NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW # ____ BY ____ DATE ____ Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)

	Preliminary Water Information				
1	Preliminary water information required with the following submittals: • General Plan Amendment • Rezone • PAD Application	☐	☐	☐	5.1.2.A.1.a
2	Is the project phased? If Yes a Master Water Report is required.	☐	☐	☐	5.1.2.A.1.a
3	Format: Memorandum	☐	☐	☐	
4	Signed and sealed by AZ PE	☐	☐	☐	
5	Project Description: • Project Name • Report Type (Preliminary Water Information) • Project Location (Major Cross Streets, Section Township & Range) • Project Area (Acre) • If residential - Number of Dwelling Units (DU) and DU/Acre	☐	☐	☐	
6	Identify Water Service Provider	☐	☐	☐	
7	Discuss the conceptual location and size of the existing and proposed water distribution and transmission mains within and adjacent to the site.	☐	☐	☐	5.1.2.A.1.a Verify that the water mains are consistent with the 2007 Integrated Water Master Plan
8	Identify Pressure Zone	☐	☐	☐	5.1.2.A.1.a Refer to the 2007 Integrated Water Master Plan Figure 5-2
9	Discuss Storage and Booster Facilities • Storage and booster location • Existing reservoir capacity • Existing booster pump capacity	☐	☐	☐	5.1.2.A.1.a Refer to the 2007 Integrated Water Master Plan: Figure 5-2 – Storage and booster locations Table 5-2 – Existing Reservoir capacity Table 5-3 – Existing booster pump capacity
10	Provide Demand Calculations Summary (Average Day, Max Day, Peak Hour and Max Day + Fire flow)	☐	☐	☐	5.1.2.A.2.g(5) Average Day from Table 5.1-1 Max Day Demand = Avg day x 1.7 Peak Hour Demand = Average Day x 2.9 Maximum Day Demand + Fire Flow • Fire flow Demand (5.1.6.D.1) o Residential 1,500 gpm (1 & 2 family du) o Commercial 3,500 gpm (commercial, industrial, multifamily)

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					Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)			
11	Irrigation Water Demand Calculations Max Day Demand = Avg x 1.8	☐	☐	☐	If a separate reclaimed water system will NOT be provided, the irrigation water demands must be added to the potable water demands. (Table 5.2-1). Peaking Factor 5.2.2.A.2.d.(5).ii			
12	Identify any foreseeable need to provide additional storage or booster pump capacity to serve the development.	☐	☐	☐	5.1.2.A.1.a			
13	Water System Exhibit including: Project Site Street Names North Arrow Existing Water Mains Conceptual Proposed Water Mains Proposed Connections to Existing System	☐	☐	☐	5.1.2.A.1.a			
Master Water Report								
1	A Master Water Report is required for each project which will be designed and constructed in a phased succession.	☐	☐	☐	5.1.2.A.2 The Master Water Report is provided with a rezone or PAD application.			
2	The Master Report shall follow the Outline provided at the end of Chapter 5.	☐	☐	☐	Outline is at the end of Chapter 5 (pages 37 to 39)			
3	Title Page: • Project Name • Location • Type of Report (Preliminary, Master Plan, Final) • Engineer's Seal & Signature (5.1.2.A.2) • Date • Consulting Firm, Name, Address, and Phone Number	☐	☐	☐	Chapter 5 Outline			
4	Table of Contents - Sealed and signed by a P.E.	☐	☐	☐	2.11.1.A.2			
	INTRODUCTION							
5	Project Name	☐	☐	☐	Chapter 5 Outline			
6	Report Type (Master Water Report)	☐	☐	☐	Chapter 5 Outline			
7	Project Description (Size, Area)	☐	☐	☐	Chapter 5 Outline			
8	General Land Use Proposed for Project	☐	☐	☐	2007 Integrated Water Master Plan - Figure 2-2 Land Use should coincide with Table 5.1-1 Average Day Water Demands			

