Capacity Analysis Report

For

William E. Dunn Water Reclamation Facility
4111 Dunn Drive
Palm Harbor, Florida 34683

Florida Department of Environmental Protection
Facility Identification No. FLA0128775
Permit No. FLA0128775
Permit Expiration Date: January 26, 2015

June 25, 2014

PREPARED FOR:

Pinellas County Department of Environment and Infrastructure
Water and Sewer Division

PREPARED BY:

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CERTIFICATIONS

The undersigned permittee is fully aware of and intends to comply with the recommendations and schedules included in this report.

_____

Robert M. Powell
Director
Pinellas County Department of Environment and Infrastructure
Water and Sewer Division
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I certify that the information contained in this report is true and correct to the best of my knowledge, the report was prepared in accordance with sound engineering principles, and that I have discussed any recommendations and schedules contained herein with the permittee or the permittee's delegated representative.

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_____

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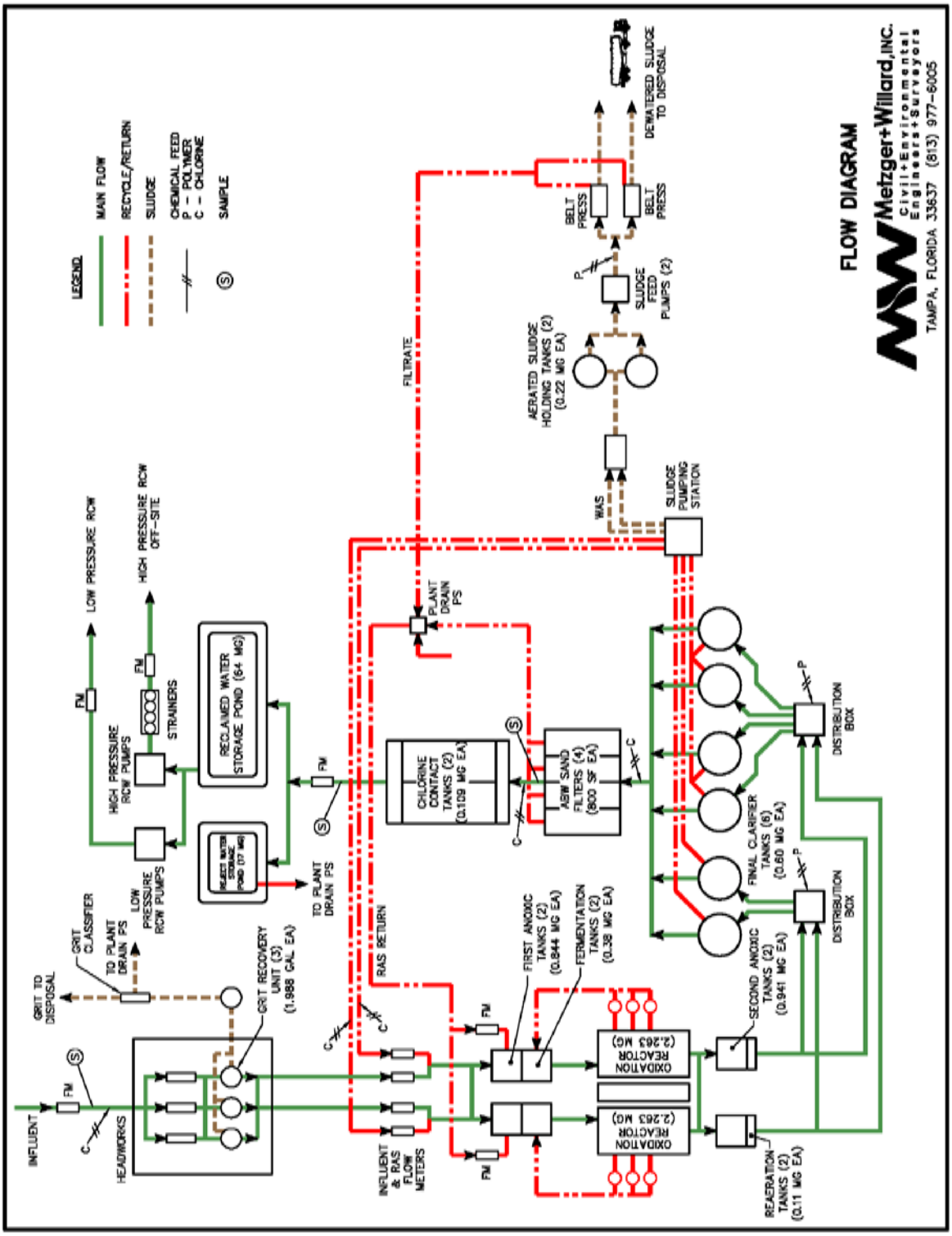
1.0 INTRODUCTION

This Capacity Analysis Report (CAR) supports the operation permit renewal for the William E. Dunn Water Reclamation Facility (WEDWRF) located in Pinellas County, Florida. The facility is currently rated for an annual average daily flow (AADF) of 9 million gallons per day (MGD) and utilizes a 5-stage Bardenpho activated sludge Advanced Wastewater Treatment process to achieve effluent quality requirements. A process schematic and flow diagram for the facility is shown in **Figure 1.** **Table 1-1** lists the major treatment processes and their corresponding volumes.

Table 1-1. Process Components and Volume of Structure

Component or Treatment Unit / Number of Units	Volume of Structure
Grit Chambers / 3	0.002 MG Each
Fermentation Tanks / 2	0.38 MG Each
First Stage Anoxic Tanks / 2	0.844 MG Each
Oxidation Reactors Nos. 1 and 2	2.263 MG Each
Oxidation Reactor No. 3	1.284 MG
Second Stage Anoxic Tanks / 2	0.941 MG Each
Re-aeration Tanks / 2	0.11 MG Each
Clarifier Nos. 1, 2, 3 and 4	0.60 MG Each
Clarifiers Nos. 5 and 6	0.665 MG Each
Sand Filters / 4	800 SF Each Surface Area
Chlorine Contact Chambers / 2	0.109 MG Each
Aerobic Sludge Holding Tanks / 2	0.22 MG Each
Reject Water Storage Pond / 1	17 MG
Reclaimed Water Storage Pond / 1	64 MG

Preliminary treatment components at the WEDWRF include mechanical bar screening and induced vortex grit recovery units. The biological treatment consists of two parallel Bardenpho trains that include mechanically mixed fermentation tanks, mechanically mixed anoxic tanks, mechanically aerated oxidation channels with internal recycle pumps, mechanically mixed second stage anoxic tanks, re-aeration tanks, final clarifiers and return activated sludge. In addition, a third oxidation train is included to provide additional biological treatment. This third train is interconnected with the two Bardenpho oxidation channels. Final treatment components include automatic backwashing dual media filters, chlorine contact basins, reclaimed water storage, and reclaimed water pumping. Treated wastewater that does not meet reclaimed water standards is discharged to a reject water storage pond to be returned to the treatment plant after the headworks structure and prior to the first anoxic zone for reprocessing. The wasted sludge is currently thickened, dewatered and transported to the Residuals Management Facility in the South Cross Bayou WRF for sludge stabilization and beneficial reuse.


