

# **2007 Effluent Generation Report**



**We can't  
afford to waste  
a single drop**



**Pima County  
Regional Wastewater Reclamation Department**

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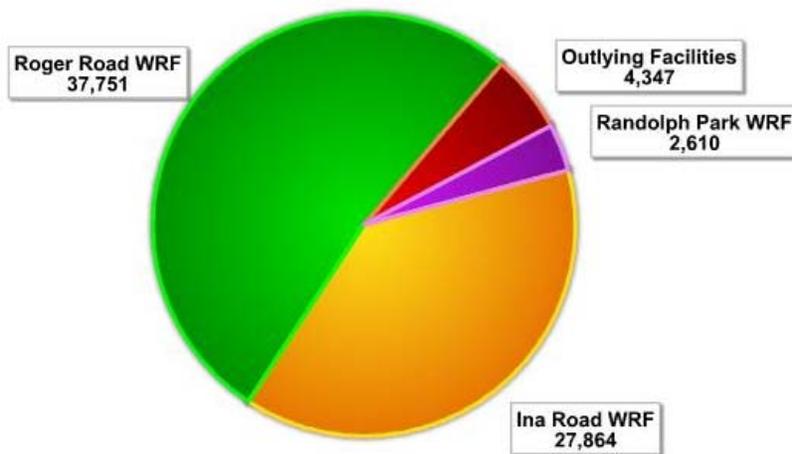
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## I. Executive Summary

The Pima County Regional Wastewater Reclamation Department, along with partnering utilities and organizations, is dedicated to protection of public health and the environment for future generations. These commitments are reflected in the increased usage of reclaim water throughout the community thereby decreasing the demands upon potable water systems and sustaining groundwater levels.

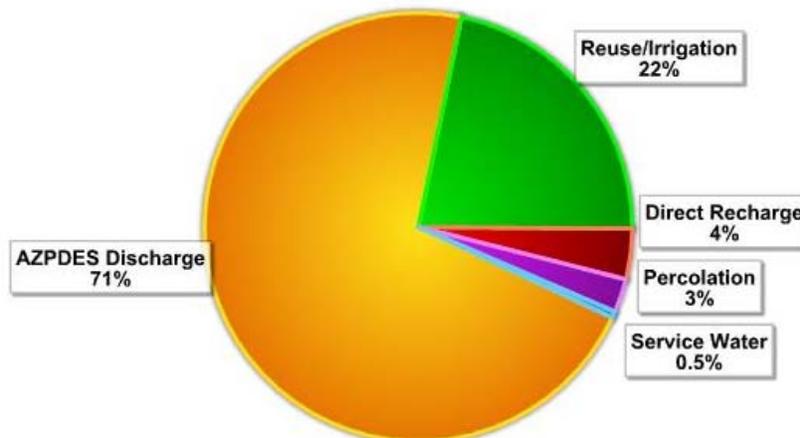
During calendar year 2007, RWRD produced a total of 72,614.5 acre feet of effluent. 68,268 AF was generated at the metropolitan facilities and an additional 4,347 AF generated at the remaining outlying facilities. Ina Road WRF, Roger Road WRF and Randolph Park WRF represent the metropolitan facilities identified by the 1979 IGA.

**Figure 1. 2007 Effluent Generation by Facility (Acre-Feet)**



Effluent generated at these facilities is utilized in a variety of beneficial uses including irrigation, dust control, groundwater recharge and industrial reuse. The remainder of effluent is disposed of through surface water discharges under the authorization of an AZPDES permit.

**Figure 2. 2007 Combined Effluent Utilization by Activity**



Based on the 1979 Intergovernmental Agreement (IGA) between the City of Tucson and Pima County, 68,217.8 AF of effluent was distributed from the metropolitan facilities with 36,016 AF going to the city of Tucson and 4,001.8 AF going to Pima County.

For 2007, Pima County will receive 592.6 AF of managed recharge credits for its share of effluent discharged into the Lower Santa Cruz Managed Recharged Project (LSCMRP) and an additional 184.1 AF for the Marana High Plains Effluent Recharge Project (MHPERP). This report details the allocation of effluent among the water providers in the community and how Pima County's effluent is used.

