687	Zone 1	J3166	J3170	990	12	120	189	0.53	0.13	0.13
P1689	Zone 1	J3168	J3184	1,530	12	120	-24	0.07	0	0
P1691	Zone 1	J3170	J3168	1,670	12	120	115	0.33	0.09	0.05
P1693	Gila River Zone	J3172	22690	666	12	120	4	0.01	0	0
P1695	Gila River Zone	J3174	22688	1,070	16	125	404	0.64	0.13	0.13
P1697	Gila River Zone	J3172	J3174	1,059	12	100	-127	0.36	0.1	0.09

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P1699	Gila River Zone	J3176	22826	2,161	12	120	65	0.18	0.04	0.02
P17	Gila River Zone	J18	J16	882	6	100	0	0	0	0
P1701	Gila River Zone	J3180	J118	1,247	12	120	-308	0.87	0.41	0.33
P1703	Zone 1	J3182	22658	174	12	120	30	0.08	0	0
P1705	Zone 1	22660	J3182	435	12	120	-148	0.42	0.04	0.09
P1707	Zone 1	J3184	23518	1,989	12	120	-126	0.36	0.13	0.06
P1711	Gila River Zone	J3176	22818	341	12	120	-255	0.72	0.08	0.23
P1715	Zone 1	22698	J430	3,296	12	120	602	1.71	3.79	1.15
P1727	Zone 1	J3202	J3222	809	24	130	1051	0.75	0.08	0.1
P1729	Zone 1	J3186	J3202	1,983	12	120	155	0.44	0.18	0.09
P1731	Zone 1	J3204	V8000	242	12	120	668	1.9	0.34	1.39
P1733	Zone 1	J3208	V8002	216	16	140	0	0	0	0
P1735	Zone 1	J3204	J3206	2,639	8	120	-184	1.17	2.42	0.92
P1737	Zone 1	J3206	23520	2,281	8	120	-43	0.27	0.14	0.06
P1739	Zone 1	J3206	J3208	2,639	8	120	-141	0.9	1.48	0.56
P1741	Gila River Zone	J3172	22822	1,567	12	120	48	0.14	0.02	0.01
P1743	Zone 1	J506	V8006	94	8	120	0	0	0	0
P1745	Gila River Zone	J3212	J3210	2,444	8	120	0	0	0	0
P1747	Gila River Zone	19302	J3210	1,563	8	120	0	0	0	0
P1749	Zone 1	RES9006	22698	551	24	120	5103	3.62	1.13	2.06
P1751	Gila River Zone	RES9008	22682	8,488	24	120	718	0.51	0.46	0.05
P1753	Zone 1	V8000	22678	115	12	120	668	1.9	0.16	1.39
P1755	Zone 1	V8002	22682	223	16	140	0	0	0	0
P1757	Zone 1	V8004	10982	93	24	130	1051	0.75	0.01	0.1
P1759	Zone 1	J3214	J3204	1,149	12	120	484	1.37	0.88	0.77
P1761	Gila River Zone	J3216	J14	294	6	100	0	0.01	0	0
P1763	Gila River Zone	J3218	J20	248	6	100	0	0	0	0
P1765	Gila River Zone	J3220	22686	382	8	120	97	0.62	0.11	0.28
P1769	Zone 1	J3222	V8004	28	24	130	1051	0.75	0	0.09
P1771	Zone 1	J3222	20482	130	24	125	0	0	0	0
P1773	Gila River Zone	V8006	J3212	132	8	120	0	0	0	0
P19	Gila River Zone	J18	J3218	580	6	100	0	0	0	0
P21	Gila River Zone	J20	J26	297	6	100	0	0	0	0
P23	Gila River Zone	J22	22686	945	12	120	-6	0.02	0	0
P25	Gila River Zone	J24	J3216	332	6	100	0	0	0	0
P27	Gila River Zone	J22	J24	182	6	100	0	0	0	0
P29	Gila River Zone	J26	J24	327	6	100	0	0	0	0
P31	Gila River Zone	J28	J16	297	6	100	0	0	0	0
P33	Gila River Zone	J28	J32	930	6	100	0	0	0	0
P35	Gila River Zone	J32	J26	443	6	100	0	0	0	0
P37	Gila River Zone	J32	J3216	877	6	100	0	0	0	0
P39	Gila River Zone	J34	22680	1,317	16	120	213	0.34	0.05	0.04
P41	Gila River Zone	J34	J78	821	8	100	97	0.62	0.32	0.4
P43	Gila River Zone	J38	J84	331	6	100	-12	0.14	0.01	0.04
P45	Gila River Zone	J36	J44	285	6	100	12	0.14	0.01	0.03
P47	Gila River Zone	J38	J46	285	6	100	12	0.14	0.01	0.04
P49	Gila River Zone	J40	J48	626	6	100	-8	0.09	0.01	0.01
P501	Zone 1	J418	23526	675	12	120	-140	0.4	0.05	0.08
P503	Zone 1	J418	J420	204	8	120	-78	0.5	0.04	0.19
P505	Zone 1	J420	J422	1,044	8	120	-57	0.37	0.11	0.11
P507	Zone 1	J422	J424	310	8	120	28	0.18	0.01	0.03
P509	Zone 1	J424	J420	1,080	6	120	25	0.29	0.1	0.09
P51	Gila River Zone	J44	J60	256	6	100	17	0.19	0.02	0.06
P511	Zone 1	J422	J426	272	8	120	-90	0.58	0.07	0.25
P513	Zone 1	J426	J428	280	8	120	-116	0.74	0.11	0.39
P515	Zone 1	J428	J430	174	8	120	-168	1.07	0.13	0.77
P517	Zone 1	J432	J440	422	12	120	-101	0.29	0.02	0.04
P519	Zone 1	J432	J434	184	12	100	-77	0.22	0.01	0.04
P521	Zone 1	J434	J428	665	6	120	-51	0.58	0.24	0.35
P523	Zone 1	J436	J434	240	12	100	0	0	0	0
P525	Zone 1	J434	J438	356	6	120	-26	0.29	0.03	0.1
P527	Zone 1	J438	J426	930	6	120	-26	0.29	0.09	0.1
P529	Zone 1	J440	J458	291	12	120	261	0.74	0.07	0.24
P53	Gila River Zone	J46	J50	290	6	100	7	0.08	0	0.01
P531	Zone 1	J430	J440	584	12	120	429	1.22	0.36	0.61
P533	Zone 1	J442	J490	185	12	120	202	0.57	0.03	0.15