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					BY / DATE	
9	Identify Water Service Provider	☐	☐	☐		If the water provider is NOT the City of Goodyear. The water report shall verify that the fire flow is consistent with the City's requirements and that adequate fire flow can be provided throughout the development.
10	Summarize on a parcel by parcel basis: Residential • Number of Dwelling Units (DU) • Unit density (DU/Acre) Commercial/Industrial • Acres	☐	☐	☐		Chapter 5 outline
11	Project Location (Major Cross Streets, Section Township & Range)	☐	☐	☐		Description of the location of the project and a Vicinity map shall be provided.
12	Topographic Conditions	☐	☐	☐		Chapter 5 Outline
13	Project Phasing	☐	☐	☐		5.1.2.A.2
	PROJECTED SYSTEM DEMANDS					
14	Summarize Water Demand Factors (include reference)	☐	☐	☐		Table 5.1-1
15	Summarize Peaking Factor (include reference)	☐	☐	☐		5.1.2.A.2.g(5).iv Peaking Factor = 2.9
16	Summarize water demands by phase in a table. Include full calculations in an appendix (Average Day, Max Day, Peak Hour, and Max Day + Fire Flow)	☐	☐	☐		5.1.2.A.2.g(5) Average Day from Table 5.1-1 Max Day Demand = Avg day x 1.7 Peak Hour Demand = Average Day x 2.9 Include landscape irrigation demands if not provided by a reclaimed water system.
17	Include Irrigation Demands as Required Max Day Demand = Avg x 1.8	☐	☐	☐		5.2.2.A.2.d.(5).ii & Table 5.2-1 If a separate reclaimed water system will NOT be provided, the irrigation water demands must be added to the potable water demands
18	Summarize Fire Flow Requirements: Flow & Duration (Include Reference)	☐	☐	☐		Fire flow Demand (5.1.6.D.1) • Residential 1,500 gpm (1 & 2 family du) • Commercial 3,500 gpm (commercial, industrial, multifamily) Fire Flow Duration= 3 hours (2007 Integrated Water Master Plan 5.6.2)
	EXISTING DISTRIBUTION SYSTEM					
19	Location and size of the existing and proposed water distribution and transmission mains adjacent to the site.	☐	☐	☐		5.1.2.A.2.h.1

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #	Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)
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						Show connection to the existing system. At a minimum 2 points of connection shall be provided to each parcel (5.1.2.A.2.b)
20	Identify Pressure Zone	☐	☐	☐		5.1.2.A.2.h.4 Refer to the 2007 Integrated Water Master Plan Figure 5-2
21	Discuss Storage and Booster Facilities • Storage and booster location • Existing reservoir capacity • Existing booster pump capacity	☐	☐	☐		Refer to the 2007 Integrated Water Master Plan: Figure 5-2 – Storage and booster locations Table 5-2 – Existing Reservoir capacity Table 5-3 – Existing booster pump capacity
22	Discuss existing system pressure range	☐	☐	☐		Chapter 5 Outline
	SYSTEM IMPROVEMENTS					
23	Summarize Design Criteria (include reference) • Demands • Pressure • Water production requirements • Cathodic protection requirements • Proposed right-of-way or easements	☐	☐	☐		5.1.2.A.2.c
24	Reservoir Storage • Summarize Required Storage • Adequacy of available storage • Ability to meet fire and domestic flow requirements. • Identify any need to provide additional storage capacity (rounded up to nearest 0.25 MG)	☐	☐	☐		5.1.2.A.2.a, 5.1.3.D.1, & 5.1.3.D.2 Sufficient storage should be provided to exceed: • 3 hours of fire flow + 25% of Max Day Demand • One Average Day Demand
25	Booster Pump Capacity • Identify any need to provide additional booster pump capacity	☐	☐	☐		Chapter 5 Outline
26	Water Source	☐	☐	☐		Chapter 5 Outline
27	Discuss connection to existing system	☐	☐	☐		5.1.2.A.2.b
	WATER MODEL					
28	Discuss setup of water model	☐	☐	☐		• Review the HGL for the water source. Is it consistent with the 2007 IWMP • If a fire flow test was used to set up the water source, verify the following: o The pump curve is consistent with the fire flow test

