City of Peoria

Utilities

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WATER AND SEWER IMPACT REPORT-2008

A Water and Sewer Impact Report (WSIR) is required for all new developments in the City of Peoria at the time of preliminary plat (or site plan) submission to determine the impact of the new development on the Peoria water and sewer systems. This document provides an overview of the minimum components to be included in the Water and Sewer Reports. Additional information and/or computer modeling may be required if the size and/or location of the new development will have a significant impact on the existing infrastructure. The report must be sealed by a professional engineer registered in the State of Arizona.

WSIR Report Format

As a minimum, the following information needs to be included with the WSIR. Additional, pertinent information may be included.

1. Development Data

    a. Name: Provide the name of the proposed development. Include the name of the developer and the point of contact for the reports.

    b. Location: Provide the general location of the proposed development using major crossroads. Additionally, provide the township, range and section(s) in which the proposed development is located. Include a vicinity map and an overall plan showing the proposed development.

    c. Zoning: Provide the current zoning of the proposed development and summarize any recent prior zoning changes that have been made to the parcel. Indicate whether a zoning change will be required for the new development. Indicate the pressure zone based on the City of Peoria Pressure Zone Exhibit (attached).

    d. Land Use: Provide the number of single family units, multi-family units, commercial acres, and the total acreage of the new development.

    e. Population: Provide the estimated population of the proposed development using the density factors per the *City of Peoria Water System Master Plan 2006*.

Projected Population Density	
Single Family (persons/dwelling)	2.9
Multi-Family (persons/dwelling)	1.7

2. Development Water Impacts

    a. Provide calculations of the average day demand (ADD) for WATER per the *City of Peoria Water System Master Plan 2006*. *(In lieu of using the commercial factors for GPD/SF in the Average Day Demand Table below, actual historic data can be submitted. Please provide adequate year-round data and discuss how the existing development that generated the data correlates to the proposed development in size, scope, and use.)*

Average Day Demand- Water		
Single Family Residential	161	GPCD
Multi-Family Residential	194	GPCD
Commercial High Rise	0.1	GPD/SF
Office/Business Park/Industrial	0.1	GPD/SF
Malls/Retail Areas	0.5	GPD/SF

*GPCD= gallons per capita per day
*GPD/SF= gallons per day per square foot

b. Calculate the maximum day demand (MDD) and the peak hour demand (PHD) for WATER using peaking factors per the *City of Peoria Water System Master Plan 2006*.

Peaking Factors- Water	
Max Day Demand=	Average Day Demand x 1.6
Peak Hour Demand=	Average Day Demand x 3.2

* If a development is a satellite system contact the Utilities Department for design peaking factors.

c. Based on Table B105.1- *Minimum Required Fire-Flow and Flow Duration for Buildings* from the *2006 International Fire Code (attached)*, indicate the maximum fire flow required for the development. Indicate whether the buildings will be sprinkled and any percent reduction to be considered. The final required fire flow will be determined by the Peoria Fire Department.

d. Based on the *Max Day+Fire Flow*, conclude the pipe size required.

3. Development Wastewater Impacts

a. Provide calculations for the average daily flow (ADF) for WASTEWATER per the *City of Peoria Wastewater Master Plan 2007.*

Average Daily Flow- Wastewater		
Residential	100	GPCD
Non-Residential	*Refer to AZ Admin. Code, Title 18, Chapter 9	

*Attached for Reference.

b. Calculate the maximum daily flow (MDF) for wastewater using the wet weather peaking factor per the *City of Peoria Wastewater Master Plan 2007.* Refer to the equations below:

Dry Weather Peaking Factor
PF_{DW} = Per A.A.C.R18-9-E301-D

Wet Weather Peaking Factor (*for projects in the Northern Planning Area)
$PF_{WW} = 1.16 \times PF_{DW}$

Wet Weather Peaking Factor (*for projects in the Southern Planning Area)
$PF_{WW} = 1.30 \times PF_{DW}$

Maximum Daily Flow
$MDF = ADF \times PF_{WW}$

*Beardsley Road is the boundary between the Northern and Southern Planning Areas.

c. Based on the MDF, conclude the pipe size and minimum and maximum slope required. Flow in pipe shall not exceed 80% of design capacity.

Peoria Pressure Zones

Lake Pleasant

10E

10W

9W

8W

7W

6W

5W

4W

7E

6E

5E

4E

3E

2E

1E

PRESSURE ZONES

- <all other values>
- 1E
- 2E
- 3E
- 4E
- 4W
- 5E
- 5W
- 6E
- 6W
- 7E
- 7W
- 8W
- 9W
- 10E
- 10W

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MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS[a]

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[c]	FLOW DURATION (hours)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. The minimum required fire flow shall be allowed to be reduced by 25 percent for Group R.
b. Types of construction are based on the *International Building Code*.
c. Measured at 20 psi.

B105.2 Buildings other than one- and two-family dwellings.

The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1.

12, 2005 (05-3).

