

**MASTER WASTEWATER REPORT
FOR
DEVELOPMENT UNIT 3/4
AT
EASTMARK**

May 14, 2014
WP# 113697.09

CITY OF MESA
APPROVED
Date 5/20/14 BY RAP

REVIEWED BY
CITY STAFF
5/16/14 BY
DATE

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FOR
DEVELOPMENT UNIT 3/4
AT
EASTMARK**

May 14, 2014
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| | | |
|--|---------------------------------|------------------|
| DMB* | Master Developer Approval | EASTMARK. |
|  | Date | 05/15/14 |
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EXPIRES 06-30-2015

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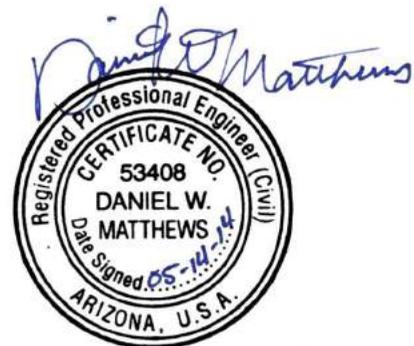
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EXPIRES 06-30-2015

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1.0 INTRODUCTION

1.1 General Background and Project Location

The proposed Development Unit 3/4 is anticipated to be an approximate 608-acre Development Unit (DU) within the 3,151-acre Eastmark master planned community in the City of Mesa (City). It is a Planned Community District (PCD) which is a mixed-use development that will include single-family residential, multi-family residential, urban mixed-use, commercial mixed-use, industrial, office, hotel, resort, golf, various community uses, and open spaces.

This Master Wastewater Report has been prepared in accordance with Wood, Patel & Associates, Inc. (Wood/Patel's) understanding of the City's technical requirements for wastewater collection systems as applicable for Eastmark.

The Site is located within Sections 15, 22, and 23, Township 1 South, Range 7 East of the Gila and Salt River Meridian. The Site is bounded by Ray Road to the south (from Ellsworth Road to Inspirian Parkway), Inspirian Parkway on the east (from Ray Road to Point Twenty-Two Boulevard), Point Twenty-Two Boulevard on the south (from Inspirian Parkway to Eastmark Parkway), Eastmark Parkway on the east (from Point Twenty-Two Boulevard to Warner Road), Warner Road on the north, and Ellsworth Road on the west (refer to Plate 1 – *Vicinity Map*).

1.2 Scope of the DU 3/4 Master Wastewater Report

The DU 3/4 Master Wastewater Report presents wastewater design flows, and sewer main sizes and locations as required to provide wastewater service to the Site. The purpose of this report is to provide a sewer analysis reflecting the developed condition of DU 3/4 prior to the full build-out of Eastmark, based on the land uses provided by DMB Mesa Proving Grounds, LLC, and to identify the sewer infrastructure required to serve the Site, while meeting the requirements of the City's Engineering and Design Standards.

Updates to the DU 3/4 Master Wastewater Report may be required if significant changes are made to the land uses and assumptions utilized to prepare this report. Additionally, design criteria may change based on actual wastewater generation to calculate demand on the system in the future.

1.3 Wastewater Master Report for Eastmark

The *Master Wastewater Report Update for Eastmark*, by Wood, Patel & Associates, Inc., dated December 17, 2013 was approved by the City of Mesa. Additionally, the *Master Wastewater Report Update for Eastmark*, by Wood, Patel & Associates, Inc. dated May 14, 2014, is being submitted concurrently for review and approval to the City of Mesa to incorporate changes within DU 3/4 and DU 5E. The report sets the design criteria required within Eastmark, and sets sewer basin boundaries tributary to the Elliot Road, Warner Road, and Ray Road offsite sewers. The updated report includes revised land uses and sewer alignments across Eastmark.