**Maximum Day Demand
Pipe Data
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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P535	Zone 1	J444	J460	531	12	120	222	0.63	0.1	0.18
P537	Zone 1	J444	J448	216	8	120	-68	0.43	0.03	0.14
P539	Zone 1	J448	J450	302	8	120	-70	0.44	0.05	0.15
P541	Zone 1	J450	J452	339	8	120	-55	0.35	0.03	0.1
P543	Zone 1	J452	J446	347	8	120	-39	0.25	0.02	0.05
P545	Zone 1	J446	J454	614	8	120	-39	0.25	0.03	0.05
P547	Zone 1	J454	J452	681	6	120	22	0.25	0.05	0.07
P549	Zone 1	J454	J440	191	8	120	-65	0.41	0.03	0.13
P55	Gila River Zone	J44	J52	279	6	100	-5	0.05	0	0.01
P551	Zone 1	J442	J450	596	8	120	19	0.12	0.01	0.01
P553	Zone 1	J456	J502	98	12	120	201	0.57	0.01	0.15
P555	Zone 1	J456	J448	312	8	120	3	0.02	0	0
P557	Zone 1	J458	J442	163	12	120	223	0.63	0.03	0.18
P559	Zone 1	J460	J462	346	12	120	209	0.59	0.06	0.16
P561	Zone 1	J462	J464	303	12	120	194	0.55	0.04	0.14
P563	Zone 1	J464	22648	251	12	120	238	0.67	0.05	0.21
P565	Zone 1	J464	J468	431	8	120	-44	0.28	0.03	0.06
P567	Zone 1	J468	J470	606	6	120	-12	0.14	0.01	0.02
P569	Zone 1	J470	J472	277	6	120	-12	0.14	0.01	0.02
P57	Gila River Zone	J48	J42	279	6	100	-4	0.04	0	0
P571	Zone 1	J472	J474	289	6	120	-12	0.14	0.01	0.02
P573	Zone 1	J474	J476	317	6	120	19	0.22	0.02	0.06
P577	Zone 1	J476	J462	413	8	120	-15	0.1	0	0.01
P579	Zone 1	J460	J480	637	8	120	11	0.07	0	0.01
P581	Zone 1	J480	J482	260	8	120	-25	0.16	0.01	0.02
P583	Zone 1	J482	J484	261	8	120	-29	0.19	0.01	0.03
P585	Zone 1	J484	J486	538	8	120	-36	0.23	0.02	0.05
P589	Zone 1	J486	J488	249	8	120	1	0	0	0
P59	Gila River Zone	J50	J42	507	6	100	4	0.04	0	0
P591	Zone 1	J490	J456	160	12	120	208	0.59	0.03	0.16
P593	Zone 1	J490	J492	685	6	120	-12	0.13	0.02	0.02
P595	Zone 1	J492	J494	340	6	120	-20	0.22	0.02	0.06
P597	Zone 1	J494	J496	329	8	120	-13	0.08	0	0.01
P599	Zone 1	J496	J498	950	8	120	-19	0.12	0.01	0.01
P601	Zone 1	J498	J458	166	8	120	-35	0.22	0.01	0.04
P605	Zone 1	J494	J498	713	6	120	-11	0.13	0.02	0.02
P607	Zone 1	J502	J444	178	12	120	154	0.44	0.02	0.09
P609	Zone 1	J486	J502	1,150	8	120	-45	0.29	0.08	0.07
P61	Gila River Zone	J48	J54	302	6	100	-4	0.05	0	0
P611	Zone 1	J480	J474	278	6	120	31	0.35	0.04	0.14
P613	Zone 1	J476	J468	306	8	120	32	0.2	0.01	0.04
P63	Gila River Zone	J52	J46	615	6	100	-5	0.06	0	0.01
P65	Gila River Zone	J54	J50	462	6	100	-3	0.04	0	0
P67	Gila River Zone	J52	J54	749	6	100	1	0.01	0	0
P71	Gila River Zone	J60	J40	524	6	100	-8	0.09	0.01	0.01
P75	Gila River Zone	J64	J12	457	8	100	97	0.62	0.18	0.4
P77	Gila River Zone	J64	J60	194	6	100	-24	0.28	0.02	0.12
P79	Gila River Zone	J66	J68	876	8	100	5	0.03	0	0
P81	Gila River Zone	J68	J90	289	8	100	5	0.03	0	0
P83	Gila River Zone	J70	J82	335	8	100	11	0.07	0	0.01
P831	Gila River Zone	J690	J102	258	8	100	15	0.1	0	0.01
P833	Gila River Zone	J690	J78	197	8	110	-34	0.21	0.01	0.05
P835	Gila River Zone	J692	J110	638	8	100	-22	0.14	0.02	0.03
P837	Gila River Zone	J692	J64	203	8	100	34	0.22	0.01	0.06
P87	Gila River Zone	J66	J88	265	8	100	-5	0.03	0	0
P89	Gila River Zone	J78	J64	1,325	8	100	39	0.25	0.1	0.07
P91	Gila River Zone	J80	J72	337	8	100	13	0.09	0	0.01
P93	Gila River Zone	J78	J80	199	8	100	24	0.16	0.01	0.03
P95	Gila River Zone	J82	J92	370	8	100	-14	0.09	0	0.01
P97	Gila River Zone	J84	J36	552	6	100	12	0.14	0.02	0.03
P99	Gila River Zone	J82	J84	447	8	100	24	0.16	0.01	0.03

**Maximum Day Demand
Junction Data
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Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Static Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
10716		Zone 1	11	955	1159	88	1,511	57	22876
10720		Zone 1	6	958	1159	87	1,506	57	22876
10982	45	Gila River Zone	82	944	1100	67	3,082	56	22876
11034		Zone 1	8	956	1159	88	1,508	57	22876
12866		Gila River Zone	0	937	1100	71	3,000	56	22876
13440		Gila River Zone	0	938	1100	70	1,500	57	22876
18488		Zone 1	16	951	1159	90	1,516	57	22876
18530		Zone 1	6	961	1159	86	1,506	57	22876
18536		Zone 1	12	961	1159	86	1,512	57	22876
18542		Zone 1	30	956	1159	88	1,530	57	22876
18594		Zone 1	6	959	1159	87	1,506	57	22876
18610		Zone 1	8	959	1159	87	1,508	57	22876
18630		Zone 1	15	963	1159	84	1,515	57	22876
18632		Zone 1	9	957	1159	87	1,509	57	22876
18666		Zone 1	9	961	1159	86	1,509	57	22876
18796		Zone 1	4	955	1159	88	1,504	57	22876
18818		Zone 1	4	955	1159	88	1,504	57	22876
18828		Zone 1	1	975	1159	80	1,501	57	22876
19294		Gila River Zone	0	925	1099	76	3,000	56	22876
19302	44	Gila River Zone	128	935	1099	71	1,628	57	22876
19990		Zone 1	4	966	1159	84	1,504	57	22876
20004		Zone 1	2	955	1159	88	1,502	57	22876
20006		Zone 1	2	964	1159	85	1,502	57	22876
20014		Zone 1	3	969	1159	82	1,503	57	22876
20020		Zone 1	2	975	1159	80	1,502	57	22876
20028	46	Zone 1	1	971	1159	82	1,501	57	22876
20030		Zone 1	7	967	1159	83	1,507	57	22876
20034		Zone 1	11	960	1159	86	1,511	57	22876
20038		Zone 1	11	971	1159	82	1,511	57	22876
20050		Zone 1	8	968	1159	83	1,508	57	22876
20052		Zone 1	2	966	1159	84	1,502	57	22876
20060		Zone 1	16	967	1159	83	1,516	57	22876
20076		Zone 1	0	968	1159	83	1,500	57	22876
20086		Zone 1	7	961	1159	86	1,507	57	22876
20090		Zone 1	7	965	1159	84	1,507	57	22876
20104		Zone 1	18	963	1159	85	1,518	57	22876
20118		Zone 1	16	964	1159	85	1,516	57	22876
20156		Zone 1	12	966	1159	84	1,512	57	22876
20158		Zone 1	3	969	1159	83	1,503	57	22876
20176		Zone 1	5	964	1159	84	1,505	57	22876
20222		Zone 1	20	968	1159	83	1,520	57	22876
20256		Zone 1	9	971	1159	81	1,509	57	22876
20260		Zone 1	108	972	1159	81	1,608	57	22876
20264		Zone 1	8	969	1159	82	1,508	57	22876
20274		Zone 1	11	970	1159	82	1,511	57	22876
20286		Zone 1	14	973	1159	80	1,514	57	20286
20290		Zone 1	2	970	1159	82	1,502	57	22876
20326		Zone 1	4	969	1159	82	1,504	57	22876
20344		Zone 1	0	963	1159	85	1,500	57	22876
20350		Zone 1	4	960	1159	86	1,504	57	22876
20482		Zone 1	0	944	1159	93	3,000	56	22876
22648	48	Zone 1	102	1005	1159	67	3,102	49	22876
22650	20	Zone 1	109	998	1159	70	3,109	49	22876
22652	15	Zone 1	172	1000	1160	69	3,172	51	22876