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					BY		DATE	
					Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)			
					o The pump is located at the same location as the tested fire hydrant. o The reservoir is the same elevation as the pump.			
29	Discuss Assumptions	☐	☐	☐	Chapter 5 Outline			
30	Discuss Modeling Software	☐	☐	☐	Chapter 5 Outline			
31	Discuss Fire Flow Test if connection to existing system (include in Appendix)	☐	☐	☐	Chapter 5 Outline			
32	Average Day Demand Analysis	☐	☐	☐	5.1.2.A.2.g.5.i and Table 5.1-1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that the flows match the demand calcs			
33	Maximum Day Demand Analysis Max Day Demand = 1.7 x Avg Day Demand	☐	☐	☐	5.1.2.A.2.g.5.ii & 5.1.2.A.2.g.1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that head loss per 1,000 feet of pipe does not exceed 8 ft/ft. (5.1.2.A.2.g.(5).vii) • Verify that the flows match the demand calcs			
34	Peak Hour Demand Analysis Peak Hour Demand = 2.9 x Avg Day Demand	☐	☐	☐	5.1.2.A.2.g.5.iv & 5.1.2.A.2.g.1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that head loss per 1,000 feet of pipe does not exceed 10 ft/ft. (5.1.2.A.2.g.(5).vii) • Verify that the flows match the demand calcs			
35	Fire Flow Demand Analysis Maximum Day Demand + Fire Flow	☐	☐	☐	5.1.2.A.2.g.1, 5.1.2.A.2.g.2, and 5.1.2.A.2.g.5.iii • Verify that the required fire flow is supplied to each node in the model (5.1.6.D) o 3,500 gpm (commercial, industrial, multifamily) o Residential 1,500gpm (1 & 2 family DU) o Buildings with automatic sprinkler systems demands are based on City Fire Code requirements • Verify that a 20 psi residual pressure is maintained throughout the model. (5.1.4.I.1)			
36	Discuss System Phasing	☐	☐	☐	• Verify that the system will be looped with a minimum of two points of connection to all parcels (5.1.2.A.2.b) • Verify that adequate looping will be provided to each phase of the development. • Ensure that adequate fire flow will be available to each phase of the development.			
	CONCLUSION							
37	Project Summary	☐	☐	☐	Chapter 5 Outline			
38	Project Phasing	☐	☐	☐	Chapter 5 Outline			

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #			
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	REFERENCES		
39	List references cited in the report	☐ ☐ ☐	Chapter 5 Outline
	APPENDIX		
40	Location Map	☐ ☐ ☐	5.1.2.A.2.h.(5) Show existing and proposed streets and parcels, surrounding the project to a distance of one mile from the exterior boundaries of the project.
41	Water System Exhibit • All on-site and off-site facilities should be shown on the exhibit	☐ ☐ ☐	5.1.2.A.2.h.(1) - Pump Stations, transmission and distribution mains, wells, and reservoirs. 5.1.2.A.2.h.(2)- Proposed street locations, parcel boundaries, and proposed lots. 5.1.2.A.2.h.(3) - Contour lines (5 or 10 foot intervals) 5.1.2.A.2.h.(4) - Pressure zone boundaries adjacent to or within the project. Pipe diameters color coded.
42	Node Id Exhibit	☐ ☐ ☐	Chapter 5 Outline The Node Id exhibit may be combined with the water system exhibit
43	Pipe Id Exhibit	☐ ☐ ☐	Chapter 5 Outline The Pipe Id exhibit may be combined with the water system exhibit
44	Phasing Exhibit	☐ ☐ ☐	Chapter 5 Outline Exhibit showing the proposed water system improvements for each project phase.
45	Average Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade	☐ ☐ ☐	Chapter 5 Outline

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	(Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft)		
46	Max Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft)	☐ ☐ ☐	Chapter 5 Outline
47	Peak Hour Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report	☐ ☐ ☐	Chapter 5 Outline 2007 IWMP 5.6.4 - The maximum velocity not to exceed 10 ft/s under peak hour demand conditions and friction loss gradient upper limit in the 2-3 ft/100 ft range under peak hour demand.

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	○ Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report ○ Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), ○ Include the pump curve as a separate output • Valve Report ○ Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft) • Velocity of Maximum Pipe (ft/s)		
48	Max Day + Fire Flow Scenario • Fire Flow Report ○ Label ○ Fire Flow Required (gpm) ○ Flow (Total Needed) (gpm) ○ Flow (Total Available) (gpm) ○ Residual Pressure Required (psi) ○ Residual Pressure (psi) ○ Lowest System Pressure (psi) ○ Junction w/ Minimum Pressure ○ Pipe w/ Maximum Velocity	☐ ☐ ☐	Chapter 5 Outline Verify that the results include the required fire flow at each node and that the minimum residual pressure requirements are met.
Preliminary Water Report			
1	A Preliminary Water Report is required for each project at the site plan or preliminary plat application.	☐ ☐ ☐	5.1.2.A.3.a
2	Preliminary Water Report shall be consistent with the approved Master Water Report	☐ ☐ ☐	5.1.2.A.3.b - If a Master Water Report was previously approved for the development the Preliminary Water Report shall follow the same development protocol as identified in the Master Water Report. However it will provide specific water demand and infrastructure needs to the phase of development being submitted.
3	The Preliminary Report shall follow the Outline provided at the end of Chapter 5.	☐ ☐ ☐	Outline is at the end of Chapter 5 (pages 37 to 39)
4	Title Page:	☐ ☐ ☐	Chapter 5 Outline