1.4 Study Area and Development Units

The study area includes the Ray Road and Warner Road Sewer Drainage Basins, per the *City of Mesa Wastewater Master Plan Update, 2009*. For a detailed breakdown of modeled land use areas, please refer to the following:

- Table 2 – *Overall Eastmark Modeled Land Use*
- Table 3 – *DU 3/4 Modeled Land Use*
- Table 4 – *DU 3/4 Wastewater Model*
- Plate 2 – *DU 3/4 Master Sewer Exhibit*

1.5 Basis of Design Reports for Specific Individual Developments

As development progresses within the Site, Basis of Design (BOD) reports are required for specific individual developments to ensure compliance with the Master Report and this Development Unit Master Report, and to identify significant variations in land use, wastewater flows, and the wastewater infrastructure needed to serve the parcel.

2.0 EXISTING CONDITIONS

2.1 Topographic Conditions

The Site consists of multiple automotive test tracks and undisturbed desert, which borders the Site to the west, north, and the north half of the eastern boundary. Along the south half of the eastern boundary, DU 7 is under construction. To the south, the Site is bound by the Powerline Floodway and Ray Road. The land generally slopes in a southwesterly direction, at approximately 0.5 to 1 percent. The peak elevation within the Site is approximately 1,425 feet above mean sea level (MSL), located along Inspirian Parkway, north of Ray Road. The lowest elevation within the Site is approximately 1,390 feet MSL, located at the southwest corner of DU 3/4. Refer to Plate 1- Vicinity Map for roadway alignments.

2.2 Existing Offsite Wastewater Infrastructure

Existing public wastewater infrastructure in the vicinity of the Site includes the following:

- An existing 12-inch gravity sewer located along Mountain Road, between Elliot Road and Pecos Road.
- An existing 12-inch gravity sewer located along Signal Butte Road, between Elliot Road and Galveston Road.
- An existing 18-inch dry gravity sewer located along Warner Road, within the Loop 202 Freeway right-of-way.
- The East Mesa Interceptor (EMI), which is approximately two and one-half (2 ½) miles west of the Site, is an existing 54-inch and 66-inch gravity sewer line extending in a southerly direction parallel with the East Maricopa Floodway.
- A 27-inch and 30-inch gravity sewer located along Ray Road, flowing east from Ellsworth Road discharging to the EMI, and a 21-inch and 18-inch gravity sewer between Ellsworth Road and Signal Butte Road.
- A 24-inch gravity sewer line in Elliot Road, beginning just west of Signal Butte Road to the EMI at Ellsworth Road and Elliot Road.

3.0 WASTEWATER SYSTEM DESIGN

3.1 Design Criteria

Wastewater design flows and pipe-sizing criteria utilized in this DU 5E Master Wastewater Report are based on Wood/Patel’s understanding of the following:

- The *Master Wastewater Report for Eastmark*.
- Applicable wastewater system design criteria listed in the *2012 City of Mesa Engineering Design Standards*, along with City accepted population based criteria per Table 1 – *DU 3/4 Wastewater Design Criteria*.
- Regionally-accepted design standards.
- Title 18, Chapter 9 of the *Arizona Administrative Code*.

Table 1 presents the Unit Daily Wastewater Flow for each land use category based on density and population.

3.2 Wastewater Design Flows

Estimated wastewater design flows under full build-out conditions were estimated for DU 3/4 based on design criteria listed above and planned land uses. Projected full build-out average day wastewater flows for DU 3/4 and the existing development within Eastmark including the First Solar retrofit site and DU 7 are summarized as follows in millions of gallons per day (MGD):

| | DU 3/4 Flows | Offsite Eastmark Flows | Total Eastmark Flows |
|----------------------|-----------------|---------------------------|-------------------------|
| Elliot Road Outfall: | 0.00 MGD | 3.96 MGD | 3.96 MGD |
| Warner Road Outfall: | 0.10 MGD | 0.00 MGD | 0.10 MGD |
| Ray Road Outfall: | 2.49 MGD | 0.87 MGD | 3.36 MGD |
| Total: | 2.59 MGD | 4.83 MGD | 7.42 MGD |

Sewer pipe capacities are based upon conveying the flow at two-thirds of the pipe capacity. It is Wood/Patel's understanding that wet-weather infiltration is accounted for within the City of Mesa peaking factors listed in the 2012 City of Mesa Engineering Design Standards.