**Maximum Day Demand
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Static Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
22654	9	Zone 1	44	1003	1160	68	3,044	55	22654
22656	14	Zone 1	24	1003	1160	68	3,024	54	22876
22658	13	Zone 1	19	1004	1160	68	3,019	54	22876
22660	11	Zone 1	0	1003	1160	68	3,000	54	22876
22662	10	Zone 1	44	1003	1160	68	3,044	55	22876
22664	8	Zone 1	105	996	1160	71	1,605	57	22876
22666	7	Zone 1	134	980	1159	78	3,134	56	22876
22668	24	Zone 1	150	974	1160	81	3,150	56	22876
22670		Zone 1	0	965	1161	85	1,500	57	22876
22672	25	Zone 1	37	985	1162	77	3,037	57	22876
22674	6	Zone 1	151	963	1158	84	3,151	56	22876
22676	26	Zone 1	71	958	1160	88	3,071	56	22876
22678	5	Gila River Zone	50	945	1100	67	1,550	57	22876
22680	27	Gila River Zone	147	944	1099	68	1,647	57	22876
22682	31	Gila River Zone	119	940	1100	69	3,119	56	22876
22684		Gila River Zone	0	927	1099	74	1,500	57	22876
22686		Gila River Zone	0	925	1099	75	1,500	57	22876
22688	38	Gila River Zone	158	915	1099	80	3,158	56	22876
22690		Gila River Zone	0	926	1099	75	1,500	57	22876
22692	35	Gila River Zone	60	944	1099	67	1,560	57	22876
22694	36	Gila River Zone	26	935	1099	71	1,526	57	22876
22696	40	Gila River Zone	48	928	1099	74	1,548	57	22876
22698	22	Zone 1	37	989	1164	76	3,037	57	22876
22810	50	Zone 1	0	967	1159	83	1,500	57	22876
22816		Zone 1	0	1005	1160	67	3,000	50	22876
22818	3	Gila River Zone	0	910	1098	82	3,000	56	22876
22820	41	Gila River Zone	277	905	1098	84	3,277	56	22876
22822		Gila River Zone	0	930	1099	73	1,500	57	22876
22824	53	Gila River Zone	65	895	1098	88	3,065	56	22876
22826	1	Gila River Zone	95	896	1098	88	3,095	56	22876
22828	51	Gila River Zone	190	905	1098	84	3,190	56	22876
22830	52	Gila River Zone	190	905	1098	84	3,190	56	22876
22832	42	Gila River Zone	0	905	1098	84	3,000	56	22876
22834		Gila River Zone	0	912	1098	81	3,000	56	22876
22836	28	Zone 1	232	955	1160	89	1,732	57	22876
22838	29	Zone 1	128	965	1159	84	1,628	57	22876
22842	23	Zone 1	156	995	1160	72	3,156	55	22876
22850		Zone 1	0	939	1159	95	3,000	56	22876
22854	43	Gila River Zone	0	910	1099	82	3,000	56	22876
22864		Gila River Zone	0	911	1099	81	3,000	56	22876
22876		Zone 1	0	1025	1159	58	3,000	34	22876
23518	16	Zone 1	206	1015	1159	62	3,206	44	22876
23520	26.1	Zone 1	150	959	1158	87	3,150	56	22876
23522		Zone 1	0	983	1163	78	3,000	57	22876
23524		Zone 1	0	975	1160	80	1,500	56	22876
23526		Zone 1	0	980	1160	78	1,500	56	22876
23998	32	Gila River Zone	0	952	1100	64	1,500	57	22876
24070		Zone 1	0	1019	1159	61	3,000	33	24070
24072		Zone 1	0	1014	1159	63	3,000	38	24072
3290	49	Zone 1	0	992	1159	72	3,000	49	22876
66		Zone 1	4	972	1159	81	1,504	38	66
6748		Zone 1	20	954	1159	89	1,520	57	22876
70		Zone 1	8	971	1159	81	1,508	57	22876
7136		Gila River Zone	0	914	1099	80	3,000	56	22876

**Maximum Day Demand
Junction Data
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Static Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
7138		Gila River Zone	0	914	1099	80	1,500	57	22876
9690		Zone 1	10	954	1159	89	1,510	57	22876
9702		Zone 1	9	959	1159	86	1,509	57	22876
9710		Zone 1	6	960	1159	86	1,506	57	22876
9718		Zone 1	5	960	1159	86	1,505	57	22876
9726		Zone 1	15	962	1159	85	1,515	57	22876
9732		Zone 1	12	964	1159	84	1,512	57	22876
9738		Zone 1	9	962	1159	85	1,509	57	22876
9744		Zone 1	13	966	1159	84	1,513	57	22876
9874		Gila River Zone	0	940	1100	69	3,000	56	22876
9876		Gila River Zone	0	940	1100	69	1,500	57	22876
J10	37	Gila River Zone	190	918	1099	78	3,190	56	22876
J100		Gila River Zone	0	939	1099	69	1,500	57	22876
J102		Gila River Zone	0	938	1099	70	1,500	57	22876
J104		Gila River Zone	0	926	1099	75	1,500	57	22876
J106		Gila River Zone	0	928	1099	74	1,500	57	22876
J108		Gila River Zone	0	930	1099	73	1,500	57	22876
J110		Gila River Zone	0	930	1099	73	1,500	57	22876
J112		Gila River Zone	0	928	1099	74	1,500	57	22876
J114		Gila River Zone	0	928	1099	74	1,500	54	J114
J116		Gila River Zone	0	931	1099	73	1,500	57	22876
J118		Gila River Zone	0	934	1099	72	1,500	57	22876
J12		Gila River Zone	0	926	1099	75	1,500	57	22876
J120		Gila River Zone	0	934	1099	72	1,500	57	22876
J14		Gila River Zone	0	919	1099	78	1,500	28	J14
J16		Gila River Zone	0	924	1099	76	1,500	13	J16
J18		Gila River Zone	0	924	1099	76	1,500	3	J18
J20		Gila River Zone	0	920	1099	77	1,500	23	J20
J22		Gila River Zone	0	917	1099	79	1,500	57	22876
J24		Gila River Zone	0	918	1099	78	1,500	53	J16
J26		Gila River Zone	0	919	1099	78	1,500	40	J26
J28		Gila River Zone	0	922	1099	77	1,500	25	J28
J3160	39	Gila River Zone	60	913	1099	80	1,560	57	22876
J3164	21	Zone 1	26	988	1164	76	3,026	57	22876
J3166	19	Zone 1	73	994	1159	72	3,073	49	22876
J3168	18	Zone 1	139	1010	1159	65	3,139	45	J3168
J3170	18.1	Zone 1	73	999	1159	69	3,073	48	22876
J3172	34	Gila River Zone	75	927	1099	74	1,575	57	22876
J3174	33	Gila River Zone	139	920	1099	77	3,139	56	22876
J3176	2	Gila River Zone	190	906	1098	83	3,190	56	22876
J3180	4	Gila River Zone	149	925	1099	75	1,649	57	22876
J3182	12	Zone 1	44	1000	1160	69	3,044	54	22876
J3184	17	Zone 1	102	1012	1159	64	3,102	44	J3184
J3186	30	Zone 1	63	952	1159	90	1,563	57	22876
J32		Gila River Zone	0	921	1099	77	1,500	34	J32
J3202	45.1	Zone 1	32	950	1159	90	3,032	56	22876
J3204		Zone 1	0	944	1156	92	3,000	56	22876
J3206		Zone 1	0	943	1158	93	3,000	56	22876
J3208		Zone 1	0	940	1160	95	1,500	57	22876
J3210		Gila River Zone	0	924	1099	76	1,500	57	22876
J3212		Gila River Zone	0	938	1099	70	1,500	57	22876
J3214	5.1	Zone 1	39	954	1157	88	3,039	56	22876
J3216		Gila River Zone	0	917	1099	79	1,500	41	J3216
J3218		Gila River Zone	0	921	1099	77	1,500	21	J18

**Maximum Day Demand
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Static Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
J3220		Gila River Zone	0	922	1099	77	1,500	57	22876
J3222		Zone 1	0	944	1159	93	3,000	56	22876
J34		Gila River Zone	0	942	1100	68	1,500	57	22876
J36		Gila River Zone	0	932	1099	72	1,500	48	J36
J38		Gila River Zone	0	932	1099	72	1,500	48	J38
J40		Gila River Zone	0	925	1099	75	1,500	43	J40
J418		Zone 1	0	975	1160	80	1,500	56	22876
J42		Gila River Zone	0	926	1099	75	1,500	39	J42
J420		Zone 1	5	975	1160	80	1,505	56	22876
J422		Zone 1	6	980	1160	78	1,506	56	22876
J424		Zone 1	2	979	1160	78	1,502	56	22876
J426		Zone 1	0	981	1160	77	1,500	56	22876
J428		Zone 1	0	982	1160	77	1,500	56	22876
J430		Zone 1	6	983	1160	77	1,506	56	22876
J432		Zone 1	39	980	1160	78	1,539	56	22876
J434		Zone 1	0	980	1160	78	1,500	56	22876
J436		Zone 1	0	981	1160	77	1,500	56	22876
J438		Zone 1	0	977	1160	79	1,500	56	22876
J44		Gila River Zone	0	930	1099	73	1,500	56	J44
J440	47	Zone 1	2	983	1160	77	1,502	56	22876
J442		Zone 1	3	985	1160	76	1,503	56	22876
J444		Zone 1	0	989	1160	74	1,500	55	22876
J446		Zone 1	0	984	1160	76	1,500	56	22876
J448		Zone 1	5	988	1160	74	1,505	56	22876
J450		Zone 1	4	987	1160	75	1,504	56	22876
J452		Zone 1	6	985	1160	76	1,506	56	22876
J454		Zone 1	4	983	1160	77	1,504	56	22876
J456		Zone 1	5	987	1160	75	1,505	56	22876
J458		Zone 1	3	984	1160	76	1,503	56	22876
J46		Gila River Zone	0	930	1099	73	1,500	50	J46
J460		Zone 1	1	990	1159	73	1,501	55	22876
J462		Zone 1	0	992	1159	73	1,500	55	22876
J464		Zone 1	0	993	1159	72	1,500	55	22876
J468		Zone 1	0	994	1159	72	1,500	55	22876
J470		Zone 1	0	995	1159	71	1,500	53	J470
J472		Zone 1	0	994	1159	72	1,500	55	22876
J474		Zone 1	0	993	1159	72	1,500	55	22876
J476		Zone 1	2	993	1159	72	1,502	55	22876
J48		Gila River Zone	0	926	1099	75	1,500	46	J48
J480		Zone 1	6	992	1159	73	1,506	55	22876
J482		Zone 1	4	993	1159	72	1,504	55	22876
J484		Zone 1	7	992	1159	73	1,507	55	22876
J486		Zone 1	8	990	1159	73	1,508	55	22876
J488		Zone 1	1	990	1159	73	1,501	55	22876
J490		Zone 1	5	986	1160	75	1,505	56	22876
J492		Zone 1	8	989	1160	74	1,508	56	22876
J494		Zone 1	5	987	1160	75	1,505	56	22876
J496		Zone 1	6	986	1160	75	1,506	56	22876
J498		Zone 1	5	984	1160	76	1,505	56	22876
J50		Gila River Zone	0	929	1099	74	1,500	46	J50
J502		Zone 1	2	988	1160	74	1,502	55	22876
J506		Zone 1	0	938	1159	96	1,500	57	22876
J52		Gila River Zone	0	930	1099	73	1,500	51	J52
J54		Gila River Zone	0	928	1099	74	1,500	46	J54