FLOW DIAGRAM
Metzger+Willard, INC.
Civil+Environmental
Engineers+Surveyors
TAMPA, FLORIDA 33637 (813) 977-6005
LEGEND
MAIN FLOW
RECYCLE/RETURN
SLUDGE
CHEMICAL FEED
P - POLYMER
C - CHLORINE
SAMPLE
DEWATERED SLUDGE TO DISPOSAL
BELT PRESS
BELT PRESS
SLUDGE FEED PUMPS (2)
AERATED SLUDGE HOLDING TANKS (2) (0.22 MG EA)
FILTRATE
WAS
SLUDGE PUMPING STATION
PLANT DRAIN PS
LOW PRESSURE RCW
HIGH PRESSURE RCW OFF-SITE
STRAINERS
HIGH PRESSURE RCW PUMPS
LOW PRESSURE RCW PUMPS
RECLAIMED WATER STORAGE POND (64 MG)
CHLORINE CONTACT TANKS (2) (0.109 MG EA)
AGW SAND FILTERS (4) (800 SF EA)
DISTRIBUTION BOX
FINAL CLARIFIER TANKS (6) (0.60 MG EA)
DISTRIBUTION BOX
TO PLANT DRAIN PS
GRIT CLASSIFIER
TO PLANT DRAIN PS
GRIT TO DISPOSAL
GRIT RECOVERY UNIT (3) (1.988 GAL EA)
RAS RETURN
FIRST ANOXIC TANKS (2) (0.844 MG EA)
FERMENTATION TANKS (2) (0.38 MG EA)
OXIDATION REACTOR (2.263 MG)
OXIDATION REACTOR (2.263 MG)
SECOND ANOXIC TANKS (2) (0.941 MG EA)
INFLUENT
HEADWORKS
INFLUENT & RAS FLOW METERS
REAERATION TANKS (2) (0.11 MG EA)

2.0 EXISTING CONDITIONS

2.1 Permitted Capacities

The WEDWRF has a permitted capacity of 9 MGD AADF. The land application reuse system has a permitted capacity of 9 MGD AADF. The facility is permitted for residuals disposal at the South Cross Bayou facility or in a Class I solid waste landfill. Based on the discharge monitoring reports filed between January 2009 and December 2013, the AADF has not reached the permitted capacity and effluent quality characteristics have consistently met permit conditions.

2.2 Monthly Average Daily Flows (MADF), Three-month Average Daily Flows (TMADF), and Annual Average Daily Flows (AADF)

Based on available monthly operating reports from January 2009 to December 2013, the AADF was 6.5 MGD during this reporting period. The highest monthly average daily flow (MADF) reported during the previous three-year period occurred in July 2012 (7.67 MGD) and the maximum three-month average daily flow occurred in August 2012 (7.30 MGD). A maximum daily flow of 12.16 MGD was observed on June 25, 2012, after a 10.28-inch rainfall event.

Flows are monitored at the following locations as listed in the following table.

Table 2-1. Flow Monitoring Locations and Type.

Location	Designation	Type
Influent	FLW-01	ISCO Uni-Mag Magnetic Flow Meter
Effluent – WED WRF	FLW-02	Siemens SITRANS LUT 400 Ultrasonic Flow Meter
City of Clearwater	FLW-03	Reported by City of Clearwater
City of Oldsmar	FLW-04	Reported by City of Oldsmar
Reuse System	FLW-05	Calculated, FLW-02 + FLW-03 + FLW-04 = FLW-05

Monthly flow data from January 2003 to December 2013 for the WEDWRF is presented in **Table 2-2.** **Figure 2** provides a graphic illustration of influent flows to WED WRF between January 2003 and December 2013. **Figure 3** illustrates the flows from the WED WRF, the City of Clearwater and the City of Oldsmar into the Reclaimed Water System. **Figure 4** illustrates the reclaimed water usage by the connected customers.

The AADF over the period of data ranged from 6.4 to 6.7 MGD. **Table 2-3** presents the annual average daily flow per year between January 2003 and December 2013.

TABLE 2-2. FLOW DATA FOR WED WRF TREATMENT FACILITY AND REUSE SYSTEM										
		WED INFLUENT FLOW, MGD			EFFLUENT FLOW, MGD			REUSE SYSTEM, MGD		
YEAR	MONTH	MONTHLY AVERAGE, FLW-01	TMADF	AADF	WED EFFLUENT, FLW-02	CITY OF CLEAR-WATER, FLW-03	CITY OF OLDS-MAR, FLW-04	INFLUENT, FLW-05	TMADF	AADF
2003	Jan	6.8			6.8			6.8		
	Feb	6.8			6.8			6.8		
	Mar	6.7	6.8		6.7			6.7	6.8	
	Apr	6.6	6.7		6.6			6.6	6.7	
	May	6.4	6.6		6.4			6.4	6.6	
	Jun	6.6	6.5		6.6			6.6	6.5	
	Jul	6.8	6.6		6.8			6.8	6.6	
	Aug	7.3	6.9		7.3			7.3	6.9	
	Sep	7.2	7.1		7.2			7.2	7.1	
	Oct	7.6	7.4		7.6			7.6	7.4	
	Nov	7.6	7.5		7.6			7.6	7.5	
	Dec	7.6	7.6	7.0	7.6			7.6	7.6	7.0
2004	Jan	7.8	7.7	7.1	7.8			7.8	7.7	7.1
	Feb	8.0	7.8	7.2	8.0			8.0	7.8	7.2
	Mar	7.8	7.9	7.3	7.8			7.8	7.9	7.3
	Apr	7.7	7.8	7.4	7.7			7.7	7.8	7.4
	May	7.3	7.6	7.4	7.3			7.3	7.6	7.4
	Jun	7.2	7.4	7.5	7.2			7.2	7.4	7.5
	Jul	7.5	7.3	7.6	7.5			7.5	7.3	7.6
	Aug	8.0	7.6	7.6	8.0			8.0	7.6	7.6
	Sep	7.8	7.8	7.7	7.8			7.8	7.8	7.7
	Oct	7.7	7.8	7.7	7.7			7.7	7.8	7.7
	Nov	7.4	7.6	7.7	7.4			7.4	7.6	7.7
	Dec	7.5	7.5	7.6	7.1			7.1	7.4	7.6
2005	Jan	7.6	7.5	7.6	8.0			8.0	7.5	7.6
	Feb	7.7	7.6	7.6	8.5			8.5	7.9	7.7
	Mar	7.9	7.7	7.6	7.4			7.4	8.0	7.6
	Apr	7.6	7.7	7.6	8.9			8.9	8.3	7.7
	May	7.2	7.6	7.6	8.4			8.4	8.2	7.8
	Jun	7.5	7.4	7.6	6.3			6.3	7.9	7.8
	Jul	7.8	7.5	7.6	8.9			8.9	7.9	7.9
	Aug	7.5	7.6	7.6	8.0			8.0	7.7	7.9
	Sep	7.1	7.5	7.5	8.6			8.6	8.5	7.9
	Oct	7.2	7.3	7.5	6.8			6.8	7.8	7.9
	Nov	7.2	7.2	7.5	7.4			7.4	7.6	7.9
	Dec	7.2	7.2	7.5	7.0			7.0	7.1	7.9