An additional scenario was analyzed in this report to evaluate pipe sizes during a peak wet-weather wastewater flow, while a 450-000-gallon pool is drained at a rate to empty within 8 hours (938 gpm) downstream of the proposed Aquatic Center within DU 3/4. Results of the peak wet-weather flow analysis are shown on Table 14 – *Wastewater Model, Full Build-Out Condition*. Results show that during the peak wet-weather event, the limiting section of downstream sewer is the 15-inch line from Node R5 to Node R3, located immediately downstream of the Aquatic Center. During the peak wet-weather flows, this pipe section is flowing at 49.4 percent of the full-flow capacity with a $d/D = 0.49$. When the pool flow of 938 gpm is added to the peak wet-weather flow, the total sewer flow equals 1,891 gpm, which is 92-percent of the maximum capacity of the 15-inch sewer, and has a d/D equal to 0.80. Refer to Table 15 – *Calculated Pipe Capacities, Full Build-Out Condition* for the results, and Plate 2 – *Master Sewer Exhibit, Full Build-Out Condition* for pipe locations.

Additional detailed design flow calculations are provided in Table 4 – *DU 3/4 Wastewater Model* and Table 5 – *DU 3/4 Calculated Pipe Capacities*. Wood/Patel utilized criteria within the 2012 City of Mesa Design Standards based on static peaking methodology to calculate peak wet-weather flows for Eastmark. Static methodology is required by the City on an individual project basis to size onsite sewer lines.

It is our understanding the City utilized a diurnal peaking methodology to evaluate the overall tributary area, including Eastmark, to aid in the design of the Ray Road and Elliot Road sewers. Diurnal peaking methodology is based on observed and/or estimated daily wastewater flow cycles for comparable developed areas, and is generally less conservative than static modeling resulting in lower peak flows. As a result, the peak wet-weather flows calculated in this report for Eastmark may vary from those used in designing the Ray Road and Elliot Road sewer lines. The controlling section of the Ray Road sewer is an offsite 30-inch pipe at 0.14 percent slope. The capacity of this pipe

flowing full is 11.94 MGD, and at $d/D = 0.9$ is 12.7 MGD. Therefore, the peak wet-weather flows for Eastmark would not exceed the capacity of the Ray Road Sewer.

Additionally, it is Wood/Patel's understanding that the City of Mesa will evaluate their wastewater collection system downstream of Eastmark utilizing diurnal peaking factors to evaluate if the system has capacity to convey flows estimated within this report. If these evaluations indicate the capacity is exceeded in these lines, DMB would participate in projects necessary to provide additional capacity in these lines.

4.0 PROPOSED SYSTEM

4.1 Planned Wastewater Infrastructure

The City of Mesa's Wastewater Master Plan has four (4) sewer drainage basins within the study area of the Site, which includes the Elliot Road, Warner Road, Ray Road, and Williams Field Road Sewer Drainage Basins. The Elliot Road Basin serves DU 6 North and DU 5 East. DU 3/4 is proposed to contribute wastewater flow to the Warner Road and Ray Road Sewer Drainage Basins. Currently, the offsite Elliot Road and Ray Road sewers have been constructed downstream of Eastmark, and the Warner Road and Williams Field Road sewers have not been designed or constructed.

4.1.1 Ray Road Sewer Drainage Basin

The development east of Mountain Road discharges into an existing sewer line along Mountain Road. An existing diversion structure at Mountain Road and Ray Road allows the City to send the flows to either the Ray Road or Pecos Road Sewers. All flow north of Ray Road is currently diverted to the Ray Road Sewer, while flow from development south of Ray Road is conveyed south to Pecos Road. It is the City's intent to continue this mode of operation to provide additional capacity in the Pecos Road Sewer for future development along Pecos Road. This report considers the total design flow from the existing developments east of Eastmark for the Ray Road sewer contributing full build-out flow at this time. This upstream flow is accounted for per the *Master Wastewater Report for Ray Road Sewer between Ellsworth and Mountain Roads*, prepared by CMX, L.L.C., dated November 18, 2005.