**Maximum Day Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Static Pressure (psi)	Total Demand MDD + Fire Flow (gpm)	Residual Pressure at Critical Node (psi)	Critical Node ID
J60		Gila River Zone	0	929	1099	74	1,500	57	22876
J64		Gila River Zone	0	929	1099	74	1,500	57	22876
J66		Gila River Zone	0	940	1099	69	1,500	55	J66
J68		Gila River Zone	0	939	1099	69	1,500	55	J68
J690		Gila River Zone	0	937	1099	70	1,500	57	22876
J692		Gila River Zone	0	929	1099	74	1,500	57	22876
J70		Gila River Zone	0	934	1099	72	1,500	57	22876
J72		Gila River Zone	0	934	1099	72	1,500	57	22876
J78		Gila River Zone	0	937	1099	70	1,500	57	22876
J80		Gila River Zone	0	936	1099	71	1,500	57	22876
J82		Gila River Zone	0	934	1099	72	1,500	57	22876
J84		Gila River Zone	0	932	1099	72	1,500	57	22876
J88		Gila River Zone	0	936	1099	71	1,500	57	22876
J90		Gila River Zone	0	938	1099	70	1,500	57	22876
J92		Gila River Zone	0	934	1099	72	1,500	57	22876
J94		Gila River Zone	0	935	1099	71	1,500	57	22876
J96		Gila River Zone	0	935	1099	71	1,500	57	22876
J98		Gila River Zone	0	937	1099	70	1,500	57	22876

**Peak Hour Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
101	Zone 1	22676	22836	1,294	16	140	1,640	2.62	1.76	1.36
103	Gila River Zone	22678	J34	1,290	16	120	515	0.82	0.27	0.21
105	Gila River Zone	22680	22682	2,663	16	125	-347	0.55	0.25	0.09
109	Gila River Zone	22684	J22	818	12	120	-14	0.04	0	0
111	Gila River Zone	22686	J10	1,112	12	120	155	0.44	0.1	0.09
113	Gila River Zone	22682	J3174	2,642	16	125	1,177	1.88	2.4	0.91
117	Gila River Zone	22690	22692	1,460	12	120	6	0.02	0	0
119	Gila River Zone	22692	22694	1,640	12	120	-95	0.27	0.06	0.04
121	Gila River Zone	22694	22696	1,179	12	120	-138	0.39	0.09	0.08
123	Gila River Zone	22696	19302	792	12	120	-399	1.13	0.42	0.54
1585	Zone 1	23518	22816	2,303	12	120	-520	1.48	2.02	0.88
1593	Zone 1	22698	22842	2,701	12	120	1,134	3.22	10.03	3.71
1597	Zone 1	23520	22676	2,604	12	120	-726	2.06	4.23	1.62
15FCCF	Gila River Zone	7136	7138	9	16	125	0	0	0	0
1603	Zone 1	23522	22672	1,412	24	140	5,771	4.09	2.74	1.94
1605	Zone 1	23524	J418	413	12	120	-490	1.39	0.32	0.78
1609	Zone 1	23526	J432	413	12	120	-333	0.95	0.16	0.38
20408A	Zone 1	6748	18488	801	6	100	8	0.09	0.01	0.02
2331	Gila River Zone	9874	10982	552	24	130	-1,226	0.87	0.07	0.13
2421	Gila River Zone	22684	J3180	1,279	12	120	-281	0.8	0.36	0.28
2429	Gila River Zone	23998	22682	1,994	16	120	187	0.3	0.06	0.03
2431	Gila River Zone	23998	10982	1,979	16	120	-559	0.89	0.49	0.25
2601	Zone 1	24070	24072	1,526	12	120	-53	0.15	0.02	0.01
2605	Zone 1	24072	3290	3,858	12	120	-53	0.15	0.05	0.01
275	Zone 1	3290	22648	1,465	24	130	-53	0.04	0	0
277	Zone 1	22698	23522	1,231	24	140	5,771	4.09	2.39	1.94
279	Zone 1	22670	22672	1,328	12	125	-851	2.42	2.69	2.02
27E5D8	Gila River Zone	19294	19302	1,686	16	125	1,226	1.96	1.65	0.98
281	Zone 1	20020	22672	2,647	16	125	-2,368	3.78	8.77	3.31
293	Zone 1	22674	J3214	1,189	12	120	902	2.56	2.89	2.43
295	Gila River Zone	22684	22818	1,316	12	120	295	0.84	0.4	0.31

**Peak Hour Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
299	Gila River Zone	22826	22828	5,264	12	120	-57	0.16	0.08	0.01
29F2B7	Zone 1	20028	22810	1,388	24	130	0	0	0	0
2B2A5	Zone 1	20482	22850	1,228	24	125	0	0	0	0
2B539	Zone 1	19990	20090	172	8	110	178	1.13	0.17	1.01
2B5CF	Zone 1	18542	18796	191	8	110	-84	0.53	0.05	0.25
2B5D2	Zone 1	18796	6748	170	8	110	40	0.26	0.01	0.06
2B5EF	Zone 1	18796	20350	839	24	130	-2,013	1.43	0.27	0.32
2B624	Zone 1	20350	18610	170	8	110	44	0.28	0.01	0.08
2B627	Zone 1	18666	20350	189	8	110	-84	0.53	0.05	0.25
2B62A	Zone 1	20350	20004	700	24	130	-2,148	1.52	0.25	0.36
2B64A	Zone 1	20344	20004	154	6	100	0	0	0	0
2B6A2	Zone 1	19990	20014	861	24	130	-2,596	1.84	0.44	0.51
2B6A5	Zone 1	20014	20028	499	24	130	-2,852	2.02	0.3	0.6
2B6CA	Zone 1	20326	20014	70	8	110	-226	1.44	0.11	1.58
2B7B6	Zone 1	20260	20290	549	6	100	-115	1.31	1.21	2.21
2B7CE	Zone 1	20274	20290	547	6	100	-100	1.13	0.92	1.68
2B7D4	Zone 1	20290	20326	117	8	110	-218	1.39	0.17	1.49
2B7B9	Zone 1	20264	20286	439	6	100	44	0.5	0.16	0.37
2B7EC	Zone 1	20286	20256	611	6	100	-3	0.04	0	0
2BB61	Zone 1	20264	20274	440	6	100	-19	0.21	0.03	0.08
2BBA9	Zone 1	20286	20260	881	6	100	23	0.26	0.1	0.11
2BBB8	Zone 1	20274	20256	269	6	100	63	0.71	0.19	0.71
2BBF9	Zone 1	20256	20260	269	6	100	45	0.51	0.1	0.38
2BC66	Zone 1	70	20038	170	6	100	6	0.07	0	0.01
2BC6C	Zone 1	20038	20264	269	6	100	38	0.44	0.08	0.29
2BC6F	Zone 1	70	20060	1,169	6	100	-27	0.3	0.17	0.15
2BC7E	Zone 1	20060	18828	680	6	100	-35	0.4	0.17	0.24
2BC8B	Zone 1	20030	19990	186	8	110	-223	1.42	0.29	1.54
2BC91	Zone 1	20038	20030	891	6	100	-51	0.58	0.43	0.49
2BC97	Zone 1	20060	20222	353	8	110	-71	0.45	0.06	0.18
2BC9D	Zone 1	20050	20222	307	8	110	80	0.51	0.07	0.23