TABLE 2-2. FLOW DATA FOR WED WRF TREATMENT FACILITY AND REUSE SYSTEM										
		WED INFLUENT FLOW, MGD			EFFLUENT FLOW, MGD			REUSE SYSTEM, MGD		
YEAR	MONTH	MONTHLY AVERAGE, FLW-01	TMADF	AADF	WED EFFLUENT, FLW-02	CITY OF CLEAR-WATER, FLW-03	CITY OF OLDS-MAR, FLW-04	INFLUENT, FLW-05	TMADF	AADF
2006	Jan	7.2	7.2	7.4	7.4			7.4	7.3	7.8
	Feb	7.3	7.2	7.4	6.5			6.5	7.0	7.6
	Mar	7.1	7.2	7.3	8.4			8.4	7.4	7.7
	Apr	6.8	7.1	7.3	7.6			7.6	7.5	7.6
	May	6.3	6.7	7.2	7.0			7.0	7.7	7.5
	Jun	6.1	6.4	7.1	5.8			5.8	6.8	7.5
	Jul	6.2	6.2	6.9	6.8			6.8	6.5	7.3
	Aug	6.5	6.3	6.9	6.8			6.8	6.5	7.2
	Sep	7.2	6.6	6.9	7.2			7.2	6.9	7.1
	Oct	6.5	6.7	6.8	8.2			8.2	7.4	7.2
	Nov	6.5	6.7	6.7	6.5			6.5	7.3	7.1
	Dec	6.4	6.5	6.7	6.9			6.9	7.2	7.1
2007	Jan	6.5	6.5	6.6	8.1			8.1	7.2	7.2
	Feb	6.5	6.5	6.6	8.0			8.0	7.7	7.3
	Mar	6.5	6.5	6.5	8.2			8.2	8.1	7.3
	Apr	6.3	6.4	6.5	7.3			7.3	7.8	7.2
	May	6.0	6.3	6.4	8.1			8.1	7.9	7.3
	Jun	6.1	6.1	6.4	7.3			7.3	7.6	7.5
	Jul	6.0	6.0	6.4	7.7			7.7	7.7	7.5
	Aug	6.5	6.2	6.4	7.2			7.2	7.4	7.6
	Sep	6.2	6.2	6.3	8.5			8.5	7.8	7.7
	Oct	6.2	6.3	6.3	7.6			7.6	7.8	7.6
	Nov	6.2	6.2	6.3	6.9			6.9	7.7	7.7
	Dec	6.3	6.2	6.3	6.2	0.9		7.1	7.2	7.7
2008	Jan	6.4	6.3	6.3	7.5	0.0		7.5	7.2	7.6
	Feb	6.6	6.4	6.3	6.8	0.4		7.2	7.3	7.6
	Mar	6.6	6.5	6.3	7.5	0.0	0.0	7.5	7.4	7.5
	Apr	6.4	6.5	6.3	7.7	1.3	0.1	9.1	7.9	7.6
	May	6.0	6.3	6.3	6.9	2.6	0.1	9.6	8.7	7.8
	Jun	6.0	6.1	6.3	6.8	2.6	0.1	9.5	9.4	8.0
	Jul	6.3	6.1	6.3	7.1	0.6	0.0	7.7	8.9	8.0
	Aug	6.7	6.3	6.3	6.8	0.0	0.0	6.8	8.0	7.9
	Sep	6.4	6.5	6.3	7.1	1.7	0.1	8.9	7.8	8.0
	Oct	6.2	6.4	6.3	6.7	1.9	0.0	8.6	8.1	8.0
	Nov	6.2	6.3	6.3	6.7	0.9	0.0	7.6	8.4	8.1
	Dec	6.2	6.2	6.3	5.5	0.1	0.0	5.6	7.3	8.0