This report provides a narrative description of the different wastewater treatment processes used at each facility and the quantity of water produced at each facility. This report also provides information regarding how effluent was allocated and utilized throughout the community.

## II. Regional Wastewater Reclamation Facilities

### A. Metropolitan Facilities

#### *Ina Road Water Wastewater Reclamation Facility*

The Ina Road WRF located in the northwestern part of the Tucson basin and serves the northwest portions of Tucson, Oro Valley and Marana. The original facility was constructed in 1979 as a 25 MGD, Class B, high-purity oxygen activated sludge process. Capacity at this facility was increased in 2006 with the addition of a 12.5 MGD, Biological Nutrient Removal Activated Sludge process producing Class B+ effluent thereby increasing the overall combined plant capacity to 37.5 MGD. Chlorination is the disinfection method used at this facility.

Effluent from this facility is discharged into the Santa Cruz River under the authorization of an AZPDES permit and for dust control under a Type II Re-Use permit. Effluent discharged into the Santa Cruz River is conveyed to the Lower Santa Cruz Managed Recharge Project (LSCMRP) where recharge credits are issued from the Arizona Department of Water Resources (ADWR) for the recharging and storage of effluent.

Source	Description	Volume AF/Year	Volume MG/Year
Influent Volume	Influent Received	28,840.61	9,397.74
AZPDES Discharge	Santa Cruz River	27,856.26	9,076.99
Reuse Discharge	Construction and dust control	8.02	2.61
Process Water	Industrial usage on-site	13.32	4.34

#### *Roger Road Wastewater Reclamation Facility*

The Roger Road WRF is located on the west side of Tucson and serves the greater Tucson metropolitan area. This is currently RWRD's largest facility with a capacity of 41 MGD and utilizes chlorination for disinfection. Effluent from this facility is discharged into the Santa Cruz River under the authorization of an AZPDES permit, used for on-site irrigation and delivered to the City of Tucson for both recharge and use in the City of Tucson's Reclaimed Water System.

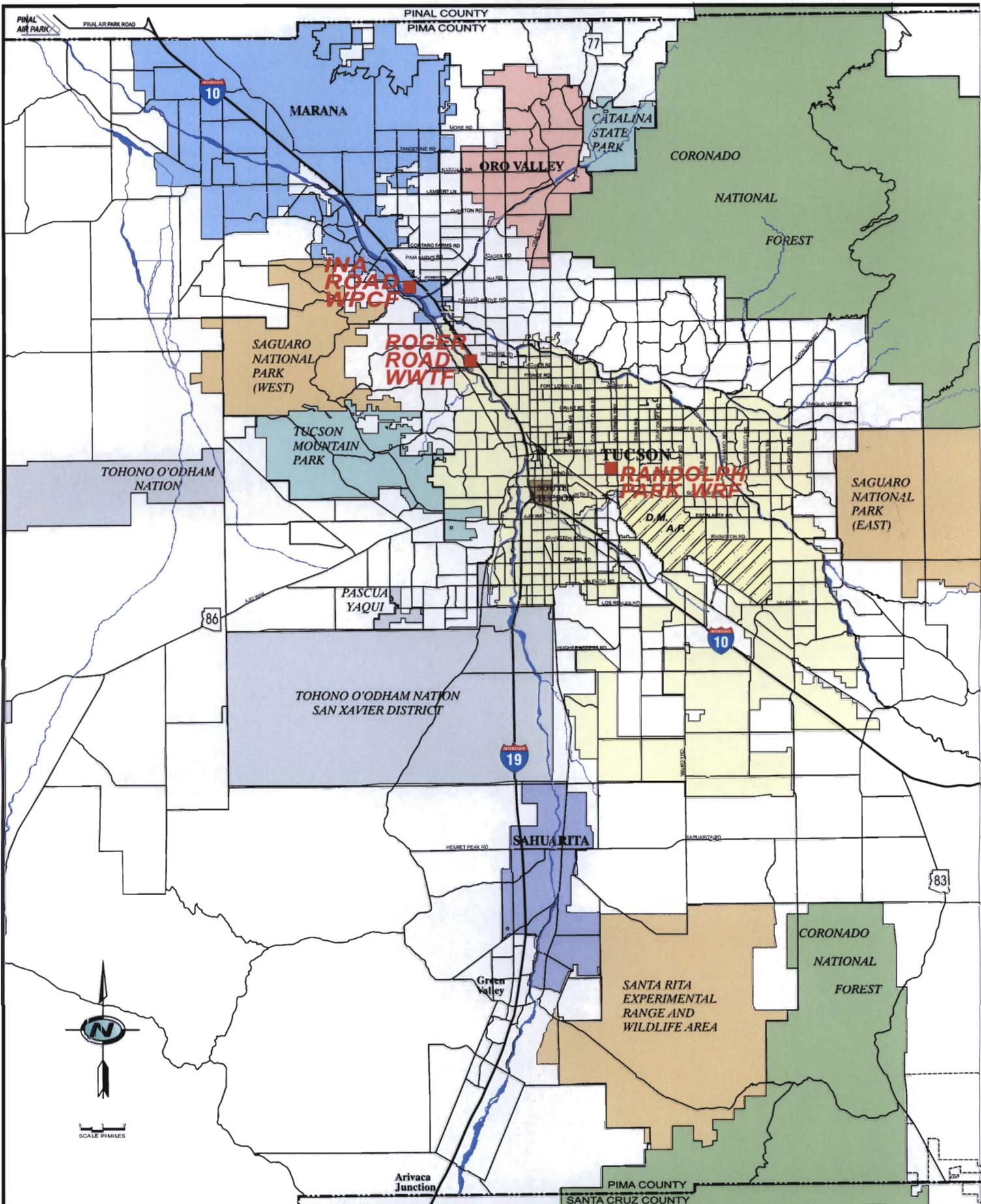
Source	Description	Volume AF/Year	Volume MG/Year
Influent Volume	Influent Received	40,730.70	13,272.14
AZPDES Discharge	Santa Cruz River	24,494.88	7,981.68
Reuse Discharge	City of Tucson (Sweetwater)	13,195.6	4,299.80
Reuse On-site	Irrigation	60.09	19.68
Process Water	Biosolids flush water	233.39	76.09