**Peak Hour Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
2BCA0	Zone 1	20222	20050	562	6	100	-25	0.28	0.07	0.13
2BCAC	Zone 1	20030	20050	258	8	110	118	0.75	0.12	0.48
2C1AC	Zone 1	18594	20034	270	8	110	-97	0.62	0.09	0.33
2C1B2	Zone 1	20034	20118	611	8	110	-57	0.37	0.08	0.13
2C1C4	Zone 1	20086	20176	626	6	100	-25	0.28	0.08	0.13
2C1CE	Zone 1	20176	18818	233	6	100	2	0.03	0	0
2C1D7	Zone 1	18818	20086	426	6	100	30	0.34	0.08	0.18
2C1EF	Zone 1	20104	20118	360	6	100	-19	0.21	0.03	0.08
2C210	Zone 1	20090	20104	1,282	6	100	27	0.31	0.19	0.15
2C21D	Zone 1	20014	20076	171	8	110	25	0.16	0	0.03
2C220	Zone 1	20156	20076	459	8	110	-20	0.13	0.01	0.02
2C223	Zone 1	20076	20158	422	8	110	6	0.04	0	0
2C5DE	Zone 1	20006	18818	172	6	100	35	0.4	0.04	0.24
2C91E	Zone 1	20090	20118	449	8	110	103	0.66	0.17	0.37
2C924	Zone 1	20104	20034	1,006	6	100	15	0.17	0.05	0.05
2C930	Zone 1	20176	20090	270	6	100	-35	0.4	0.07	0.25
2C937	Zone 1	20086	20034	270	6	100	43	0.49	0.1	0.36
2C95A	Zone 1	20052	20030	234	6	100	-42	0.47	0.08	0.33
2C9A6	Zone 1	20004	20006	192	24	130	-2,150	1.53	0.07	0.36
2C9BB	Zone 1	19990	20006	539	24	130	2,190	1.55	0.2	0.37
2FE88	Gila River Zone	22864	7138	536	16	125	-611	0.97	0.14	0.27
2FFF4	Gila River Zone	7138	19302	2,608	16	125	-611	0.97	0.7	0.27
301	Gila River Zone	22828	22830	849	12	120	-244	0.69	0.18	0.22
303	Gila River Zone	22830	22824	2,392	24	120	-567	0.4	0.08	0.04
305	Gila River Zone	22688	22820	1,511	16	125	489	0.78	0.27	0.18
307	Gila River Zone	22820	22828	3,294	12	120	137	0.39	0.25	0.07
311	Gila River Zone	22822	13160	818	12	120	268	0.76	0.21	0.26
313	Gila River Zone	22822	22696	1,655	12	120	-179	0.51	0.2	0.12
315	Gila River Zone	22818	22834	2,599	24	125	-216	0.15	0.01	0.01
317	Gila River Zone	22834	22820	2,599	24	130	19	0.01	0	0
319	Gila River Zone	22834	J10	1,433	12	120	-235	0.67	0.29	0.2

**Peak Hour Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
321	Gila River Zone	22824	22832	1,628	12	120	-106	0.3	0.07	0.05
323	Zone 1	22836	J3208	982	16	140	772	1.23	0.33	0.34
32324	Zone 1	18796	J3202	840	24	130	1,882	1.33	0.23	0.28
327	Zone 1	22836	22838	1,602	12	120	474	1.35	1.18	0.74
329	Zone 1	22838	J3186	976	12	120	258	0.73	0.23	0.24
331	Zone 1	22664	22842	2,517	12	120	-473	1.34	1.85	0.73
335	Zone 1	22816	22652	366	12	120	-520	1.48	0.32	0.88
343	Zone 1	22850	J506	1,304	24	130	0	0	0	0
353	Gila River Zone	22824	22854	2,889	24	125	-571	0.41	0.1	0.03
35ACD	Zone 1	9738	18666	261	8	110	-28	0.18	0.01	0.03
35B3D	Zone 1	20060	9744	269	8	110	51	0.33	0.03	0.1
3.50E+90	Zone 1	18666	9744	954	6	100	6	0.07	0.01	0.01
35F26	Zone 1	9738	9732	567	6	100	3	0.03	0	0
35FF8	Zone 1	18610	18632	466	8	110	-1	0.01	0	0
36080	Zone 1	18630	18632	532	6	100	4	0.04	0	0
36095	Zone 1	18630	18594	337	8	110	-41	0.26	0.02	0.07
3.61E+04	Zone 1	18632	18630	301	8	110	-12	0.08	0	0.01
361FD	Zone 1	9718	9710	662	6	100	5	0.05	0	0.01
3.62E+02	Zone 1	18594	9718	270	6	100	19	0.21	0.02	0.08
36497	Zone 1	18610	10716	931	6	100	31	0.35	0.18	0.19
364F9	Zone 1	10716	9690	270	6	100	38	0.43	0.08	0.28
366FB	Zone 1	9702	18530	310	6	100	-12	0.14	0.01	0.03
36879	Zone 1	11034	10720	269	6	100	0	0	0	0
3.68E+09	Zone 1	11034	18542	691	6	100	-17	0.19	0.04	0.06
36919	Zone 1	18542	9702	600	6	100	16	0.18	0.03	0.05
36956	Zone 1	11034	18536	749	6	100	3	0.03	0	0
36959	Zone 1	18536	18530	439	6	100	-15	0.17	0.02	0.05
36990	Zone 1	10720	18536	480	6	100	3	0.04	0	0
36AD9	Zone 1	9726	18530	269	6	100	37	0.42	0.07	0.27
36AFA	Zone 1	6748	9690	786	6	100	-7	0.08	0.01	0.01
36BCF	Zone 1	9690	18488	587	6	100	13	0.15	0.02	0.04

**Peak Hour Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
3.91E+10	Zone 1	70	66	178	6	100	8	0.09	0	0.01
395	Gila River Zone	22864	22854	256	30	130	611	0.28	0	0.01
411	Zone 1	22876	23518	2,595	12	120	53	0.15	0.03	0.01
4.13E+02	Zone 1	22876	24070	5,276	12	120	-53	0.15	0.07	0.01
4E98B	Gila River Zone	13444	13440	93	20	130	0	0	0	0
4E991	Gila River Zone	13440	9876	66	20	130	0	0	0	0
50CFA	Gila River Zone	9876	12866	562	16	125	1,226	1.96	0.55	0.98
50CFB	Gila River Zone	19294	12866	382	16	125	-1,226	1.96	0.37	0.98
593	Zone 1	20052	18828	57	6	100	38	0.43	0.02	0.28
69	Zone 1	20028	23524	1,486	12	120	-490	1.39	1.17	0.78
71	Zone 1	22648	13166	288	24	130	125	0.09	0	0
73	Zone 1	22652	22650	2,698	12	120	495	1.4	2.16	0.8
75	Zone 1	22652	13164	2,218	12	120	-1,334	3.78	11.12	5.01
77	Zone 1	22652	22656	2,296	12	120	27	0.08	0.01	0
79	Zone 1	22656	22658	394	12	120	-13	0.04	0	0
83	Zone 1	22660	22662	987	12	120	274	0.78	0.26	0.27
85	Zone 1	22654	22662	1,480	12	120	-199	0.57	0.22	0.15
87	Zone 1	22654	22664	1,100	12	120	124	0.35	0.07	0.06
89	Zone 1	22664	22666	2,616	12	120	417	1.18	1.53	0.58
8B1A3	Zone 1	9710	18610	270	6	100	0	0	0	0
8B1B5	Zone 1	9726	18666	903	6	100	-35	0.39	0.21	0.24
8B397	Zone 1	10720	9702	269	6	100	-13	0.15	0.01	0.04
8B39A	Zone 1	10716	18594	1,422	6	100	-26	0.3	0.2	0.14
8C9E0	Gila River Zone	9874	9876	14	24	130	1,226	0.87	0	0.12
8CA72	Zone 1	20020	20028	1,309	24	130	2,364	1.68	0.56	0.43
8CB0B	Zone 1	9744	9726	1,339	6	100	27	0.31	0.21	0.15
8CB0E	Zone 1	9744	9732	348	8	110	8	0.05	0	0
8CB14	Zone 1	9732	9738	281	8	110	-10	0.06	0	0
8CB29	Zone 1	9710	9718	656	6	100	-5	0.05	0	0.01
8CB54	Zone 1	6748	18488	1,299	6	100	6	0.07	0.01	0.01
91	Zone 1	22666	22668	2,538	12	120	-597	1.69	2.87	1.13