4.2 Pipe Sizing

Proposed sewer lines for the Site were sized to accommodate peak wet-weather flow conditions for the full build-out condition. The onsite collection system includes planned sewer mains with diameters ranging from 8 inches to 27 inches. Refer to Tables 4 and 5 for wastewater models and calculated pipe capacities, and Plate 2 for the planned DU 3/4 wastewater infrastructure.

5.0 CONCLUSIONS

The Master Wastewater Report for Development Unit 3/4 at Eastmark presented herein meets City of Mesa standards and requirements, and serves as a guide for construction documents associated with the planned wastewater system. The following items highlight critical conclusions:

1. Development Unit 3/4 is anticipated to be 608 acres within the 3,155-acre Eastmark master planned community in the City of Mesa.
2. The wastewater system presented is based on the projected full build-out condition of the Site.
3. Wastewater design criteria are based on Wood/Patel's understanding of the *2012 City of Mesa Engineering & Design Standards*, regionally accepted design standards, the *Master Wastewater Report Update for Eastmark*, and Title 18, Chapter 9 of the *Arizona Administrative Code*.
4. The approximate average daily flow generated at build-out by the DU 3/4 is 2.6 MGD per Section 3.2 of this report.
5. Proposed onsite sewer mains are sized to accommodate peak wet-weather design flow for the full build-out condition.
6. The planned public wastewater collection system will outfall into the existing gravity sewer line located along Ray Road and into a proposed gravity sewer line located along Warner Road.
7. Wood/Patel's model of the proposed on-site wastewater system provides conveyance and capacity in conformance with the City of Mesa's standards and Title 18 of the *Arizona Administrative Code*.
8. The City of Mesa will evaluate their wastewater collection system downstream of Eastmark utilizing diurnal peaking factors to evaluate if the system has capacity to convey flows estimated within this report. If these evaluations indicate capacity is exceeded in these lines, DMB would participate in projects necessary to provide additional capacity in these lines.

TABLE 1

DU 3/4 Wastewater Design Criteria

Project: DU 3/4 at Eastmark
 Location: Mesa, Arizona
 References: 2012 City of Mesa Engineering Design Standards and City of Mesa Approved Population Based Criteria

Proj. Number: 113897.09
 Proj. Engineer: Dan Matthews, P.E.

| UNIT DAILY RESIDENTIAL WASTEWATER FLOWS | | | | | | | | | | |
|---|---|-----------------------|-----------|--------------------|-------------|--------------------------------------|-------------|-----------------------------|--------|---|
| LAND USE CATEGORY | LAND USE | DWELLING UNIT DENSITY | | POPULATION DENSITY | | WASTEWATER DESIGN FLOWS (PER CAPITA) | | UNIT DAILY WASTEWATER FLOWS | | NOTES |
| | | Value | Units | Value | Units | Value | Units | Value | Units | |
| LDR-1 | Low Density Residential (LDR 0-1) | 0.6 | DU / Acre | 2.5 | Persons/ DU | 80 | GPD/ Person | 200 | GPD/DU | Source: Dwelling unit density divisions are based on City of Mesa 2025 General Plan. Unit wastewater flows are based on the City of Mesa 2012 Engineering and Design Standards. |
| LDR-2 | LDR 0-1 & LDR 1-2 AVG. | 1 | DU / Acre | 2.5 | Persons/ DU | 80 | GPD/ Person | 200 | GPD/DU | |
| LDR-3 | Low Density Residential (LDR 1-2) | 1.2 | DU / Acre | 3.0 | Persons/ DU | 80 | GPD/ Person | 240 | GPD/DU | |
| MDR-1 | Medium Density Residential (MDR 2-4) | 3.0 | DU / Acre | 3.0 | Persons/ DU | 80 | GPD/ Person | 240 | GPD/DU | |
| MDR-2 | MDR 2-4 & MDR 4-6 AVG. | 4 | DU / Acre | 3.1 | Persons/ DU | 80 | GPD/ Person | 248 | GPD/DU | |
| MDR-3 | Medium Density Residential (MDR 4-6) | 5.0 | DU / Acre | 3.2 | Persons/ DU | 80 | GPD/ Person | 256 | GPD/DU | |
| MDR-4 | Medium Density Residential (MDR 6-10) | 6.5 | DU / Acre | 2.7 | Persons/ DU | 80 | GPD/ Person | 216 | GPD/DU | |
| HDR-1 | High Density Residential (HDR 10-15) | 11.0 | DU / Acre | 2.0 | Persons/ DU | 80 | GPD/ Person | 160 | GPD/DU | |
| HDR-2 | High Density Residential (HDR 15+) | 20.0 | DU / Acre | 1.7 | Persons/ DU | 80 | GPD/ Person | 136 | GPD/DU | |
| MUR-1 | Mixed Use/Residential (MUR) Residential | 15.0 | DU / Acre | 1.7 | Persons/ DU | 80 | GPD/ Person | 136 | GPD/DU | |