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #	Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)
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	• Project Name • Location • Type of Report (Preliminary, Master Plan, Final) • Engineer's Seal & Signature (5.1.2.A.2) • Date • Consulting Firm, Name, Address, and Phone Number				
5	Table of Contents - Sealed and signed by a P.E.	☐	☐	☐	2.11.1.A.2
	INTRODUCTION				
6	Project Name	☐	☐	☐	Chapter 5 Outline
7	Report Type (Master Water Report)	☐	☐	☐	Chapter 5 Outline
8	Project Description (Size, Area)	☐	☐	☐	Chapter 5 Outline
9	General Land Use Proposed for Project	☐	☐	☐	2007 Integrated Water Master Plan - Figure 2-2 Land Use should coincide with Table 5.1-1 Average Day Water Demands
10	Identify Water Service Provider	☐	☐	☐	If the water provider is NOT the City of Goodyear. The water report shall verify that the fire flow is consistent with the City's requirements and that adequate fire flow can be provided throughout the development.
11	Summarize on a parcel by parcel basis: Residential • Number of Dwelling Units (DU) • Unit density (DU/Acre) Commercial/Industrial • Acres	☐	☐	☐	Chapter 5 outline
12	Project Location (Major Cross Streets, Section Township & Range)	☐	☐	☐	Description of the location of the project and a Vicinity map shall be provided.
13	Topographic Conditions	☐	☐	☐	Chapter 5 Outline
14	Project Phasing	☐	☐	☐	5.1.2.A.3.b(1)
	PROJECTED SYSTEM DEMANDS				
15	Summarize Water Demand Factors (include reference)	☐	☐	☐	Table 5.1-1
16	Summarize Peaking Factor (include reference)	☐	☐	☐	5.1.2.A.2.g(5).iv Peaking Factor = 2.9
17	Summarize water demands by phase in a table. Include full calculations in an appendix (Average Day, Max Day, Peak Hour, and Max Day + Fire Flow)	☐	☐	☐	5.1.2.A.2.g(5) Average Day from Table 5.1-1 Max Day Demand = Avg day x 1.7 Peak Hour Demand = Average Day x 2.9

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #	Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)
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						Include landscape irrigation demands if not provided by a reclaimed water system.
18	Include Irrigation Demands as Required Max Day Demand = Avg x 1.8	☐	☐	☐		5.2.2.A.2.d.(5).ii & Table 5.2-1 If a separate reclaimed water system will NOT be provided, the irrigation water demands must be added to the potable water demands
19	Summarize Fire Flow Requirements: Flow & Duration (Include Reference)	☐	☐	☐		Fire flow Demand (5.1.6.D.1) • Residential 1,500 gpm (1 & 2 family du) • Commercial 3,500 gpm (commercial, industrial, multifamily) Fire Flow Duration= 3 hours (2007 Integrated Water Master Plan 5.6.2)
	EXISTING DISTRIBUTION SYSTEM					
20	Location and size of the existing and proposed water distribution and transmission mains adjacent to the site.	☐	☐	☐		5.1.2.A.2.h.1 Show connection to the existing system. At a minimum 2 points of connection shall be provided to each parcel (5.1.2.A.2.b)
21	Identify Pressure Zone	☐	☐	☐		5.1.2.A.2.h.4 Refer to the 2007 Integrated Water Master Plan Figure 5-2
22	Discuss Storage and Booster Facilities • Storage and booster location • Existing reservoir capacity • Existing booster pump capacity	☐	☐	☐		Refer to the 2007 Integrated Water Master Plan: Figure 5-2 – Storage and booster locations Table 5-2 – Existing Reservoir capacity Table 5-3 – Existing booster pump capacity
23	Discuss existing system pressure range	☐	☐	☐		Chapter 5 Outline
	SYSTEM IMPROVEMENTS					
24	Summarize Design Criteria (include reference) • Demands • Pressure • Water production requirements • Cathodic protection requirements • Proposed right-of-way or easements	☐	☐	☐		5.1.2.A.2.c
25	Reservoir Storage • Summarize Required Storage • Adequacy of available storage • Ability to meet fire and domestic flow requirements.	☐	☐	☐		5.1.2.A.2.a, 5.1.3.D.1, & 5.1.3.D.2 Sufficient storage should be provided to exceed: • 3 hours of fire flow + 25% of Max Day Demand • One Average Day Demand