**Peak Hour Demand
Pipe Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
93	Zone 1	22668	22670	1,341	12	125	-851	2.42	2.71	2.02
95	Zone 1	22666	22674	2,634	12	120	786	2.23	4.96	1.88
97	Zone 1	22674	23520	2,678	12	120	-373	1.06	1.27	0.47
99	Zone 1	22672	22676	2,628	16	140	2,488	3.97	7.73	2.94
P101	Gila River Zone	J88	J80	325	8	100	-19	0.12	0.01	0.02
P103	Gila River Zone	J90	J94	298	8	100	19	0.12	0.01	0.02
P105	Gila River Zone	J88	J90	954	8	100	10	0.07	0.01	0.01
P107	Gila River Zone	J92	J72	292	8	100	-24	0.15	0.01	0.03
P109	Gila River Zone	J94	J70	273	8	100	18	0.12	0.01	0.02
P111	Gila River Zone	J10	22688	2,594	12	120	39	0.11	0.02	0.01
P113	Gila River Zone	J92	J94	973	8	100	-1	0	0	0
P115	Gila River Zone	J96	J690	1,028	8	100	-33	0.21	0.05	0.05
P117	Gila River Zone	J96	J98	295	8	100	-26	0.17	0.01	0.03
P119	Gila River Zone	J100	J98	803	8	100	26	0.17	0.03	0.04
P121	Gila River Zone	J102	J100	2,012	8	100	7	0.05	0.01	0
P123	Gila River Zone	J100	J102	326	8	100	-19	0.12	0.01	0.02
P125	Gila River Zone	J104	J692	1,241	8	100	20	0.13	0.03	0.02
P127	Gila River Zone	J104	J106	295	8	100	-20	0.13	0.01	0.02
P129	Gila River Zone	J108	J112	296	8	100	20	0.13	0.01	0.02
P131	Gila River Zone	J110	J116	751	8	100	-27	0.17	0.03	0.04
P133	Gila River Zone	J12	J3220	692	8	120	170	1.08	0.55	0.79
P135	Gila River Zone	J108	J110	247	8	100	11	0.07	0	0.01
P137	Gila River Zone	J112	J106	299	8	100	20	0.13	0.01	0.02
P139	Gila River Zone	J112	J114	352	8	100	0	0	0	0
P141	Gila River Zone	J116	J108	542	8	100	31	0.2	0.03	0.05
P143	Gila River Zone	J116	J120	222	8	100	-59	0.37	0.03	0.16
P145	Gila River Zone	J118	22678	1,447	12	120	-532	1.51	1.32	0.91
P15	Gila River Zone	J120	J96	354	8	100	-59	0.38	0.06	0.16
P1673	Gila River Zone	J118	J120	179	8	100	0	0	0	0
	Gila River Zone	J14	J28	717	6	100	0	0	0	0
	Gila River Zone	J3160	22832	1,828	12	120	66	0.19	0.04	0.02

**Peak Hour Demand
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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/ft)
P1675	Gila River Zone	22820	J3160	3,184	12	120	-100	0.28	0.13	0.04
P1677	Trans	22854	22832	2,761	12	120	40	0.11	0.02	0.01
P1679	Gila River Zone	J10	22680	3,887	12	120	-442	1.25	2.52	0.65
P1681	Zone 1	22842	J3182	2,240	12	120	395	1.12	1.18	0.53
P1683	Zone 1	J3164	22698	424	24	120	-1,377	0.98	0.08	0.18
P1685	Zone 1	J3166	22650	839	24	130	-310	0.22	0.01	0.01
P1687	Zone 1	J3166	J3170	990	12	120	311	0.88	0.33	0.34
P1689	Zone 1	J3168	J3184	1,530	12	120	-50	0.14	0.02	0.01
P1691	Zone 1	J3170	J3168	1,670	12	120	187	0.53	0.22	0.13
P1693	Gila River Zone	J3172	22690	666	12	120	6	0.02	0	0
P1695	Gila River Zone	J3174	22688	1,070	16	125	719	1.15	0.39	0.36
P1697	Gila River Zone	J3172	J3174	1,059	12	100	-221	0.63	0.27	0.25
P1699	Gila River Zone	J3176	22826	2,161	12	120	106	0.3	0.1	0.05
P17	Gila River Zone	J18	J16	882	6	100	0	0	0	0
P1701	Gila River Zone	J3180	J118	1,247	12	120	-533	1.51	1.14	0.92
P1703	Zone 1	J3182	22658	174	12	120	45	0.13	0	0.01
P1705	Zone 1	22660	J3182	435	12	120	-274	0.78	0.12	0.27
P1707	Zone 1	J3184	23518	1,989	12	120	-224	0.63	0.37	0.18
P1711	Gila River Zone	J3176	22818	341	12	120	-430	1.22	0.21	0.61
P1715	Zone 1	22698	J430	3,296	12	120	1,091	3.1	11.39	3.46
P1727	Zone 1	J3202	J3222	809	24	130	1,979	1.4	0.25	0.31
P1729	Zone 1	J3186	J3202	1,983	12	120	151	0.43	0.18	0.09
P1731	Zone 1	J3204	V8000	242	12	120	1,132	3.21	0.9	3.7
P1733	Zone 1	J3208	V8002	216	16	140	573	0.91	0.04	0.19
P1735	Zone 1	J3204	J3206	2,639	8	120	-297	1.9	5.91	2.24
P1737	Zone 1	J3206	23520	2,281	8	120	-99	0.63	0.66	0.29
P1739	Zone 1	J3206	J3208	2,639	8	120	-199	1.27	2.8	1.06
P1741	Gila River Zone	J3172	22822	1,567	12	120	88	0.25	0.05	0.03
P1743	Zone 1	J506	V8006	94	8	120	0	0	0	0
P1745	Gila River Zone	J3212	J3210	2,444	8	120	0	0	0	0
P1747	Gila River Zone	19302	J3210	1,563	8	120	0	0	0	0

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P1749	Zone 1	RES9006	22698	551	24	120	9,438	6.69	3.54	6.42
P1751	Gila River Zone	RES9008	22682	8,488	24	120	966	0.69	0.8	0.09
P1753	Zone 1	V8000	22678	115	12	120	1,132	3.21	0.43	3.7
P1755	Zone 1	V8002	22682	223	16	140	573	0.91	0.04	0.19
P1757	Zone 1	V8004	10982	93	24	130	1,979	1.4	0.03	0.51
P1759	Zone 1	J3214	J3204	1,149	12	120	835	2.37	2.42	2.11
P1761	Gila River Zone	J3216	J14	294	6	100	0	0	0	0
P1763	Gila River Zone	J3218	J20	248	6	100	0	0	0	0
P1765	Gila River Zone	J3220	22686	382	8	120	170	1.08	0.3	0.79
P1769	Zone 1	J3222	V8004	28	24	130	1,979	1.4	0.01	0.31
P1771	Zone 1	J3222	20482	130	24	125	0	0	0	0
P1773	Gila River Zone	V8006	J3212	132	8	120	0	0	0	0
P19	Gila River Zone	J18	J3218	580	6	100	0	0	0	0
P21	Gila River Zone	J20	J26	297	6	100	0	0	0	0
P23	Gila River Zone	J22	22686	945	12	120	-14	0.04	0	0
P25	Gila River Zone	J24	J3216	332	6	100	0	0	0	0
P27	Gila River Zone	J22	J24	182	6	100	0	0	0	0
P29	Gila River Zone	J26	J24	327	6	100	0	0	0	0
P31	Gila River Zone	J28	J16	297	6	100	0	0	0	0
P33	Gila River Zone	J28	J32	930	6	100	0	0	0	0
P35	Gila River Zone	J32	J26	443	6	100	0	0	0	0
P37	Gila River Zone	J32	J3216	877	6	100	0	0	0	0
P39	Gila River Zone	J34	22680	1,317	16	120	345	0.55	0.13	0.1
P41	Gila River Zone	J34	J78	821	8	100	170	1.08	0.91	1.11
P43	Gila River Zone	J38	J84	331	6	100	-21	0.24	0.03	0.1
P45	Gila River Zone	J36	J44	285	6	100	21	0.24	0.03	0.09
P47	Gila River Zone	J38	J46	285	6	100	21	0.24	0.03	0.1
P49	Gila River Zone	J40	J48	626	6	100	-13	0.15	0.02	0.04
P501	Zone 1	J418	23526	675	12	120	-333	0.95	0.26	0.38
P503	Zone 1	J418	J420	204	8	120	-157	1	0.14	0.68
P505	Zone 1	J420	J422	1,044	8	120	-114	0.73	0.4	0.38