TABLE 2-2. FLOW DATA FOR WED WRF TREATMENT FACILITY AND REUSE SYSTEM										
		WED INFLUENT FLOW, MGD			EFFLUENT FLOW, MGD			REUSE SYSTEM, MGD		
YEAR	MONTH	MONTHLY AVERAGE, FLW-01	TMADF	AADF	WED EFFLUENT, FLW-02	CITY OF CLEAR-WATER, FLW-03	CITY OF OLDS-MAR, FLW-04	INFLUENT, FLW-05	TMADF	AADF
2009	Jan	6.3	6.2	6.3	6.7	0.0	0.0	6.7	6.6	7.9
	Feb	6.4	6.3	6.3	6.7	0.2	0.0	6.9	6.4	7.9
	Mar	6.4	6.4	6.3	6.4	1.9	0.1	8.4	7.3	8.0
	Apr	6.2	6.3	6.3	6.8	2.0	0.1	8.9	8.1	7.9
	May	6.2	6.3	6.3	6.6	1.6	0.1	8.3	8.6	7.8
	Jun	6.1	6.2	6.3	7.0	3.0	0.3	10.3	9.2	7.9
	Jul	6.9	6.4	6.3	6.7	1.2	0.0	7.9	8.9	7.9
	Aug	6.7	6.6	6.3	6.5	1.4	0.0	7.9	8.7	8.0
	Sep	6.5	6.7	6.4	6.9	0.9	0.0	7.8	7.9	7.9
	Oct	6.3	6.5	6.4	6.7	2.4	0.0	9.1	8.3	8.0
	Nov	6.4	6.4	6.4	6.4	2.6	0.0	9.0	8.6	8.1
	Dec	6.6	6.4	6.4	7.5	0.1	0.0	7.6	8.6	8.3
2010	Jan	6.8	6.6	6.5	6.3	0.0	0.0	6.3	7.6	8.2
	Feb	6.7	6.7	6.5	5.5	0.5	0.1	6.1	6.7	8.2
	Mar	6.9	6.8	6.5	7.0	0.2	0.0	7.3	6.5	8.1
	Apr	6.8	6.8	6.6	7.4	1.5	0.2	9.1	7.5	8.1
	May	6.5	6.7	6.6	7.6	3.5	0.4	11.4	9.3	8.3
	Jun	6.4	6.6	6.6	6.6	4.2	0.5	11.3	10.6	8.4
	Jul	7.0	6.6	6.6	7.2	0.9	0.1	8.2	10.3	8.4
	Aug	7.4	6.9	6.7	6.8	0.5	0.2	7.5	9.0	8.4
	Sep	6.7	7.0	6.7	8.6	1.3	0.2	10.1	8.6	8.6
	Oct	6.3	6.8	6.7	7.3	3.9	0.4	11.6	9.7	8.8
	Nov	6.3	6.4	6.7	6.0	2.7	0.4	9.1	10.3	8.8
	Dec	6.4	6.3	6.7	6.5	1.0	0.3	7.8	9.5	8.8
2011	Jan	6.6	6.4	6.7	5.7	0.4	0.1	6.2	7.7	8.8
	Feb	6.6	6.5	6.7	7.2	0.6	0.0	7.8	7.3	9.0
	Mar	6.6	6.6	6.6	7.1	2.2	0.5	9.8	7.9	9.2
	Apr	6.8	6.7	6.6	7.9	1.4	0.3	9.6	9.1	9.2
	May	6.1	6.5	6.6	7.3	2.6	0.2	10.1	9.8	9.1
	Jun	6.0	6.3	6.6	6.2	2.6	0.2	9.0	9.6	8.9
	Jul	6.5	6.2	6.5	7.4	2.1	0.4	9.9	9.7	9.0
	Aug	6.9	6.4	6.5	6.6	1.7	0.4	8.8	9.2	9.1
	Sep	7.1	6.8	6.5	7.1	0.3	0.0	7.4	8.7	8.9
	Oct	6.5	6.8	6.5	7.3	2.0	0.3	9.6	8.6	8.8
	Nov	6.4	6.7	6.5	6.9	2.2	0.5	9.6	8.9	8.8
	Dec	6.5	6.5	6.5	7.2	1.5	0.2	8.8	9.3	8.9

TABLE 2-2. FLOW DATA FOR WED WRF TREATMENT FACILITY AND REUSE SYSTEM										
		WED INFLUENT FLOW, MGD			EFFLUENT FLOW, MGD			REUSE SYSTEM, MGD		
YEAR	MONTH	MONTHLY AVERAGE, FLW-01	TMADF	AADF	WED EFFLUENT, FLW-02	CITY OF CLEAR-WATER, FLW-03	CITY OF OLDS-MAR, FLW-04	INFLUENT, FLW-05	TMADF	AADF
2012	Jan	6.5	6.5	6.5	7.2	1.1	0.2	8.4	8.9	9.1
	Feb	6.5	6.5	6.5	7.3	1.1	0.1	8.5	8.6	9.1
	Mar	6.5	6.5	6.5	7.3	2.8	0.4	10.4	9.1	9.2
	Apr	6.4	6.5	6.5	7.1	2.8	0.4	10.3	9.7	9.2
	May	6.2	6.4	6.5	6.3	2.4	0.2	8.9	9.9	9.1
	Jun	7.2	6.6	6.6	6.2	1.1	0.2	7.4	8.8	9.0
	Jul	7.7	7.0	6.7	7.2	0.2	0.0	7.4	7.9	8.8
	Aug	7.1	7.3	6.7	7.5	1.1	0.3	8.9	7.9	8.8
	Sep	7.0	7.2	6.7	8.1	0.7	0.1	8.9	8.4	8.9
	Oct	6.6	6.9	6.7	9.1	1.6	0.3	11.0	9.6	9.0
	Nov	6.3	6.6	6.7	8.9	2.6	0.4	12.0	10.6	9.2
	Dec	6.4	6.4	6.7	6.2	1.5	0.3	8.0	10.3	9.2
2013	Jan	6.5	6.4	6.7	7.0	0.9	0.2	8.0	9.3	9.1
	Feb	6.5	6.5	6.7	7.1	0.9	0.2	8.2	8.1	9.1
	Mar	6.6	6.5	6.7	7.5	0.7	0.1	8.3	8.2	8.9
	Apr	6.4	6.5	6.7	7.4	2.0	0.3	9.7	8.7	8.9
	May	6.2	6.4	6.7	6.9	2.9	0.3	10.1	9.4	9.0
	Jun	6.3	6.3	6.6	6.2	1.4	0.3	7.9	9.2	9.0
	Jul	6.6	6.4	6.5	6.5	0.0	0.0	6.6	8.2	9.0
	Aug	6.8	6.6	6.5	6.3	0.8	0.2	7.4	7.3	8.8
	Sep	6.7	6.7	6.5	6.4	0.8	0.2	7.5	7.1	8.7
	Oct	6.6	6.7	6.5	9.1	1.6	0.3	11.0	8.6	8.7
	Nov	6.3	6.5	6.5	8.9	2.6	0.4	12.0	10.1	8.7
	Dec	6.4	6.4	6.5	6.2	1.5	0.3	8.0	10.3	8.7