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW # BY DATE Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)
	• Identify any need to provide additional storage capacity (rounded up to nearest 0.25 MG)				
26	Booster Pump Capacity • Identify any need to provide additional booster pump capacity	☐	☐	☐	Chapter 5 Outline
27	Water Source	☐	☐	☐	Chapter 5 Outline
28	Discuss connection to existing system	☐	☐	☐	5.1.2.A.2.b
	WATER MODEL				
29	Discuss setup of water model	☐	☐	☐	• Review the HGL for the water source. Is it consistent with the 2007 IWMP • If a fire flow test was used to set up the water source, verify the following: o The pump curve is consistent with the fire flow test o The pump is located at the same location as the tested fire hydrant. o The reservoir is the same elevation as the pump.
30	Discuss Assumptions	☐	☐	☐	Chapter 5 Outline
31	Discuss Modeling Software	☐	☐	☐	Chapter 5 Outline
32	Discuss Fire Flow Test if connection to existing system (include in Appendix)	☐	☐	☐	Chapter 5 Outline
33	Average Day Demand Analysis	☐	☐	☐	5.1.2.A.2.g.5.i and Table 5.1-1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that the flows match the demand calcs
34	Maximum Day Demand Analysis Max Day Demand = 1.7 x Avg Day Demand	☐	☐	☐	5.1.2.A.2.g.5.ii & 5.1.2.A.2.g.1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that head loss per 1,000 feet of pipe does not exceed 8 ft/ft. (5.1.2.A.2.g.(5).vii) • Verify that the flows match the demand calcs
35	Peak Hour Demand Analysis Peak Hour Demand = 2.9 x Avg Day Demand	☐	☐	☐	5.1.2.A.2.g.5.iv & 5.1.2.A.2.g.1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that head loss per 1,000 feet of pipe does not exceed 10 ft/ft. (5.1.2.A.2.g.(5).vii) • Verify that the flows match the demand calcs
36	Fire Flow Demand Analysis Maximum Day Demand + Fire Flow	☐	☐	☐	5.1.2.A.2.g.1, 5.1.2.A.2.g.2, and 5.1.2.A.2.g.5.iii • Verify that the required fire flow is supplied to each node in the model (5.1.6.D) o 3,500 gpm (commercial, industrial, multifamily) o Residential 1,500gpm (1 & 2 family DU)

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #			
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					o Buildings with automatic sprinkler systems demands are based on City Fire Code requirements • Verify that a 20 psi residual pressure is maintained throughout the model. (5.1.4.I.1)			
37	Discuss System Phasing	☐	☐	☐	• Verify that the system will be looped with a minimum of two points of connection to all parcels (5.1.2.A.2.b) • Verify that adequate looping will be provided to each phase of the development. • Ensure that adequate fire flow will be available to each phase of the development.			
	CONCLUSION							
38	Project Summary	☐	☐	☐	Chapter 5 Outline			
39	Project Phasing	☐	☐	☐	Chapter 5 Outline			
	REFERENCES							
40	List references cited in the report	☐	☐	☐	Chapter 5 Outline			
	APPENDIX							
41	Location Map	☐	☐	☐	5.1.2.A.2.h.(5) Show existing and proposed streets and parcels, surrounding the project to a distance of one mile from the exterior boundaries of the project.			
42	Water System Exhibit • All on-site and off-site facilities should be shown on the exhibit	☐	☐	☐	5.1.2.A.2.h.(1) - Pump Stations, transmission and distribution mains, wells, and reservoirs. 5.1.2.A.2.h.(2)- Proposed street locations, parcel boundaries, and proposed lots. 5.1.2.A.2.h.(3) - Contour lines (5 or 10 foot intervals) 5.1.2.A.2.h.(4) - Pressure zone boundaries adjacent to or within the project. Pipe diameters color coded.			
43	Node Id Exhibit	☐	☐	☐	Chapter 5 Outline The Node Id exhibit may be combined with the water system exhibit			
44	Pipe Id Exhibit	☐	☐	☐	Chapter 5 Outline The Pipe Id exhibit may be combined with the water system exhibit			
45	Phasing Exhibit	☐	☐	☐	Chapter 5 Outline			