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P507	Zone 1	J422	J424	310	8	120	55	0.35	0.03	0.1
P509	Zone 1	J424	J420	1,080	6	120	51	0.57	0.37	0.34
P51	Gila River Zone	J44	J60	256	6	100	29	0.33	0.04	0.17
P511	Zone 1	J422	J426	272	8	120	-178	1.14	0.24	0.87
P513	Zone 1	J426	J428	280	8	120	-222	1.42	0.37	1.31
P515	Zone 1	J428	J430	174	8	120	-315	2.01	0.43	2.49
P517	Zone 1	J432	J440	422	12	120	-263	0.74	0.1	0.25
P519	Zone 1	J432	J434	184	12	100	-137	0.39	0.02	0.1
P521	Zone 1	J434	J428	665	6	120	-93	1.05	0.7	1.06
P523	Zone 1	J436	J434	240	12	100	0	0	0	0
P525	Zone 1	J434	J438	356	6	120	-44	0.5	0.09	0.26
P527	Zone 1	J438	J426	930	6	120	-44	0.5	0.24	0.26
P529	Zone 1	J440	J458	291	12	120	400	1.14	0.16	0.54
P53	Gila River Zone	J46	J50	290	6	100	12	0.14	0.01	0.03
P531	Zone 1	J430	J440	584	12	120	767	2.18	1.05	1.3
P533	Zone 1	J442	J490	185	12	120	307	0.87	0.06	0.33
P535	Zone 1	J444	J460	531	12	120	332	0.94	0.2	0.38
P537	Zone 1	J444	J448	216	8	120	-101	0.65	0.07	0.31
P539	Zone 1	J448	J450	302	8	120	-105	0.67	0.1	0.33
P541	Zone 1	J450	J452	339	8	120	-84	0.53	0.07	0.21
P543	Zone 1	J452	J446	347	8	120	-60	0.38	0.04	0.11
P545	Zone 1	J446	J454	614	8	120	-60	0.38	0.07	0.11
P547	Zone 1	J454	J452	681	6	120	34	0.38	0.11	0.16
P549	Zone 1	J454	J440	191	8	120	-101	0.64	0.06	0.3
P55	Gila River Zone	J44	J52	279	6	100	-8	0.09	0	0.02
P551	Zone 1	J442	J450	596	8	120	29	0.18	0.02	0.03
P553	Zone 1	J456	J502	98	12	120	303	0.86	0.03	0.32
P555	Zone 1	J456	J448	312	8	120	4	0.03	0	0
P557	Zone 1	J458	J442	163	12	120	340	0.96	0.06	0.4
P559	Zone 1	J460	J462	346	12	120	310	0.88	0.12	0.34
P561	Zone 1	J462	J464	303	12	120	287	0.81	0.09	0.29

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P563	Zone 1	J464	22648	251	12	120	352	1	0.11	0.42
P565	Zone 1	J464	J468	431	8	120	-65	0.41	0.06	0.13
P567	Zone 1	J468	J470	606	6	120	-18	0.2	0.03	0.05
P569	Zone 1	J470	J472	277	6	120	-18	0.2	0.01	0.05
P57	Gila River Zone	J48	J42	279	6	100	-6	0.07	0	0.01
P571	Zone 1	J472	J474	289	6	120	-18	0.2	0.01	0.05
P573	Zone 1	J474	J476	317	6	120	28	0.32	0.04	0.11
P577	Zone 1	J476	J462	413	8	120	-23	0.15	0.01	0.02
P579	Zone 1	J460	J480	637	8	120	20	0.13	0.01	0.02
P581	Zone 1	J480	J482	260	8	120	-35	0.23	0.01	0.04
P583	Zone 1	J482	J484	261	8	120	-42	0.27	0.02	0.06
P585	Zone 1	J484	J486	538	8	120	-54	0.35	0.05	0.1
P589	Zone 1	J486	J488	249	8	120	1	0.01	0	0
P59	Gila River Zone	J50	J42	507	6	100	6	0.07	0.01	0.01
P591	Zone 1	J490	J456	160	12	120	315	0.89	0.06	0.35
P593	Zone 1	J490	J492	685	6	120	-16	0.19	0.03	0.04
P595	Zone 1	J492	J494	340	6	120	-30	0.34	0.04	0.13
P597	Zone 1	J494	J496	329	8	120	-20	0.13	0.01	0.02
P599	Zone 1	J496	J498	950	8	120	-30	0.19	0.03	0.03
P601	Zone 1	J498	J458	166	8	120	-56	0.36	0.02	0.1
P605	Zone 1	J494	J498	713	6	120	-18	0.2	0.04	0.05
P607	Zone 1	J502	J444	178	12	120	231	0.65	0.03	0.19
P609	Zone 1	J486	J502	1,150	8	120	-68	0.44	0.17	0.15
P61	Gila River Zone	J48	J54	302	6	100	-7	0.08	0	0.01
P611	Zone 1	J480	J474	278	6	120	46	0.52	0.08	0.28
P613	Zone 1	J476	J468	306	8	120	47	0.3	0.02	0.07
P63	Gila River Zone	J52	J46	615	6	100	-10	0.11	0.01	0.02
P65	Gila River Zone	J54	J50	462	6	100	-6	0.07	0	0.01
P67	Gila River Zone	J52	J54	749	6	100	1	0.01	0	0
P71	Gila River Zone	J60	J40	524	6	100	-13	0.15	0.02	0.04
P75	Gila River Zone	J64	J12	457	8	100	170	1.08	0.51	1.11

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ID	Zone	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P77	Gila River Zone	J64	J60	194	6	100	-42	0.48	0.07	0.35
P79	Gila River Zone	J66	J68	876	8	100	8	0.05	0	0
P81	Gila River Zone	J68	J90	289	8	100	8	0.05	0	0
P83	Gila River Zone	J70	J82	335	8	100	18	0.12	0.01	0.02
P831	Gila River Zone	J690	J102	258	8	100	26	0.17	0.01	0.03
P833	Gila River Zone	J690	J78	197	8	110	-59	0.38	0.03	0.13
P835	Gila River Zone	J692	J110	638	8	100	-38	0.24	0.05	0.07
P837	Gila River Zone	J692	J64	203	8	100	59	0.37	0.03	0.16
P87	Gila River Zone	J66	J88	265	8	100	-8	0.05	0	0
P89	Gila River Zone	J78	J64	1,325	8	100	69	0.44	0.27	0.21
P91	Gila River Zone	J80	J72	337	8	100	24	0.15	0.01	0.03
P93	Gila River Zone	J78	J80	199	8	100	42	0.27	0.02	0.09
P95	Gila River Zone	J82	J92	370	8	100	-24	0.15	0.01	0.03
P97	Gila River Zone	J84	J36	552	6	100	21	0.24	0.05	0.09
P99	Gila River Zone	J82	J84	447	8	100	42	0.27	0.04	0.09

**Peak Hour Demand
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
10716		Zone 1	19	955	1146	83
10720		Zone 1	10	958	1145	81
10982	45	Gila River Zone	194	944	1100	67
11034		Zone 1	14	956	1145	82
12866		Gila River Zone	0	937	1099	70
13440		Gila River Zone	0	938	1100	70
18488		Zone 1	27	951	1145	84
18530		Zone 1	10	961	1145	80
18536		Zone 1	21	961	1145	80
18542		Zone 1	51	956	1145	82
18594		Zone 1	10	959	1146	81
18610		Zone 1	14	959	1146	81
18630		Zone 1	25	965	1146	78
18632		Zone 1	15	957	1146	82
18666		Zone 1	15	961	1146	80
18796		Zone 1	7	955	1145	82
18818		Zone 1	7	955	1146	83
18828		Zone 1	3	975	1146	74
19294		Gila River Zone	0	925	1099	75
19302	44	Gila River Zone	217	935	1097	70
19990		Zone 1	6	966	1146	78
20004		Zone 1	3	955	1146	83
20006		Zone 1	4	964	1146	79
20014		Zone 1	5	969	1147	77
20020		Zone 1	4	975	1148	75
20028	46	Zone 1	2	971	1147	76
20030		Zone 1	12	967	1146	78
20034		Zone 1	19	960	1146	80
20038		Zone 1	19	971	1146	76
20050		Zone 1	13	968	1146	77
20052		Zone 1	4	966	1146	78

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
20060		Zone 1	28	967	1146	78
20076		Zone 1	0	968	1147	77
20086		Zone 1	11	961	1146	80
20090		Zone 1	12	965	1146	78
20104		Zone 1	31	963	1146	79
20118		Zone 1	27	964	1146	79
20156		Zone 1	20	966	1147	78
20158		Zone 1	6	969	1147	77
20176		Zone 1	9	964	1146	79
20222		Zone 1	34	968	1146	77
20256		Zone 1	15	971	1145	76
20260		Zone 1	183	972	1145	75
20264		Zone 1	13	969	1145	76
20274		Zone 1	18	970	1146	76
20286		Zone 1	24	973	1145	75
20290		Zone 1	3	970	1146	77
20326		Zone 1	7	969	1147	77
20344		Zone 1	0	963	1146	79
20350		Zone 1	6	960	1146	81
20482		Zone 1	0	944	1145	87
22648	48	Zone 1	173	1005	1148	62
22650	20	Zone 1	185	998	1148	65
22652	15	Zone 1	292	1000	1150	65
22654	9	Zone 1	75	1003	1150	63
22656	14	Zone 1	40	1003	1150	64
22658	13	Zone 1	32	1004	1150	63
22660	11	Zone 1	0	1003	1150	64
22662	10	Zone 1	75	1003	1150	64
22664	8	Zone 1	179	996	1150	67
22666	7	Zone 1	228	980	1148	73
22668	24	Zone 1	254	974	1151	77