**Randolph Park Wastewater Reclamation Facility**

The Randolph Park WRF is located in midtown Tucson at the City-owned Randolph Park. This is a 3.0 MGD membrane bioreactor facility and utilizes ultraviolet light disinfection system. This facility produces Class A+ effluent that is delivered into the City of Tucson's Reclaimed Water System.

<b>Source</b>	<b>Description</b>	<b>Volume AF/Year</b>	<b>Volume MG/Year</b>
Influent Volume	Influent Received	2,866.52	934.06
Reuse Discharge	City of Tucson Reclaim System	2,610.4	850.6
Reuse On-site	Irrigation	0.45	0.15
Process Water	Industrial usage on-site	42.75	13.93

**B. Metropolitan Facilities Map (continued on next page)**



PIMA COUNTY  
WASTEWATER MANAGEMENT  
DEPARTMENT



PROJECT:  
**EFFLUENT UTILIZATION**

TITLE:  
**METROPOLITAN  
FACILITIES**

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DATE:  
MAY 2008

FIGURE:  
A

**C. Metropolitan Facilities Historical Data**

**Historical Influent and Effluent Utilization/Discharge by Metropolitan Treatment Facility**

	<b>Influent Received (AF/YR)</b>	<b>Effluent Utilized County Facilities (AF/YR)</b>	<b>Effluent Discharged/Delivered (AF/YR)</b>	<b>Effluent Utilized (AF/YR)</b>
Ina Road				
2003	27,071.5	806.9	26,407.6	27,214.5
2004	28,714.7	605.6	27,925.5	28,531.1
2005	26,149.8	665.7	24,552.1	25,217.8
2006	25,854.4	613.2	24,968.1	25,581.3
2007	28,840.6	8.02	27,856.3	27,864.3

Roger Road				
2003	41,991.9	119.7	40,862.2	40,981.9
2004	40,957.0	599.0	39,025.8	39,624.8
2005	43,239.0	13.6	42,311.5	42,325.1
2006	43,381.2	63.0	40,864.8	40,927.8
2007	40,730.7	60.1	37,690.5	37,750.6