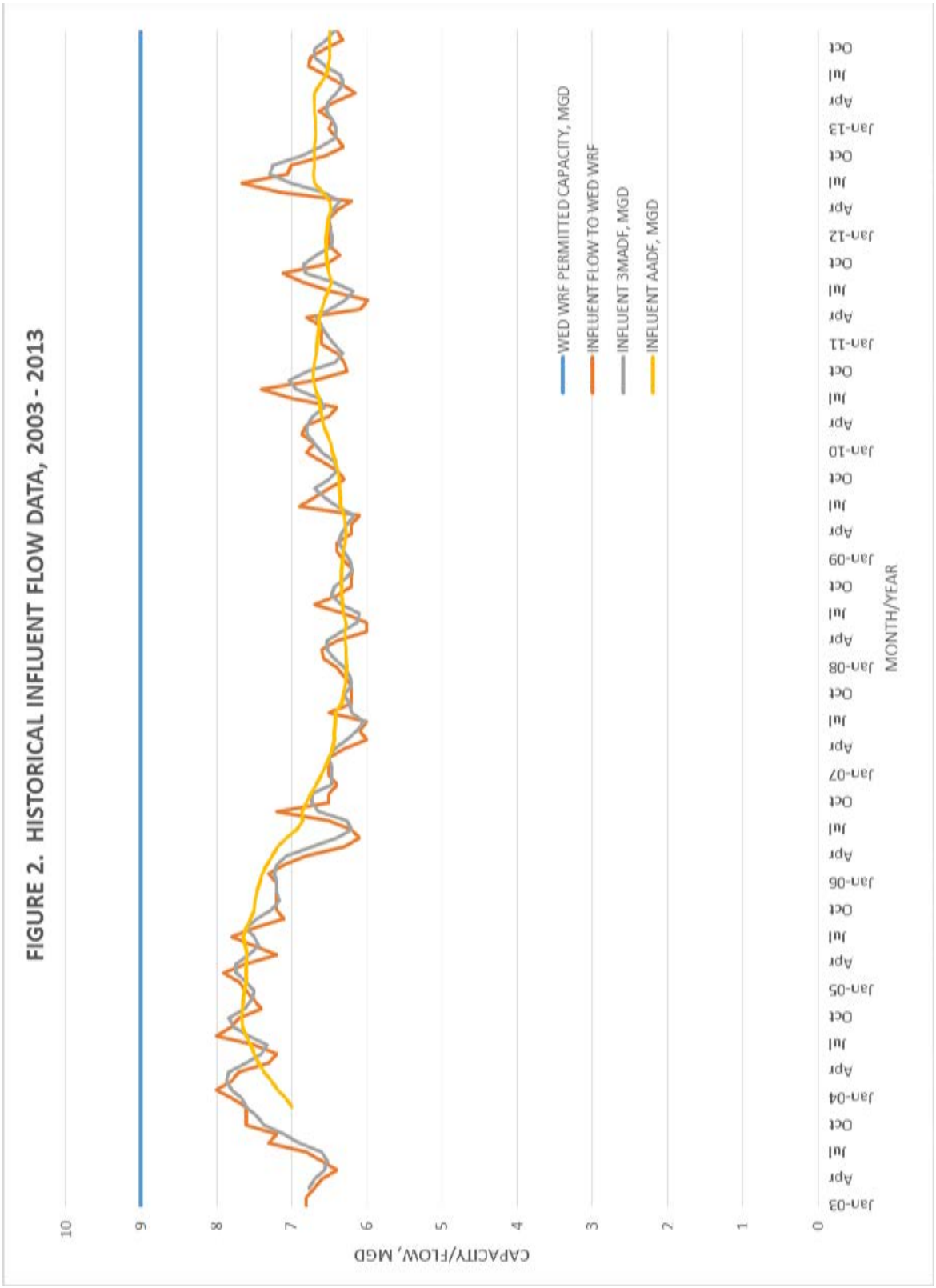


FIGURE 2. HISTORICAL INFLUENT FLOW DATA, 2003 - 2013
CAPACITY/FLOW, MGD
MONTH/YEAR
WED WRF PERMITTED CAPACITY, MGD
INFLUENT FLOW TO WED WRF
INFLUENT 3MADF, MGD
INFLUENT AADF, MGD
0
1
2
3
4
5
6
7
8
9
10
Jan-03
Apr
Jul
Oct
Jan-04
Apr
Jul
Oct
Jan-05
Apr
Jul
Oct
Jan-06
Apr
Jul
Oct
Jan-07
Apr
Jul
Oct
Jan-08
Apr
Jul
Oct
Jan-09
Apr
Jul
Oct
Jan-10
Apr
Jul
Oct
Jan-11
Apr
Jul
Oct
Jan-12
Apr
Jul
Oct
Jan-13
Apr
Jul
Oct