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
22670		Zone 1	0	965	1154	82
22672	25	Zone 1	64	985	1156	74
22674	6	Zone 1	257	963	1143	78
22676	26	Zone 1	121	958	1149	83
22678	5	Gila River Zone	85	945	1099	67
22680	27	Gila River Zone	250	944	1099	67
22682	31	Gila River Zone	202	940	1099	69
22684		Gila River Zone	0	927	1097	73
22686		Gila River Zone	0	925	1097	74
22688	38	Gila River Zone	269	915	1096	79
22690		Gila River Zone	0	926	1097	74
22692	35	Gila River Zone	101	944	1097	66
22694	36	Gila River Zone	43	935	1097	70
22696	40	Gila River Zone	81	928	1097	73
22698	22	Zone 1	64	989	1161	75
22810	50	Zone 1	0	967	1147	78
22816		Zone 1	0	1005	1150	63
22818	3	Gila River Zone	82	910	1096	81
22820	41	Gila River Zone	471	905	1096	83
22822		Gila River Zone	0	930	1096	72
22824	53	Gila River Zone	110	895	1096	87
22826	1	Gila River Zone	163	896	1096	86
22828	51	Gila River Zone	324	905	1096	83
22830	52	Gila River Zone	324	905	1096	83
22832	42	Gila River Zone	0	905	1096	83
22834		Gila River Zone	0	912	1096	80
22836	28	Zone 1	394	955	1147	83
22838	29	Zone 1	217	965	1146	78
22842	23	Zone 1	267	995	1151	68
22850		Zone 1	0	939	1145	89
22854	43	Gila River Zone	0	910	1096	81

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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
22864		Gila River Zone	0	911	1096	80
22876		Zone 1	0	1025	1148	53
23518	16	Zone 1	350	1015	1148	58
23520	26.1	Zone 1	254	959	1144	80
23522		Zone 1	0	983	1159	76
23524		Zone 1	0	975	1148	75
23526		Zone 1	0	980	1149	73
23998	32	Gila River Zone	372	952	1099	64
24070		Zone 1	0	1019	1148	56
24072		Zone 1	0	1014	1148	58
3290	49	Zone 1	0	992	1148	67
66		Zone 1	8	972	1146	75
6748		Zone 1	33	954	1145	83
70		Zone 1	13	971	1146	76
7136		Gila River Zone	0	914	1096	79
7138		Gila River Zone	0	914	1096	79
9690		Zone 1	18	954	1145	83
9702		Zone 1	15	959	1145	81
9710		Zone 1	10	960	1146	80
9718		Zone 1	9	960	1146	80
9726		Zone 1	25	962	1145	79
9732		Zone 1	21	964	1146	79
9738		Zone 1	15	962	1146	80
9744		Zone 1	22	966	1146	78
9874		Gila River Zone	0	940	1100	69
9876		Gila River Zone	0	940	1100	69
J10	37	Gila River Zone	324	918	1096	77
J100		Gila River Zone	0	939	1098	69
J102		Gila River Zone	0	938	1098	69
J104		Gila River Zone	0	926	1098	75
J106		Gila River Zone	0	928	1098	74

**Peak Hour Demand
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ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J108		Gila River Zone	0	930	1098	73
J110		Gila River Zone	0	930	1098	73
J112		Gila River Zone	0	928	1098	74
J114		Gila River Zone	0	928	1098	74
J116		Gila River Zone	0	931	1098	72
J118		Gila River Zone	0	934	1098	71
J12		Gila River Zone	0	926	1097	74
J120		Gila River Zone	0	934	1098	71
J14		Gila River Zone	0	919	1097	77
J16		Gila River Zone	0	924	1097	75
J18		Gila River Zone	0	924	1097	75
J20		Gila River Zone	0	920	1097	76
J22		Gila River Zone	0	917	1097	78
J24		Gila River Zone	0	918	1097	77
J26		Gila River Zone	0	919	1097	77
J28		Gila River Zone	0	922	1097	76
J3160	39	Gila River Zone	101	913	1096	79
J3164	21	Zone 1	43	988	1161	75
J3166	19	Zone 1	124	994	1148	67
J3168	18	Zone 1	237	1010	1148	60
J3170	18.1	Zone 1	124	999	1148	64
J3172	34	Gila River Zone	127	927	1097	73
J3174	33	Gila River Zone	237	920	1097	77
J3176	2	Gila River Zone	324	906	1096	82
J3180	4	Gila River Zone	251	925	1097	74
J3182	12	Zone 1	75	1000	1150	65
J3184	17	Zone 1	173	1012	1148	59
J3186	30	Zone 1	107	952	1145	84
J32		Gila River Zone	0	921	1097	76
J3202	45.1	Zone 1	54	950	1145	85
J3204		Zone 1	0	944	1138	84

**Peak Hour Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J3206		Zone 1	0	943	1144	87
J3208		Zone 1	0	940	1147	89
J3210		Gila River Zone	0	924	1097	75
J3212		Gila River Zone	0	938	1097	69
J3214	5.1	Zone 1	67	954	1140	81
J3216		Gila River Zone	0	917	1097	78
J3218		Gila River Zone	0	921	1097	76
J3220		Gila River Zone	0	922	1097	76
J3222		Zone 1	0	944	1145	87
J34		Gila River Zone	0	942	1099	68
J36		Gila River Zone	0	932	1098	72
J38		Gila River Zone	0	932	1098	72
J40		Gila River Zone	0	925	1098	75
J418		Zone 1	0	975	1148	75
J42		Gila River Zone	0	926	1098	75
J420		Zone 1	8	975	1149	75
J422		Zone 1	9	980	1149	73
J424		Zone 1	4	979	1149	74
J426		Zone 1	0	981	1149	73
J428		Zone 1	0	982	1150	73
J430		Zone 1	9	983	1150	72
J432		Zone 1	66	980	1149	73
J434		Zone 1	0	980	1149	73
J436		Zone 1	0	981	1149	73
J438		Zone 1	0	977	1149	75
J44		Gila River Zone	0	930	1098	73
J440	47	Zone 1	3	983	1149	72
J442		Zone 1	4	985	1149	71
J444		Zone 1	0	989	1149	69
J446		Zone 1	0	984	1149	71
J448		Zone 1	8	988	1149	70

**Peak Hour Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J450		Zone 1	7	987	1149	70
J452		Zone 1	10	985	1149	71
J454		Zone 1	7	983	1149	72
J456		Zone 1	8	987	1149	70
J458		Zone 1	5	984	1149	71
J46		Gila River Zone	0	930	1098	73
J460		Zone 1	2	990	1148	69
J462		Zone 1	0	992	1148	68
J464		Zone 1	0	993	1148	67
J468		Zone 1	0	994	1148	67
J470		Zone 1	0	995	1148	66
J472		Zone 1	0	994	1148	67
J474		Zone 1	0	993	1148	67
J476		Zone 1	4	993	1148	67
J48		Gila River Zone	0	926	1098	75
J480		Zone 1	10	992	1148	68
J482		Zone 1	7	993	1148	67
J484		Zone 1	12	992	1148	68
J486		Zone 1	13	990	1148	69
J488		Zone 1	1	990	1148	69
J490		Zone 1	9	986	1149	71
J492		Zone 1	14	989	1149	69
J494		Zone 1	8	987	1149	70
J496		Zone 1	10	986	1149	71
J498		Zone 1	8	984	1149	71
J50		Gila River Zone	0	929	1098	73
J502		Zone 1	4	988	1149	70
J506		Zone 1	0	938	1145	90
J52		Gila River Zone	0	930	1098	73
J54		Gila River Zone	0	928	1098	74
J60		Gila River Zone	0	929	1098	73

**Peak Hour Demand
Junction Data
West Goodyear Central Planning Area
Goodyear, Arizona**

ID	CVL ID	Zone	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J64		Gila River Zone	0	929	1098	73
J66		Gila River Zone	0	940	1098	69
J68		Gila River Zone	0	939	1098	69
J690		Gila River Zone	0	937	1098	70
J692		Gila River Zone	0	929	1098	73
J70		Gila River Zone	0	934	1098	71
J72		Gila River Zone	0	934	1098	71
J78		Gila River Zone	0	937	1098	70
J80		Gila River Zone	0	936	1098	70
J82		Gila River Zone	0	934	1098	71
J84		Gila River Zone	0	932	1098	72
J88		Gila River Zone	0	936	1098	70
J90		Gila River Zone	0	938	1098	69
J92		Gila River Zone	0	934	1098	71
J94		Gila River Zone	0	935	1098	71
J96		Gila River Zone	0	935	1098	71
J98		Gila River Zone	0	937	1098	70