Randolph Park				
2003	1.4	1.4	0.0	1.4
2004	114.7	0.0	97.5	97.5
2005	1,579.6	408.4	1,055.9	1,464.3
2006	2,785.4	679.5	1,878.5	2,558.0
2007	2,866.5	43.21	2,610.4	2,653.6

Metropolitan Facility Totals				
2003	69,064.8	927.9	67,269.9	68,197.8
2004	69,786.4	1,204.6	67,048.8	68,253.4
2005	70,968.4	1,087.7	67,919.5	69,007.2
2006	72,021.0	1,355.7	67,711.4	69,067.1
2007	72,437.8	111.3	68,157.2	68,268.5

	<b>County Share Effluent (AF/YR)</b>	<b>County Storage Credits (AF/YR)</b>	<b>Cumulative Credits (AF/YR)</b>
2003	3,999.8	58.1	58.1
2004	4,005.3	449.0	507.1
2005	4,080.7	535.0	1,042.1
2006	4,086.7	532.0	1,574.1
2007	4,001.8	776.7	2,350.8

**D. Non-Metropolitan Facilities*****Arivaca Junction Wastewater Reclamation Facility***

The Arivaca Junction WRF is located in the town of Amado, approximately 30 miles south of Tucson. It is made up of a single 3.2-acre aerated lagoon with a permitted treatment capacity of 100,000 gallons per day (GPD) and utilizes chlorination as the method of disinfection. Effluent disposal is via evaporation, percolation, and reuse. Evaporation ranges from 7,000 to 14,000 GPD, while percolation is approximately 10,000 GPD. RWRD has a reuse agreement with Reventone Ranch to accept delivery of Class C effluent for restricted agriculture use.

Source	Description	Volume AF/Year	Volume MG/Year
Influent Volume	Influent Received	74.32	24.22
Reuse Discharge	Reventone Ranch	41.96	13.67

***Avra Valley Wastewater Reclamation Facility***

The Avra Valley WRF is located on the west side of the Tucson Mountains, approximately 20 miles southwest of Tucson. The facility is a 2.2 MGD oxidation ditch for achieving both nitrification and denitrification and utilizes chlorination as the method of disinfection. Effluent produced at this facility is Class B+ and is disposed of by percolation, irrigation and dust control reuse and through a surface water discharge to the Black Wash under an AZDPES permit.

Source	Description	Volume AF/Year	Volume MG/Year
Influent Volume	Influent Received	1,368.76	446.01
Percolation	Percolation beds and ponds	1,352.04	440.56
Reuse	Irrigation and dust control	203.64	66.36*
Process Water	Industrial usage on-site	51.37	16.74
AZPDES Discharge	Black Wash Sprayfield	2.07	0.67

\*\* The flow meter at this location is in error. Actual results are lower but cannot be quantified. This problem was addressed and corrected the 4<sup>th</sup> quarter of 2007.

***Pima County Fairgrounds Wastewater Reclamation Facility***

The Pima County Fairgrounds WRF is located approximately 18 miles southeast of Tucson and serves the fairgrounds complex. This facility has a permitted capacity of 20,000 GPD. Effluent at this facility is disposed of through both percolation and evaporation.

Source	Description	Volume AF/Year	Volume MG/Year
Influent Volume	Influent Received	1.33	0.43

### ***Corona de Tucson Wastewater Reclamation Facility***

The Corona de Tucson WRF is located 22 miles southeast of Tucson. The facility consists of a recently constructed 1.0 MGD closed loop oxidation ditch for achieving both nitrification and denitrification. This facility produces Class B effluent which is disposed of in a lined 11-acre evaporative pond and via recharge. Soil aquifer treatment (SAT) is the method of disinfection.

<b>Source</b>	<b>Description</b>	<b>Volume AF/Year</b>	<b>Volume MG/Year</b>
Influent Volume	Influent Received	228.94	74.60
Reuse	SAT Recharge	144.76	47.17

### ***Green Valley Wastewater Reclamation Facility***

The Green Valley WRF is located approximately 15 miles south of Tucson and serves the town of Green Valley. This facility is comprised of two treatment trains. The first consists of a 2.0 MGD oxidation ditch for achieving both nitrification and denitrification and is capable of producing Class A+ effluent. Effluent from this facility is used for groundwater recharge after delivery to Robson/Quail Creek Inc. Chlorination is the method of disinfection.