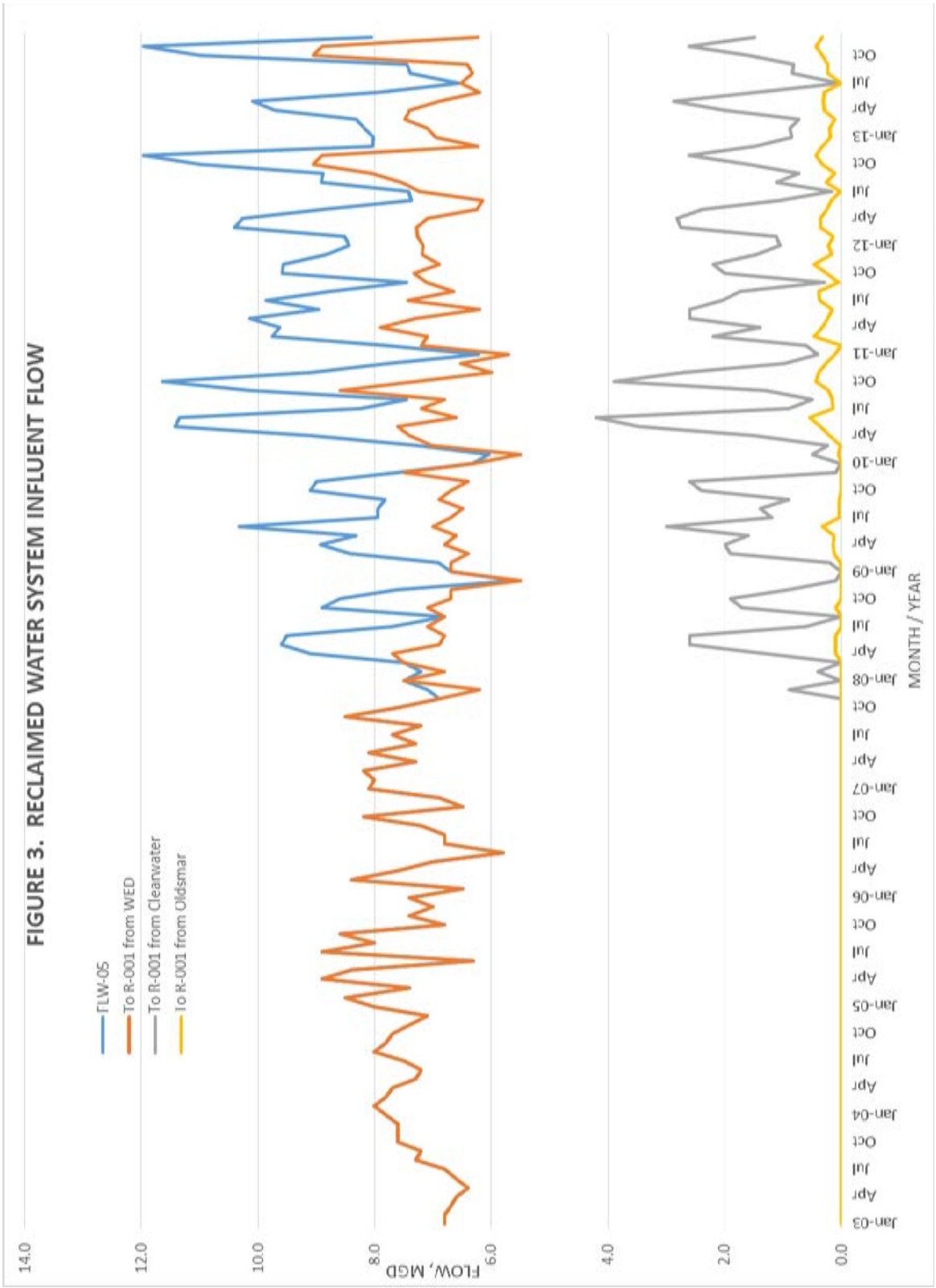


FIGURE 3. RECLAIMED WATER SYSTEM INFLUENT FLOW
FLW-05
To R-001 from WED
To R-001 from Clearwater
To R-001 from Oldsmar
FLOW, MGD
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
MONTH / YEAR
Jan-03
Apr
Jul
Oct
Jan-04
Apr
Jul
Oct
Jan-05
Apr
Jul
Oct
Jan-06
Apr
Jul
Oct
Jan-07
Apr
Jul
Oct
Jan-08
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Jan-13
Apr
Jul
Oct