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #	Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)
					BY / DATE	
						Exhibit showing the proposed water system improvements for each project phase.
46	Average Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft)	☐	☐	☐	Chapter 5 Outline	
47	Max Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft),	☐	☐	☐	Chapter 5 Outline	

NUMBER	ITEMS	NOT REQ'D	NOT DONE	SATISFIED	WATER REPORT REVIEW #	Location in City of Goodyear Engineering Design Standards & Policy Manual (2017 Edition)
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	o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft)				
48	Peak Hour Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft) • Velocity of Maximum Pipe (ft/s)	☐	☐	☐	Chapter 5 Outline 2007 IWMP 5.6.4 - The maximum velocity not to exceed 10 ft/s under peak hour demand conditions and friction loss gradient upper limit in the 2-3 ft/100 ft range under peak hour demand.
49	Max Day + Fire Flow Scenario • Fire Flow Report o Label o Fire Flow Required (gpm) o Flow (Total Needed) (gpm) o Flow (Total Available) (gpm) o Residual Pressure Required (psi) o Residual Pressure (psi) o Lowest System Pressure (psi) o Junction w/ Minimum Pressure	☐	☐	☐	Chapter 5 Outline Verify that the results include the required fire flow at each node and that the minimum residual pressure requirements are met.

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	o Pipe w/ Maximum Velocity					
Final Water Report						
1	A Final Water Report is required for each project at the construction document stage.	☐	☐	☐		5.1.2.A.4
2	The Preliminary Water Report shall be used as the basis for developing a Final Water Report.	☐	☐	☐		5.1.2.A.4.a
3	The Final Water Report shall finalize all design calculations and model information provided in the Preliminary Water Report.	☐	☐	☐		5.1.2.A.4.b
4	The Final Report shall follow the Outline provided at the end of Chapter 5.	☐	☐	☐		Outline is at the end of Chapter 5 (pages 37 to 39)
5	Title Page: • Project Name • Location • Type of Report (Preliminary, Master Plan, Final) • Engineer's Seal & Signature (5.1.2.A.2) • Date • Consulting Firm, Name, Address, and Phone Number	☐	☐	☐		Chapter 5 Outline
6	Table of Contents - Sealed and signed by a P.E.	☐	☐	☐		2.11.1.A.2
	INTRODUCTION					
7	Project Name	☐	☐	☐		Chapter 5 Outline
8	Report Type (Master Water Report)	☐	☐	☐		Chapter 5 Outline
9	Project Description (Size, Area)	☐	☐	☐		Chapter 5 Outline
10	General Land Use Proposed for Project	☐	☐	☐		2007 Integrated Water Master Plan - Figure 2-2 Land Use should coincide with Table 5.1-1 Average Day Water Demands
11	Identify Water Service Provider	☐	☐	☐		If the water provider is NOT the City of Goodyear. The water report shall verify that the fire flow is consistent with the City's requirements and that adequate fire flow can be provided throughout the development.
12	Summarize on a parcel by parcel basis: Residential • Number of Dwelling Units (DU) • Unit density (DU/Acre) Commercial/Industrial • Acres	☐	☐	☐		Chapter 5 outline