| UNIT DAILY NON-RESIDENTIAL WASTEWATER FLOWS | | | | | NOTES |
|---|--------------------|------------------------------------|--------------------------------------|--------------|---|
| LAND USE | Population Density | | WASTEWATER DESIGN FLOWS (PER CAPITA) | | |
| University - Boarded Student | --- | --- | 80 | GPD / Person | Source: City of Mesa approved population based criteria and Arizona Administrative Code, Title 18, Chapter 9. |
| University - Commuter Student and Staff | --- | --- | 40 | GPD / Person | |
| Elementary School - Student and Staff | 200 | Students and Staff / Acre | 40 | GPD / Person | |
| Middle School - Student and Staff | 100 | Students and Staff / Acre | 40 | GPD / Person | |
| Civic / Church / Library Staff | 0.4 | Employees / 1,000 S.F. | 54 | GPD / Person | |
| Civic / Church / Library Patrons | 2 | Patrons / 1,000 S.F. | 20 | GPD / Person | |
| Aquatic Center | 200 | Patrons and Staff / Acre | 10 | GPD / Person | |
| Commercial / Retail / Restaurant | 2.5 | Employees and Patrons / 1,000 S.F. | 54 | GPD / Person | |
| Office | 5 | Employees / 1,000 S.F. | 54 | GPD / Person | |
| Theater | 250 | Seats / Screen | 5 | GPD / Seat | |
| Hotel | --- | --- | 75 | GPD / Room | |
| Resort | --- | --- | 150 | GPD / Room | |

| OFFSITE | | | | | | | | | |
|-------------|---|-------|--------------------|-----------------|--------------------------------------|---------------|-----------------------------|---------|---|
| LAND USE | DWELLING UNIT DENSITY | | POPULATION DENSITY | | WASTEWATER DESIGN FLOWS (PER CAPITA) | | UNIT DAILY WASTEWATER FLOWS | | NOTES |
| | Value | Units | Value | Units | Value | Units | Value | Units | |
| CC | -- | -- | 14.0 | Employees/ Acre | 54 | GPD/ Employee | 756 | GPD/ AC | Source: City of Mesa 2009 Engineering and Design Standards and the City of Mesa 2025 General Plan |
| O | -- | -- | 23.0 | Employees/ Acre | 54 | GPD/ Employee | 1,242 | GPD/ AC | |
| RC | -- | -- | 14.0 | Employees/ Acre | 54 | GPD/ Employee | 756 | GPD/ AC | |
| BPI | -- | -- | 8.0 | Employees/ Acre | 54 | GPD/ Employee | 432 | GPD/ AC | |
| NC | -- | -- | 11.0 | Employees/ Acre | 54 | GPD/ Employee | 594 | GPD/ AC | |
| LI | -- | -- | 7.0 | Employees/ Acre | 54 | GPD/ Employee | 378 | GPD/ AC | |
| MUE | -- | -- | 15.0 | Employees/ Acre | 54 | GPD/ Employee | 810 | GPD/ AC | |
| GI | -- | -- | 15.0 | Employees/ Acre | 54 | GPD/ Employee | 810 | GPD/ AC | |
| OFFUPSTREAM | 1,040,576 GPD / 1470 Acres = 708 GPD/AC | | | | | | 708 | GPD/ AC | Source: Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads, by CMX, 11/18/2005. |