The second treatment train consists of a separate 2.1 MGD aerated lagoon treatment facility producing Class B effluent. Effluent from this facility is disposed of through percolation.

<b>Source</b>	<b>Description</b>	<b>Volume AF/Year</b>	<b>Volume MG/Year</b>
Influent Volume	Influent Received	1,999.83	651.64
Reuse from BNROD	Robson/Quail Creek	1,878.78	612.20
Lagoon facility	Percolation Ponds	507.47	165.36

### ***Marana Wastewater Reclamation Facility***

The Marana WRF is located to the northwest of Tucson in the Town of Marana. This facility consists of a 0.5 MGD Biolac treatment process and four, 50,000 GPD Smith & Loveless package treatment facilities. Chlorination is the method of disinfection. This facility is capable of treating a combined capacity of 0.7 MGD, Class B+ effluent. Effluent from this facility is used for landscape irrigation in a riparian habitat and through a surface water discharge to the Santa Cruz River under an AZPDES permit.

<b>Source</b>	<b>Description</b>	<b>Volume AF/Year</b>	<b>Volume MG/Year</b>
Influent Volume	Influent Received	229.40	74.75
AZPDES Discharge	Discharge to Santa Cruz River	188.06	61.28
Reuse	Irrigation on-site	25.27	8.23
Process Water	Industrial usage on-site	6.66	2.17

### ***Mt. Lemmon Wastewater Reclamation Facility***

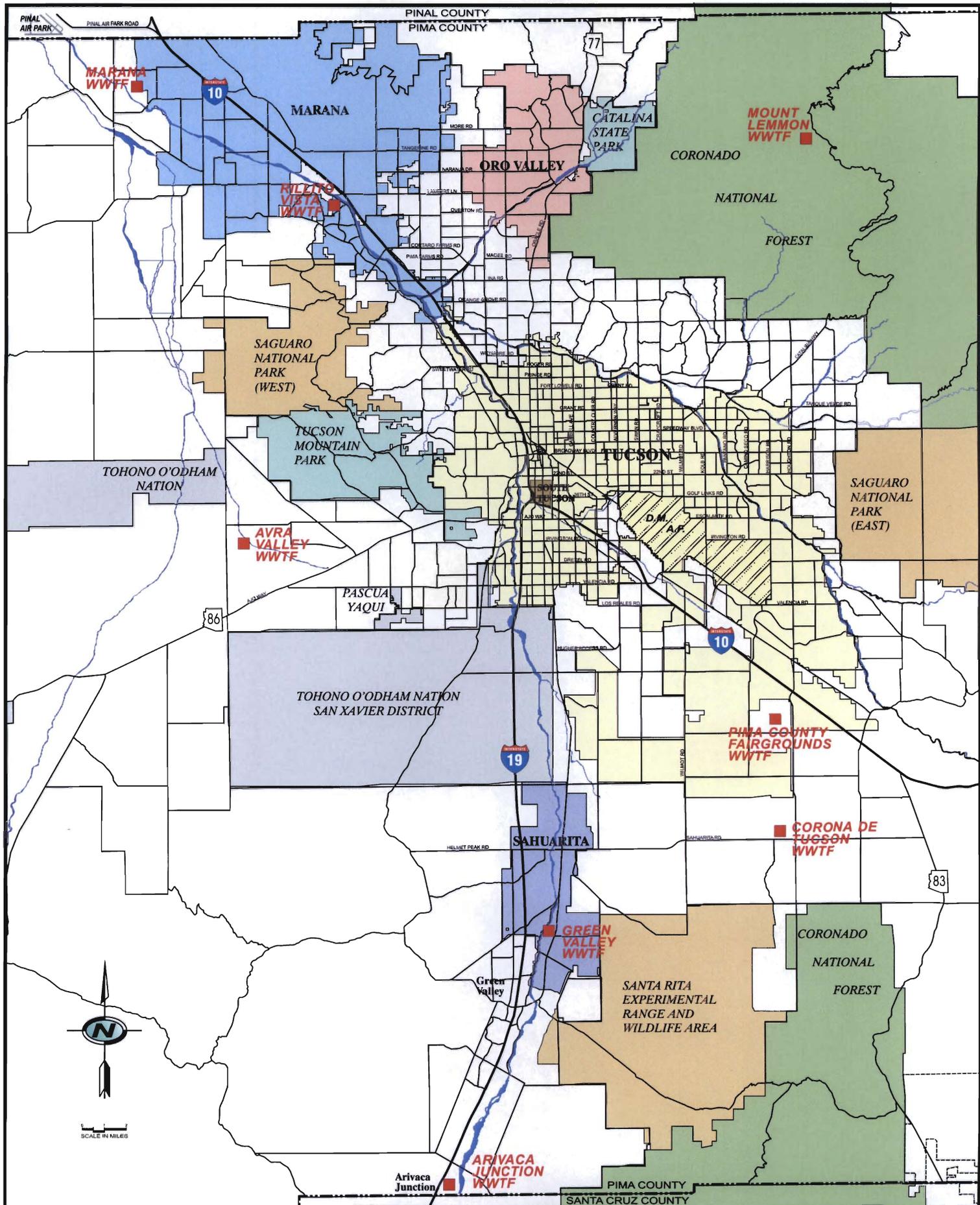
The Mt. Lemmon WRF is located in the Town of Summerhaven in the Catalina Mountains. This facility operates under a special use permit issued by the United States Forest Service (USFS) that authorizes a treatment capacity of 17,000 gallons per day. This facility consists of a closed loop oxidation ditch for achieving both nitrification and denitrification. Effluent is disposed of through an off-site spray field and through a surface water discharge to the San Pedro River under an AZPDES permit.