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13	Project Location (Major Cross Streets, Section Township & Range)	☐	☐	☐	Description of the location of the project and a Vicinity map shall be provided.
14	Topographic Conditions	☐	☐	☐	Chapter 5 Outline
15	Project Phasing	☐	☐	☐	5.1.2.A.3.b(1)
	PROJECTED SYSTEM DEMANDS				
16	Summarize Water Demand Factors (include reference)	☐	☐	☐	Table 5.1-1
17	Summarize Peaking Factor (include reference)	☐	☐	☐	5.1.2.A.2.g(5).iv Peaking Factor = 2.9
18	Summarize water demands by phase in a table. Include full calculations in an appendix (Average Day, Max Day, Peak Hour, and Max Day + Fire Flow)	☐	☐	☐	5.1.2.A.2.g(5) Average Day from Table 5.1-1 Max Day Demand = Avg day x 1.7 Peak Hour Demand = Average Day x 2.9 Include landscape irrigation demands if not provided by a reclaimed water system.
19	Include Irrigation Demands as Required Max Day Demand = Avg x 1.8	☐	☐	☐	5.2.2.A.2.d.(5).ii & Table 5.2-1 If a separate reclaimed water system will NOT be provided, the irrigation water demands must be added to the potable water demands
20	Summarize Fire Flow Requirements: Flow & Duration (Include Reference)	☐	☐	☐	Fire flow Demand (5.1.6.D.1) • Residential 1,500 gpm (1 & 2 family du) • Commercial 3,500 gpm (commercial, industrial, multifamily) Fire Flow Duration= 3 hours (2007 Integrated Water Master Plan 5.6.2)
	EXISTING DISTRIBUTION SYSTEM				
21	Location and size of the existing and proposed water distribution and transmission mains adjacent to the site.	☐	☐	☐	5.1.2.A.2.h.1 Show connection to the existing system. At a minimum 2 points of connection shall be provided to each parcel (5.1.2.A.2.b)
22	Identify Pressure Zone	☐	☐	☐	5.1.2.A.2.h.4 Refer to the 2007 Integrated Water Master Plan Figure 5-2
23	Discuss Storage and Booster Facilities • Storage and booster location • Existing reservoir capacity • Existing booster pump capacity	☐	☐	☐	Refer to the 2007 Integrated Water Master Plan: Figure 5-2 – Storage and booster locations Table 5-2 – Existing Reservoir capacity Table 5-3 – Existing booster pump capacity
24	Discuss existing system pressure range	☐	☐	☐	Chapter 5 Outline
	SYSTEM IMPROVEMENTS				
25	Summarize Design Criteria (include reference)	☐	☐	☐	5.1.2.A.2.c

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	• Demands • Pressure • Water production requirements • Cathodic protection requirements • Proposed right-of-way or easements							
26	Reservoir Storage • Summarize Required Storage • Adequacy of available storage • Ability to meet fire and domestic flow requirements. • Identify any need to provide additional storage capacity (rounded up to nearest 0.25 MG)	☐	☐	☐	5.1.2.A.2.a, 5.1.3.D.1, & 5.1.3.D.2 Sufficient storage should be provided to exceed: • 3 hours of fire flow + 25% of Max Day Demand • One Average Day Demand			
27	Booster Pump Capacity • Identify any need to provide additional booster pump capacity	☐	☐	☐	Chapter 5 Outline			
28	Water Source	☐	☐	☐	Chapter 5 Outline			
29	Discuss connection to existing system	☐	☐	☐	5.1.2.A.2.b			
	WATER MODEL							
30	Discuss setup of water model	☐	☐	☐	• Review the HGL for the water source. Is it consistent with the 2007 IWMP • If a fire flow test was used to set up the water source, verify the following: o The pump curve is consistent with the fire flow test o The pump is located at the same location as the tested fire hydrant. o The reservoir is the same elevation as the pump.			
31	Discuss Assumptions	☐	☐	☐	Chapter 5 Outline			
32	Discuss Modeling Software	☐	☐	☐	Chapter 5 Outline			
33	Discuss Fire Flow Test if connection to existing system (include in Appendix)	☐	☐	☐	Chapter 5 Outline			
34	Average Day Demand Analysis	☐	☐	☐	5.1.2.A.2.g.5.i and Table 5.1-1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that the flows match the demand calcs			
35	Maximum Day Demand Analysis Max Day Demand = 1.7 x Avg Day Demand	☐	☐	☐	5.1.2.A.2.g.5.ii & 5.1.2.A.2.g.1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that head loss per 1,000 feet of pipe does not exceed 8 ft/ft. (5.1.2.A.2.g.(5).vii)			