| General | Description | Value | Units | Note(s) |
|---------|---|-------|--------|---------|
| | Minimum Velocity (d/D=2/3) | 2 | ft/sec | 1 |
| | Maximum Flow Velocity (d/D=2/3) | 9 | ft/sec | 1 |
| | Maximum Peak Flow Depth-to-Diameter Ratio (d/D) | 0.67 | - | |
| | Minimum Pipe Diameter | 8 | in | 1 |
| | Manning's "n" value | 0.013 | - | 2 |
| | Peaking Factor (ADF < 1.0 MGD) | 3 | - | 1 |
| | Peaking Factor (1.0 < ADF < 10.0 MGD) | 2.5 | - | 1 |
| | Peaking Factor (10.0 < ADF < 20.0 MGD) | 2.3 | - | 1 |

- Notes:
1. Per The City of Mesa 2012 Engineering & Design Standards
 2. Title 18, Chapter 9 of the Arizona Administrative Code

TABLE 2

Overall Eastmark Modeled Land Use

WOOD/PATEL

TABLE 2 - OVERALL EASTMARK MODELED LAND USE

Project: Eastmark
Location: Mesa, Arizona

Proj. Number: 113697.09
Proj. Engineer: Dan Matthews, P.E.

EASTMARK - PRELIMINARY RESIDENTIAL LAND USE AND DWELLING UNIT BREAKDOWN

| Land Use | LDR-2 | LDR-3 | MDR-1 | MDR-2 | MDR-3 | MDR-4 | HDR-1 | HDR-2 | Residential Total | Mixed Use Residential Acres/Units | Total Residential Units |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|-----------------------------------|-------------------------|
| Acres | -- | 20.0 | 779.6 | 114.7 | 83.9 | -- | 20.0 | 228.0 | 1,246.2 | -- | --- |
| Dwelling Units | -- | 39 | 2,614 | 481 | 438 | -- | 220 | 4,559 | 8,351 | -- | 8,351 |

EASTMARK - WASTEWATER FLOW CALCULATIONS

| Development Unit | Total Area (AC) | Residential (AC) | Total Dwelling Units | Hotel/Resort Keys ⁽¹⁾ | Gross Non-Residential ⁽²⁾ (AC) | Total Floor Area (sq. ft.) | Education (AC) | Church (AC) | Civic (AC) | Other (AC) | Avg. Day Wastewater Flow (GPD) | Development Unit Flow Area (AC) | Unit Daily Wastewater Flow (GPD/AC) ⁽³⁾ |
|------------------|-----------------|------------------|----------------------|----------------------------------|---|----------------------------|----------------|-------------|-------------|--------------|--------------------------------|---------------------------------|--|
| 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 3S | 92.3 | 92.3 | 391 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 97,040 | 92.3 | 1,051.4 |
| 3A | 608.3 | 228.0 | 4,559 | 150 | 118.0 | 2,728,680 | 176.0 | 0.0 | 31.0 | 27.4 | 2,590,610 | 608.3 | 4,256.6 |
| 5E | 82.0 | -- | -- | -- | 82.0 | 1,000,000 | -- | -- | -- | -- | 800,000 | 82.0 | 9,756.1 |
| 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 6N | 272.5 | 0.0 | 0 | 0 | 272.5 | 5,380,000 | 0.0 | 0.0 | 0.0 | 0.0 | 3,157,352 | 272.5 | 11,586.6 |
| 6S | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 7 | 575.5 | 475.8 | 1,958 | 0 | 5.5 | 265,000 | 20.0 | 13.5 | 2.5 | 58.2 | 495,319 | 575.5 | 860.7 |
| 8 | 198.8 | 192.0 | 535 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 35.0 | 128,400 | 198.8 | 645.9 |
| 9 | 327.8 | 258.1 | 908 | 0 | 0.0 | 200,000 | 0.0 | 0.0 | 12.4 | 22.3 | 155,324 | 327.8 | 473.8 |
| Subtotal: | 2,157.2 | 1,246.2 | 8,351 | 150 | 476.0 | 9,553,680 | 196.0 | 13.5 | 45.9 | 142.9 | 7,424,045 | 2,157.2 | --- |

⁽¹⁾ Anticipated number of "Keys" represents hotel and resort uses. This includes 2.5 acres within DU 3/4.