Table 1. Unit Design Flows

Wastewater Source	**Applicable Unit**	**Sewage Design Flow per Applicable Unit, Gallons Per Day**
Airport	Passenger (average daily number) Employee	4 15
Auto Wash	Facility	Per manufacturer, if consistent with this Chapter
Bar/Lounge	Seat	30
Barber Shop	Chair	35
Beauty Parlor	Chair	100
Bowling Alley (snack bar only)	Lane	75
Camp Day camp, no cooking facilities Campground, overnight, flush toilets Campground, overnight, flush toilets and shower Campground, luxury Camp, youth, summer, or seasonal	 Camping unit Camping unit Camping unit Person Person	 30 75 150 100-150 50
Church Without kitchen With kitchen	 Person (maximum attendance) Person (maximum attendance)	 5 7
Country Club	Resident Member Nonresident Member	100 10
Dance Hall	Patron	5
Dental Office	Chair	500
Dog Kennel	Animal, maximum occupancy	15
Dwelling For determining design flow for sewage treatment facilities under R18-9-B202(A)(9)(a) and sewage collection systems under R18-9-E301(D) and R18-9-B301(K), excluding peaking factor.	Person	80
Dwelling For on-site wastewater treatment facilities per R18-9-E302 through R18-9-E323: Apartment Building 1 bedroom 2 bedroom 3 bedroom 4 bedroom Seasonal or Summer Dwelling (with recorded seasonal occupancy restriction) Single Family Dwellings Other than Single Family Dwelling, the greater flow value based on: Bedroom count 1-2 bedrooms Each bedroom over 2 Fixture count	 Apartment Apartment Apartment Apartment Resident see R18-9-A314(D)(1) Bedroom Bedroom Fixture unit	 200 300 400 500 100 see R18-9-A314(D)(1) 300 150 25
Fire Station	Employee	45
Hospital All flows Kitchen waste only Laundry waste only	 Bed Bed Bed	 250 25 40

Hotel/motel		
Without kitchen	Bed (2 person)	50
With kitchen	Bed (2 person)	60
Industrial facility		
Without showers	Employee	25
With showers	Employee	35
Cafeteria, add	Employee	5
Institutions		
Resident	Person	75
Nursing home	Person	125
Rest home	Person	125
Laundry		
Self service	Wash cycle	50
Commercial	Washing machine	Per manufacturer, if consistent with this Chapter
Office Building	Employee	20
Park (temporary use)		
Picnic, with showers, flush toilets	Parking space	40
Picnic, with flush toilets only	Parking space	20
Recreational vehicle, no water or sewer connections	Vehicle space	75
Recreational vehicle, with water and sewer connections	Vehicle space	100
Mobile home/Trailer	Space	250
Restaurant/Cafeteria	Employee	20
With toilet, add	Customer	7
Kitchen waste, add	Meal	6
Garbage disposal, add	Meal	1
Cocktail lounge, add	Customer	2
Kitchen waste disposal service, add	Meal	2
Restroom, public	Toilet	200
School		
Staff and office	Person	20
Elementary, add	Student	15
Middle and High, add	Student	20
with gym & showers, add	Student	5
with cafeteria, add	Student	3
Boarding, total flow	Person	100
Service Station with toilets	First bay	1000
	Each additional bay	500
Shopping Center, no food or laundry	Square foot of retail space	0.1
Store	Employee	20
Public restroom, add	Square foot of retail space	0.1
Swimming Pool, Public	Person	10
Theater		
Indoor	Seat	5
Drive-in	Car space	10

Note: Unit flow rates published in standard texts, literature sources, or relevant area or regional studies are considered by the Department, if appropriate to the project.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4). Amended by final rulemaking at 11 A.A.R. 4544, effective November 12, 2005 (05-3).

ARTICLE 4. NITROGEN MANAGEMENT GENERAL PERMITS

R18-9-401. Definitions

In addition to the definitions established in A.R.S. §§ 49-101 and 49-201 and A.A.C. R18-9-101, the following terms apply to this Article:

1. "Application of nitrogen fertilizer" means any use of a substance containing nitrogen for the commercial production of a crop or plant. The commercial production of a crop or plant includes commercial sod farms and nurseries.
2. "Contact stormwater" means stormwater that comes in contact with animals or animal wastes within a concentrated animal feeding operation.
3. "Crop or plant needs" means the amount of water and nitrogen required to meet the physiological demands of a crop or plant to achieve a defined yield.
4. "Crop or plant uptake" means the amount of water and nitrogen that can be physiologically absorbed by the roots

Table 6.2 Arizona Administrative Code Residential Dry Weather Peaking Factors for Wastewater Collection System Design City of Peoria, 2007 Wastewater Master Plan	
Upstream Population	**Dry Weather Peaking Factor**
100	3.62
200	3.14
300	2.90
400	2.74
500	2.64
600	2.56
700	2.50
800	2.46
900	2.42
1,000	2.38
1,001 to 10,000	$PF = \left(6.330 \text{ x } p^{-0.231}\right) + 1.094$
10,001 to 100,000	$PF = \left(6.177 \text{ x } p^{-0.233}\right) + 1.128$
More than 100,000	$PF = \left(4.500 \text{ x } p^{-0.174}\right) + 0.945$
PF = Dry Weather Peaking Factor p = Upstream Population Source: A.A.C. R18-9-E301-D	

Future sub-drainage basins were delineated in the northern planning areas for the purposes of routing flows to the appropriate WRF as described in Chapter 8. The dry weather peaking factor equations from the Arizona Administrative Code were applied to the populations of the sub-basin drainage area basis such that all loads generated in a particular basin would have the same peaking factor applied to them. Wet Weather Flows were calculated based on the analysis of the historical records described in Chapter 4. The Wet Weather Flow component for the sub-drainage basins in the Southern Planning Area was calculated as 30 percent of the average daily flow and for the sub-drainage basins in the northern planning areas the Wet Weather Flow component was calculated as 17 percent of the average daily flow. Table 6.3 shows the dry and wet weather peaking factors applied to each sub-drainage basin for the future planning year model scenarios.