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								• Verify that the flows match the demand calcs
36	Peak Hour Demand Analysis Peak Hour Demand = 2.9 x Avg Day Demand	☐	☐	☐				5.1.2.A.2.g.5.iv & 5.1.2.A.2.g.1 • Verify pressures between 40 psi and 100 psi. (5.1.4.I.1) • Verify that head loss per 1,000 feet of pipe does not exceed 10 ft/ft. (5.1.2.A.2.g.(5).vii) • Verify that the flows match the demand calcs
37	Fire Flow Demand Analysis Maximum Day Demand + Fire Flow	☐	☐	☐				5.1.2.A.2.g.1, 5.1.2.A.2.g.2, and 5.1.2.A.2.g.5.iii • Verify that the required fire flow is supplied to each node in the model (5.1.6.D) o 3,500 gpm (commercial, industrial, multifamily) o Residential 1,500gpm (1 & 2 family DU) o Buildings with automatic sprinkler systems demands are based on City Fire Code requirements • Verify that a 20 psi residual pressure is maintained throughout the model. (5.1.4.I.1)
38	Discuss System Phasing	☐	☐	☐				• Verify that the system will be looped with a minimum of two points of connection to all parcels (5.1.2.A.2.b) • Verify that adequate looping will be provided to each phase of the development. • Ensure that adequate fire flow will be available to each phase of the development.
	CONCLUSION							
39	Project Summary	☐	☐	☐				Chapter 5 Outline
40	Project Phasing	☐	☐	☐				Chapter 5 Outline
	REFERENCES							
41	List references cited in the report	☐	☐	☐				Chapter 5 Outline
	APPENDIX							
42	Location Map	☐	☐	☐				5.1.2.A.2.h.(5) Show existing and proposed streets and parcels, surrounding the project to a distance of one mile from the exterior boundaries of the project.
43	Water System Exhibit • All on-site and off-site facilities should be shown on the exhibit	☐	☐	☐				5.1.2.A.2.h.(1) - Pump Stations, transmission and distribution mains, wells, and reservoirs. 5.1.2.A.2.h.(2)- Proposed street locations, parcel boundaries, and proposed lots. 5.1.2.A.2.h.(3) - Contour lines (5 or 10 foot intervals)

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						5.1.2.A.2.h.(4) - Pressure zone boundaries adjacent to or within the project. Pipe diameters color coded.
44	Node Id Exhibit	☐	☐	☐		Chapter 5 Outline The Node Id exhibit may be combined with the water system exhibit
45	Pipe Id Exhibit	☐	☐	☐		Chapter 5 Outline The Pipe Id exhibit may be combined with the water system exhibit
46	Phasing Exhibit	☐	☐	☐		Chapter 5 Outline Exhibit showing the proposed water system improvements for each project phase.
47	Average Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft)	☐	☐	☐		Chapter 5 Outline
48	Max Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report	☐	☐	☐		Chapter 5 Outline

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	o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft)							
49	Peak Hour Day Scenario • Junction Report o Label, Elevation (ft), Demand (gpm), Hydraulic Grade, Pressure (psi) • Pipe Report o Label, Length (ft), Start Node, Stop Node, Diameter (in), C-Factor, Flow (gpm), Velocity (ft/s), Headloss Gradient (ft/ft) • Reservoir Report o Label, Elevation (ft), Flow (gpm), Hydraulic Grade (ft) • Pump Report o Label, Elevation (ft), Hydraulic Grade (Suction) (ft), Hydraulic Grade (Discharge) (ft), Flow (gpm), Pump Head (ft), o Include the pump curve as a separate output • Valve Report o Label, Elevation, Pressure Setting, Flow (gpm), Hydraulic Grade (From)(ft), Hydraulic Grade (To)(ft), Headloss (ft) • Velocity of Maximum Pipe (ft/s)	☐	☐	☐	Chapter 5 Outline 2007 IWMP 5.6.4 - The maximum velocity not to exceed 10 ft/s under peak hour demand conditions and friction loss gradient upper limit in the 2-3 ft/100 ft range under peak hour demand.			

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50	Max Day + Fire Flow Scenario • Fire Flow Report o Label o Fire Flow Required (gpm) o Flow (Total Needed) (gpm) o Flow (Total Available) (gpm) o Residual Pressure Required (psi) o Residual Pressure (psi) o Lowest System Pressure (psi) o Junction w/ Minimum Pressure o Pipe w/ Maximum Velocity	☐	☐	☐	Chapter 5 Outline Verify that the results include the required fire flow at each node and that the minimum residual pressure requirements are met.			