⁽²⁾ Non-residential wastewater flows are calculated based on actual land use where detailed information is known and estimated square feet on the remainder.

⁽³⁾ The unit daily wastewater flow is calculated by taking the average day wastewater flow divided by the development unit flow area. The result is a unit daily wastewater flow in gallons per day per acre.

Abbreviations:
AC = Acres
GPD = Gallons Per Day
GPD/AC = Gallons Per Day Per Acre

TABLE 3

DU 3/4 Modeled Land Use

WOOD/PATEL

TABLE 3 - DU 3/4 MODELED LAND USE

Project: DU 3/4 at Eastmark
Location: Mesa, Arizona

Proj. Number: 113697.09
Proj. Engineer: Dan Matthews, P.E.

PRELIMINARY LAND USE AND DWELLING UNIT BREAKDOWN

| Parcel | No. of DUs | Residential Acres | Density (DU/Acre) | Non-Residential Acres | Land Use | Floor Area (SQ. FT.) | Population Density | Total Population | Wastewater Design Flows (Per Capita) | Avg Day Flow (GPD) | Total Avg Day Flow (GPD) |
|---------------------------|------------|-------------------|-------------------|-----------------------|---------------|----------------------|----------------------------------|------------------|--------------------------------------|--------------------|--------------------------|
| 3/4-1 | -- | -- | -- | 10.0 | Middle School | 87,120 | 100 Students and Staff / Acre | 1,000 | 40 GPD / Person | 40,000 | 40,000 |
| 3/4-2 | 460 | 23.0 | 20.0 | -- | HDR-2 | -- | 1.7 Persons / DU | 782 | 80 GPD / Person | 62,560 | 62,560 |
| Warner Road Totals | 460 | 23.0 | | 10.0 | | | | 1,782 | | 102,560 | 102,560 |

RAY ROAD SEWER

| | | | | | | | | | | | |
|------------------------|-------------|--------------|------|--------------|----------------------------------|----------------------|--|---------------|------------------------------------|------------------|------------------|
| 3/4-3 | -- | -- | -- | 58.9 | Park | -- | -- | -- | -- | -- | -- |
| 3/4-4 | -- | -- | -- | 5.0 | Elementary School | 43,560 | 200 Students and Staff / Acre | 1,000 | 40 GPD / Person | 40,000 | 40,000 |
| 3/4-5 | -- | -- | -- | 15.0 | Library | 50,000 | 0.4 Employees / 1,000 S.F. 2.0 Patrons / 1,000 S.F. | 20 | 54 GPD / Person 20 Person | 1,080 2,000 | 3,080 |
| 3/4-6 | -- | -- | -- | 16.0 | Aquatic Center | 50,000 | 200 Patrons and Staff / Acre | 3,200 | 10 GPD / Person | 32,000 | 32,000 |
| 3/4-7 | -- | -- | -- | 49.0 | University | -- | 4,780 Boarded Students | 4,780 | 80 GPD / Person | 382,400 | 382,400 |
| 3/4-8 | 640 | 32.0 | 20.0 | -- | HDR-2 | -- | 1.7 Persons / DU | 1,088 | 80 GPD / Person | 87,040 | 87,040 |
| 3/4-9 | -- | -- | -- | 112.0 | University | -- | 7,970 Boarded Students Commuter | 7,970 | 80 GPD / Person | 637,600 | 835,600 |
| 3/4-10 | 3,459 | 173.0 | 20.0 | -- | HDR-2 | -- | 1.7 Persons / DU | 5,880 | 80 GPD / Person | 470,400 | 470,400 |
| 3/4-11 | -- | -- | -- | 29.5 | Office | 1,124,000 | 5.0 Employees / 1,000 S.F. | 5,620 | 54 GPD / Person | 303,480 | 303,480 |
| 3/4-12 | -- | -- | -- | 12.5 | Office | 478,000 | 5.0 Employees / 1,000 S.F. | 2,380 | 54 GPD / Person | 128,520 | 128,520 |
| 3/4-13 | -- | -- | -- | 45.0 | Commercial / Retail / Restaurant | 278,000 | 2.5 Employees and Patrons / 1,000 S.F. | 685 | 54 GPD / Person | 37,530 | 205,530 |
| Other | -- | -- | -- | -- | Office | 525,000 | 5.0 Employees / 1,000 S.F. | 2,625 | 54 GPD / Person | 141,750 | 205,530 |
| Other | -- | -- | -- | -- | Theater | 12 Screens 50,000 | 250 Seats / Screen | 3,000 | 5.0 GPD / Seat | 15,000 | 15,000 |
| Other | -- | -- | -- | -- | Hotel | 45,000 | 150 Rooms | -- | 75 GPD / Room | 11,250 | -- |
| Ray Road Totals | 4099 | 205.0 | | 27.4 | Road ROW | -- | | 43,308 | | 2,488,050 | 2,488,050 |
| DU 3/4 Totals | 4599 | 228.0 | | 380.3 | | | | 45,090 | | 2,590,610 | 2,590,610 |