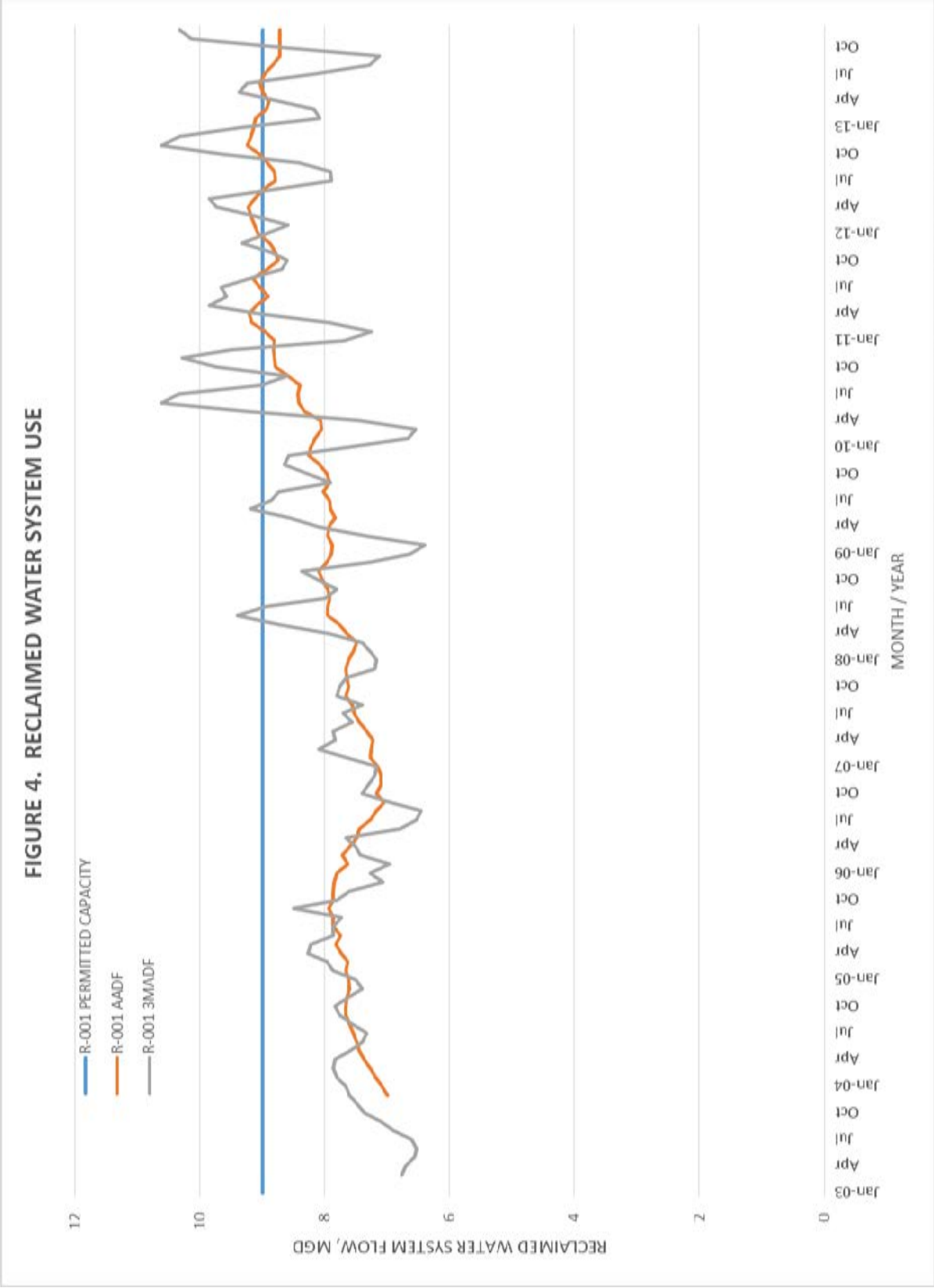


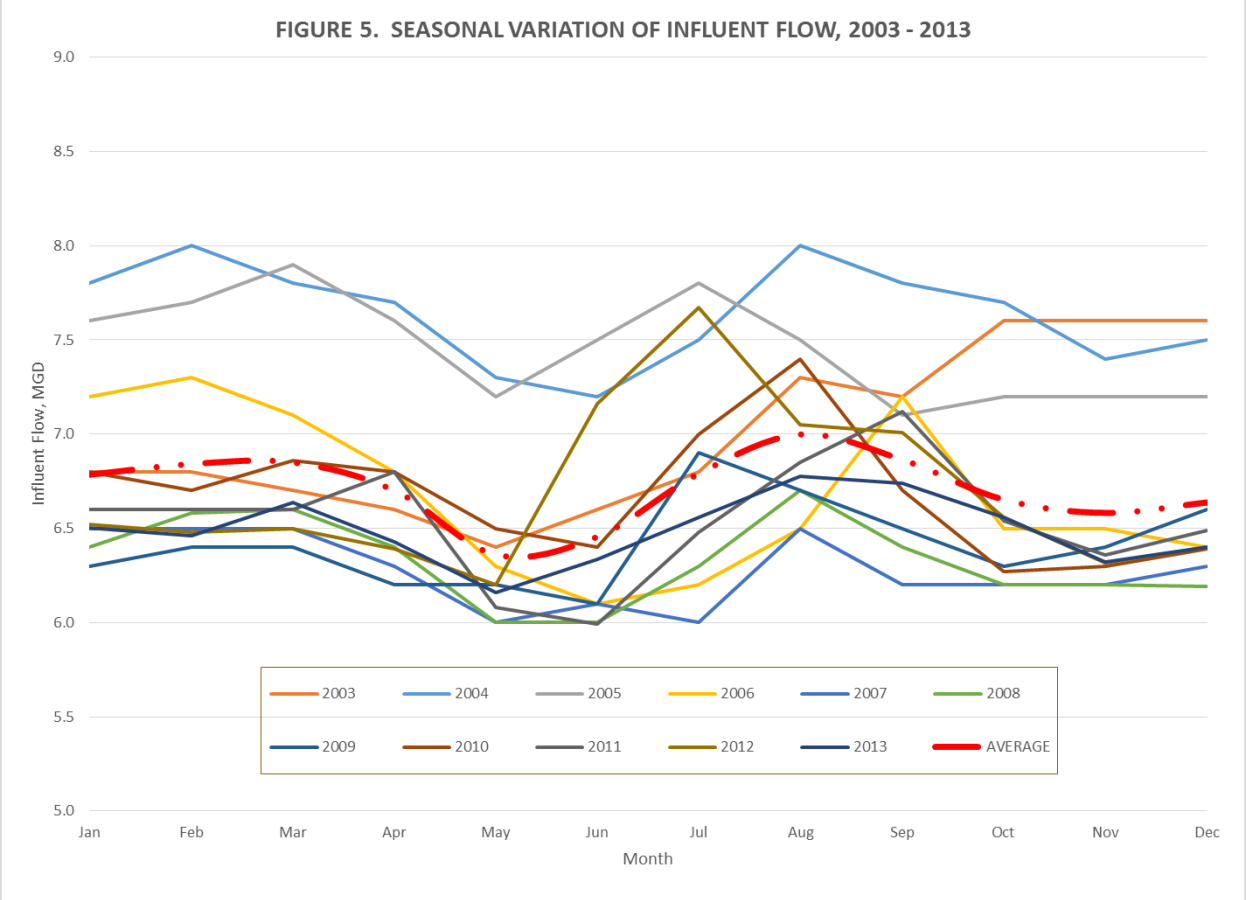
FIGURE 4. RECLAIMED WATER SYSTEM USE
R-001 PERMITTED CAPACITY
R-001 AADF
R-001 3MADF
RECLAIMED WATER SYSTEM FLOW, MGD
0
2
4
6
8
10
12
MONTH / YEAR
Jan-03
Apr
Jul
Oct
Jan-04
Apr
Jul
Oct
Jan-05
Apr
Jul
Oct
Jan-06
Apr
Jul
Oct
Jan-07
Apr
Jul
Oct
Jan-08
Apr
Jul
Oct
Jan-09
Apr
Jul
Oct
Jan-10
Apr
Jul
Oct
Jan-11
Apr
Jul
Oct
Jan-12
Apr
Jul
Oct
Jan-13
Apr
Jul
Oct

Table 2-3. Annual Average Daily Flow, 2003 – 2013	
Year	**Flow, MGD**
2003	7.0
2004	7.6
2005	7.5
2006	6.7
2007	6.3
2008	6.3
2009	6.4
2010	6.7
2011	6.5
2012	6.7
2013	6.5

2.3 Seasonal Variations in Flow

Some variations in flow were experienced at the facility in March and again in July and August each year. **Figure 5** illustrates the seasonal variations. An average over the study period is provided in the graphic. Variations of flow due to inflow or infiltration (I/I) were only experienced at the facility when rainfall was noted at 10-inches or more. Based on the above AADF and maximum TMADF, the ratios of the maximum TMADF to the AADF have been calculated to range from 1.01 to 1.10 and are summarized in **Table 2-4.**

Table 2-4. Ratio of TMADF to AADF for 2009 – 2013.			
Year	**Max TMADF, MGD**	**AADF, MGD**	**Ratio TMADF / AADF**
2009	6.7	6.3	1.06
2010	7.0	6.6	1.06
2011	6.8	6.6	1.04
2012	7.3	6.6	1.10
2013	6.7	6.6	1.01
Maximum			1.10
Minimum			1.01
Average			1.05



Based on monthly operating reports, the maximum TMADF typically occurred between the months of March and April of each year. The average ratio of the maximum TMADF to the AADF for the past five years was calculated to be approximately 1.05.

2.4 Updated Flow and Loading Information

The current loadings for the WEDWRF were estimated by using the discharge monitoring reports for 2009 to 2013.

Table 2-5 summarizes the design and current influent characteristics:

Table 2-5. Design and Current Influent Characteristics		
Parameter	**Design Annual Average**	**Influent Average (2009 – 2013)**
$CBOD_5$ (mg/L)	300	203
TSS (mg/L)	300	223
Total $N\text{-}NO_3$ (mg/L)	50	N/A
Phosphorus (mg/L)	10	N/A
Average Daily Flow (MGD)	9	6.5

The current $CBOD_5$ loading is approximately 32 percent lower than the loading value predicted by the design. TSS value is approximately 26 percent lower than the loading value predicted by the design. Effluent TSS concentrations are consistently met. Assuming continued proper maintenance and operating procedures as currently, the WEDWRF should effectively operate during the term of the permit.

3.0 FUTURE CONDITIONS

3.1 Population Projections

Population projections were provided by Pinellas County and were reported to be determined as follows: Permanent population estimates were derived from the trend analysis of the draft Pinellas County Population Projections for 2010 – 2040. Seasonal and Tourist Populations were determined from the Pinellas County Population Projections for 2006 – 2035. Projections were reported at five-year intervals and interim years were determined by interpolation. **Table 3-1** provides the population projections for the service area on a yearly basis from 2014 to 2023.