<b>Source</b>	<b>Description</b>	<b>Volume AF/Year</b>	<b>Volume MG/Year</b>
Influent Volume	Influent Received	2.81	0.91
Reuse Discharge	Discharge to Santa Cruz River	2.62	0.85

### ***Rillito Vista Wastewater Reclamation Facility***

The Rillito Vista WRF is located to the north of the Town of Marana. This facility consists of two stabilization/evaporation/percolation ponds with a maximum capacity of 20,000 GPD. This facility is designed for evaporation and percolation.

<b>Source</b>	<b>Description</b>	<b>Volume AF/Year</b>	<b>Volume MG/Year</b>
Influent Volume	Influent Received	13.87	4.62



**PIMA COUNTY  
WASTEWATER MANAGEMENT  
DEPARTMENT**



PROJECT:  
**EFFLUENT UTILIZATION**

TITLE:  
**NON-METROPOLITAN  
FACILITIES**

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MAY 2008

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### III. Reclaim Effluent Utilization

#### A. Natural Resources, Parks and Recreation

##### Natural Resources, Parks and Recreation Monthly Reclaimed Water Usage For Calendar Year - 2007

Month	Gallons/Month	Ccf/Month	Cost	AF/Month	Cost/AF
January	6,918,252.0	9,249.0	1,294.90	21.2	60.99
February	6,828,492.0	9,129.0	1,278.10	21.0	60.99
March	18,780,784.0	25,108.0	3,515.23	57.6	60.99
April	22,285,164.0	29,793.0	4,171.15	68.4	60.99
May	29,051,572.0	38,839.0	5,437.62	89.2	60.99
June	39,084,496.0	52,252.0	7,315.50	119.9	60.99
July	41,585,060.0	55,595.0	7,783.54	127.6	60.99
August <sup>(a)</sup>	25,278,660.0	33,795.0	5,495.58	77.6	70.84
September	30,524,384.0	40,808.0	6,636.00	93.7	70.84
October	16,859,920.0	22,540.0	3,665.35	51.7	70.84
November	37,504,720.0	50,140.0	8,153.53	115.1	70.84
December	20,866,956.0	27,897.0	4,536.48	64.0	70.84
<b>Total <sup>(b)</sup></b>	<b>295,568,460.0</b>	<b>395,145.0</b>	<b>59,283.0</b>	<b>907.1</b>	

(a) Billing rate was changed in the middle of the billing cycles.

(b) Arthur Pack is now included as a part of total volume used for all parks.