Table 3-1. Service Area Population Projection

Year	Estimated Population
2014	102,666
2015	102,755
2016	102,844
2017	102,933
2018	103,022
2019	103,111
2020	103,200
2021	103,289
2022	103,378
2023	103,467

3.2 Flow Projections

Based on the population projections made by Pinellas County, the service area population is expected to increase by less than one percent by the year 2023. Assuming that wastewater production increases proportionally to the population, the flow to the WEDWRF is expected to increase by approximately 0.1 percent per year. Using the average ratio defined in **Section 2.3**, and the population projections from the Pinellas County Planning Department, the future AADF and yearly maximum TMADF have been estimated for each of the next 10 years and are summarized in **Table 3-2.** Based upon the historical flow of 63 gpcd, the maximum service population is approximately 142,900.

Table 3-2. Projected Flow Summary – 2013 – 2023.		
Year	**Projected Maximum TMADF (MGD)**	**Projected AADF (MGD)**
2013	6.67	6.46
2014	6.67	6.47
2015	6.68	6.47
2016	6.68	6.48
2017	6.69	6.48
2018	6.70	6.49
2019	6.70	6.50
2020	6.71	6.50
2021	6.71	6.51
2022	6.72	6.51
2023	6.73	6.52

The AADF by the year 2023 is estimated to be approximate 6.52 MGD which is 28 percent under the WEDWRF permitted capacity. **Figure 6** provides a graphic illustration of the projected AADF and maximum TMADF for the facility.

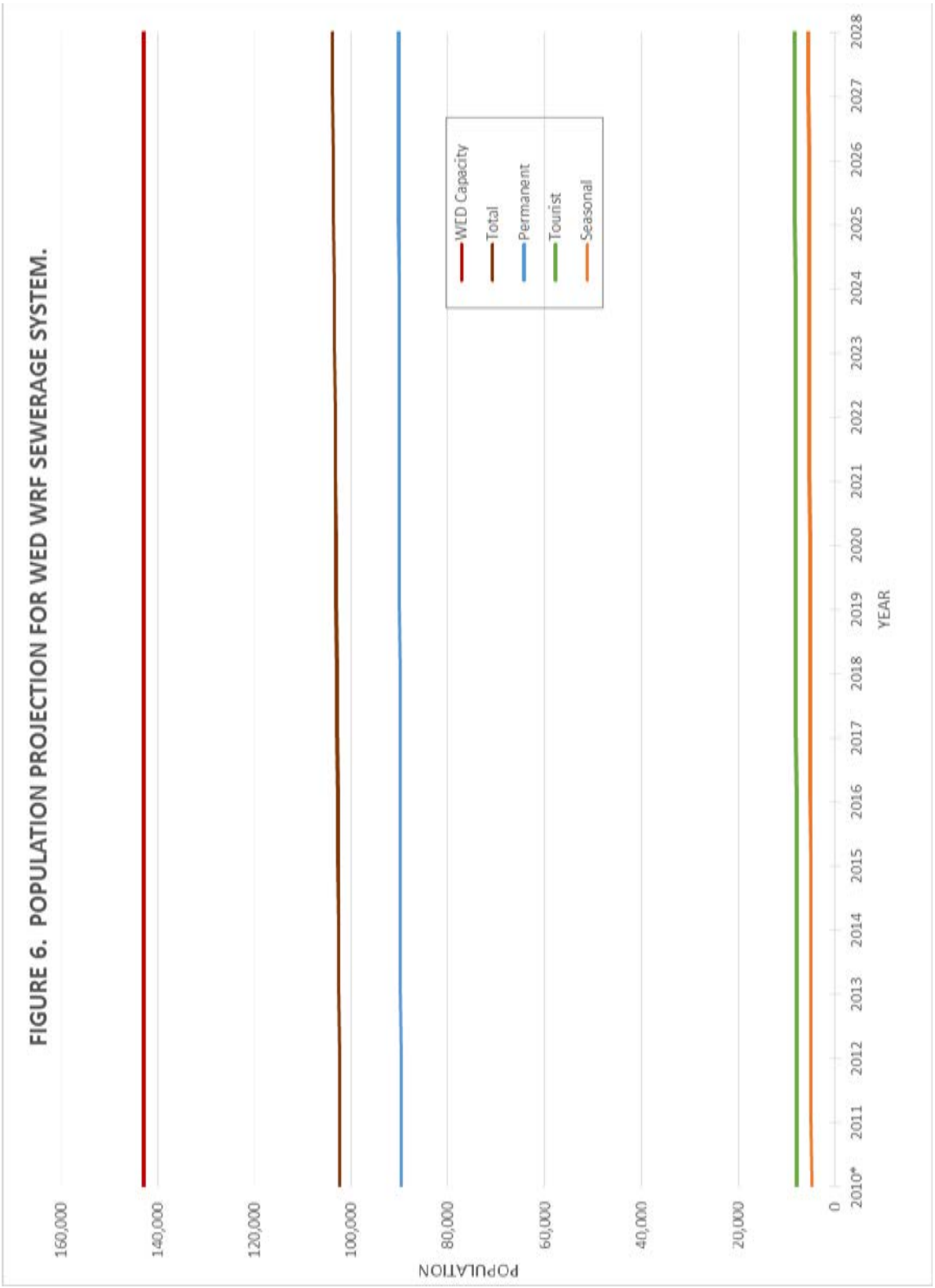


FIGURE 6. POPULATION PROJECTION FOR WED WRF SEWERAGE SYSTEM.

4.0 SUMMARY AND CONCLUSIONS

4.1 Time Required to Reach the Permitted Capacity

The existing WEDWRF permitted capacity is based on the annual average daily flow, not on the three-month average daily flow. The annual average daily flow for 2013 was 6.5 MGD. This is within below the facility's permitted capacity of 9 MGD. **Table 4-1** presents a comparison between the permitted capacity and the projected maximum TMADF for the next 10 years.

Table 4-1. Projected Maximum TMADF and Permitted Capacity.

Year	Maximum TMADF (MGD)	Permitted Capacity (MGD)	Percentage (%)
2013	6.67	9	74.11
2014	6.67	9	74.11
2015	6.68	9	74.22
2016	6.68	9	74.22
2017	6.69	9	74.33
2018	6.70	9	74.44
2019	6.70	9	74.44
2020	6.71	9	74.55
2021	6.71	9	74.55
2022	6.72	9	74.67
2023	6.73	9	74.78

If the estimated flow trends discussed in **Section 3.2**, and **Table 4-1** continue as predicted, the WEDWRF will not exceed the permitted capacity in the next 50 years.

4.2 Recommendations for Expansion

As discussed in **Section 3.2** the estimated AADF by the year 2023 will be approximate 6.52 MGD. This is equivalent to 72 percent (%) of the WEDWRF permitted capacity. Given the current annual projected population increase of approximately 0.1% per year, no increase in plant capacity is currently needed. Therefore there are no recommendations or schedule for expansion provided herein.