##### Yearly Reclaimed Water Usage

Year	Gallons/Year	Ccf/Year	Cost	AF/YR
2003	69,569,188.5	93,006.9	Not available	213.5
2004	86,112,707.1	115,123.9	73,165.5	264.3
2005	74,344,468.0	99,391.0	61,097.0	228.2
2006	92,815,580.0	124,085.0	17,973.0	284.8
2007	295,568,460.0	395,145.0	59,283.0	907.1

SOURCE: Metered data provided by City of Tucson

**B. Ed Pastor Kino Environmental Restoration Project**

**Kino Sports Complex  
Monthly Reclaimed Water Usage  
For Calendar Year - 2007**

Month	Gallons/Month	Ccf/Month	Cost	AF/Month	Cost/AF
January	0.0	0.0	0.00	0.0	60.99
February	2,932,908.0	3,921.0	548.96	9.0	60.99
March	0.0	0.0	0.00	0.0	60.99
April	829,532.0	1,109.0	155.26	2.5	60.99
May	7,539,840.0	10,080.0	1,411.24	23.1	60.99
June	14,891,184.0	19,908.0	2,787.20	45.7	60.99
July	18,338,716.0	24,517.0	3,986.84	56.3	70.84
August	3,108,688.0	4,156.0	675.83	9.5	70.84
September	1,687,488.0	2,256.0	366.86	5.2	70.84
October	1,181,092.0	1,579.0	256.77	3.6	70.84
November	338,096.0	452.0	73.50	1.0	70.84
December	1,055,428.0	1,411.0	229.45	3.2	70.84
<b>Total</b>	<b>51,902,972.0</b>	<b>69,389.0</b>	<b>10,491.91</b>	<b>159.3</b>	

SOURCE: Metered data provided by City of Tucson

\*\*The total volume recorded via the Tucson Water SCADA data source indicates a volume of 30,710,000 gallons, or 94.25 AF, for 2007. This discrepancy is currently being audited.

**Historical Reclaimed Water Usage**

Year	Gallons/Year	Ccf/Year	Cost	AF/YR
2003	116,720,000.0	156,042.8	Not available	358.0
2004	107,504,804.0	143,723.0	189,281.0	329.9
2005	58,712,764.0	78,493.0	113,362.2	180.2
2006	128,622,340.0	171,955.0	25,435.9	394.7
2007	51,902,972.0	69,389.0	10,491.9	159.3

**Reclaimed/Harvested by Year**

Year	Reclaimed	Harvested	Total Irrigation
	AF/YR	AF/YR	AF/YR
2003	87.0	358.0	445.0
2004	329.9	30.7	360.6
2005	180.2	64.9	245.1
2006	394.7	0	394.7
2007	159.3	65.95	225.25

### C. Marana High Plains Effluent Recharge Project

#### Marana HPERP Recharge Volumes For Calendar Year - 2007

Month	Total Inflow (AF)	Calculated Evaporation (AF)	Calculated ET (AF)	Net Recharge (AF)	County Credits (AF)
January	59.08	0.53	0.24	58.32	
February	23.74	0.522	0.113	23.10	
March	22.56	0.706	0.767	21.09	
April	18.86	0.58	0.33	17.95	
May	16.95	0.91	1.15	14.88	
June	47.66	2.26	1.18	44.22	44.2
July	25.36	1.99	0.52	22.85	22.85
August	0	0	0	0	0
September	5.31	0.08	0.09	5.14	5.14
October	41.56	0.51	0	41.06	41.06
November	38.38	0.5	0.35	37.53	37.53
December	33.68	0.18	0.16	33.34	33.34
<b>Total</b>	<b>333.14</b>	<b>8.768</b>	<b>4.9</b>	<b>319.48</b>	<b>184.12</b>

\*\*\*A recharge and underground storage permit was issued to Pima County effective June 1, 2007 thereby making Pima County eligible for receipt of recharge credits.

SOURCE: Pima County Regional Flood Control District

#### IV. Effluent Entitlements

### Effluent from the Metropolitan Treatment Facility for Calendar Year 2007

Treatment Facilities	Influent Received (AF/YR)(a)	Effluent Utilized County Facilities (AF/YR)	Effluent Discharged/Delivered (AF/YR)	Effluent Utilized (AF/YR)
Ina Road WRF	28,840.6			
-Plant Irrigation		8.0		
-Santa Cruz Discharge			27,856.3	
<b>Ina Road WRF Total</b>	<b>28,840.6</b>	<b>8.0</b>	<b>27,856.3</b>	<b>27,864.3</b>
Roger Road WRF	40,730.7			
-Plant Irrigation		60.1		
-Santa Cruz Discharge			24,494.9	
-Sweetwater (Water Providers)			13,195.6	
<b>Roger Road WRF Total</b>	<b>40,730.7</b>	<b>60.1</b>	<b>37,690.5</b>	<b>37,750.6</b>
Randolph Park WRF	2,866.5		2,610.40	
-Plant Irrigation		0.46		
<b>Randolph Park WRF Total</b>	<b>2,866.5</b>	<b>0.46</b>	<b>2,610.4</b>	<b>2610.86</b>
<b>County Usage</b>				
-Natural Resources, Parks and Recreation		907.2		
-KERP <sup>(b)</sup>		159.3		
<b>Cumulative Totals</b>	<b>72,437.8</b>	<b>1,135.1</b>	<b>68,157.2</b>	<b>68,217.8</b>
SAWRSA <sup>(c)</sup>				28,200.0
Total Less SAWRSA				40,017.8
Water Providers Factorial				0.9
Pima County Factorial				0.1
<b>Entities Share</b>				
-Water Providers (90%)				36,016
-Pima County (10%)				<b>4,001.8</b>

(a) Acre feet per year (AF/YR) = Million Gallons per Year (MGY) divided by 325,851 gallons (the equivalent of one AF).

(b) KERP - Ed Pastor Kino Environmental Restoration Project

(c) SAWRSA - Southern Arizona Water Rights Settlement Act

***1979 Intergovernmental Agreement, Resolution No. 1979 - 78***

The 1979 Intergovernmental Agreement, signed on June 26, 1979, was the original agreement between Pima County (PC) and the City of Tucson (COT). This agreement assigned control of wastewater conveyance and treatment activities to Pima County Regional Wastewater Reclamation Department (RWRD). In exchange, the COT would receive 90% of all effluent produced at the RWRD metropolitan sites, which were limited to Ina Road WRF and Roger Road WRF.

***City of Tucson – Pima County Supplemental Intergovernmental Agreement Relating to Effluent, Resolution No. 2000-28***

The 2000 Supplemental Intergovernmental Agreement, signed on February 8, 2000, placed restrictions on how PC could use effluent. This agreement also exempted outlying treatment facilities from the City control, identified the need for reopening the Randolph Park WRF, and provided an avenue for the County to deliver County effluent to County facilities. This supplemental agreement also established a Conservation Effluent Pool for use with riparian habitat projects and identified how the Southern Arizona Water Rights Settlement Act (SAWRSA) volumes are to be treated in determining effluent allocations.

***Conservation Effluent Pool Agreement***

The Conservation Effluent Pool (CEP), which is a specific quantity of effluent that can be used for conservation projects, was identified in the 2000 Supplemental Intergovernmental Agreement. However, the implementation of the use of this pool requires a separate agreement, which is currently being negotiated with the City of Tucson.

***Intergovernmental Agreement between the City of Tucson and Pima County for Treating Effluent and Wheeling Reclaimed Water (Wheeling Agreement), Resolution No. 2003-286***

The Wheeling Agreement, signed December 16, 2003, governs reclaimed water transactions between RWRD (the effluent provider), COT (the distributor and a reclaimed water user) and other County facilities (reclaimed water users). Effluent enters the system at the COT Sweetwater Plant and through direct delivery from the Randolph Park WRF, where it is piped to various locations. The agreement governs the costs per acre foot that will be charged to PC for distribution of PC effluent to County sites.

***Intergovernmental Agreement – Permitting and Operating Managed In-Channel Recharge of Effluent in the Santa Cruz River Channel (Managed Recharge IGA 2003)***

The Managed Recharge IGA 2003 governs the recharge of effluent and the associated credits made available from recharging effluent into LSCMRP (Lower Santa Cruz Managed Recharge Project) between the Ina Road WRF and Trico Road in Marana. Participants include the Town of Marana, Cortaro-Marana Irrigation District, Avra Valley Irrigation District, Metropolitan Domestic Water Improvement District, Flowing Wells Irrigation District, Oro Valley, Pima County, and the City of Tucson.