TABLE 4

DU 3/4 Wastewater Model

Project: Eastmark
 Location: Mesa, Arizona
 References: City of Mesa 2012 Engineering and Design Standards
 Arizona Administrative Code, Title 18, Chapter 9

Proj. Number: 144173
 Proj. Engineer: Dan Matthews, P.E.

| FROM NODE | TO NODE | SEWER AREA(S) SERVED | AREA SERVED (ACRES) | UNIT FLOW (GPD/AC) | PARCEL ADF (GPD) | SEWER NODE ADF (GPD) | TOTAL ADF (GPD) | PEAKING FACTOR | PEAK WET WEATHER FLOW (GPD) |
|--|---------|----------------------|---------------------|--------------------|------------------|----------------------|------------------|----------------|-----------------------------|
| Elliot Road Onsite Wastewater Flows | | | | | | | | | |
| E3 | E2 | DU-6C | 129.7 | 11,485.0 | 1,489,541 | 1,489,541 | 1,489,541 | 2.5 | 3,723,853 |
| E2 | E1 | DU-6A | 89.1 | 10,350.0 | 923,040 | 1,867,811 | 3,157,352 | 2.5 | 7,893,380 |
| | | DU-6B | 53.7 | 13,899.0 | 744,771 | | | | |
| E5 | E4 | DU-5E | 82.0 | 9,756.0 | 800,000 | 800,000 | 800,000 | 3.0 | 2,400,000 |
| Total to Elliot Road Outfall | | | 364.5 | | 3,957,352 | 3,957,352 | 3,957,352 | | 10,293,380 |

| Warner Road Onsite Wastewater Flows | | | | | | | | | |
|--|-------------------|-------|-------------|---------|----------------|----------------|----------------|-----|----------------|
| W7 | W6 | 3/4-1 | 10.0 | 4,000.0 | 40,000 | 40,000 | 40,000 | 3.0 | 120,000 |
| W6 | W1 | 3/4-2 | 23.0 | 2,720.0 | 62,560 | 62,560 | 102,560 | 3.0 | 307,680 |
| W1 | WARNER ROAD SEWER | - | - | - | - | - | 102,560 | 3.0 | 307,680 |
| Total to Warner | | | 33.0 | | 102,560 | 102,560 | 102,560 | | 307,680 |

| | | | | | | | | | |
|------------------------|--|--|-------------|--|----------------|----------------|----------------|--|----------------|
| Total to Warner | | | 33.0 | | 102,560 | 102,560 | 102,560 | | 307,680 |
|------------------------|--|--|-------------|--|----------------|----------------|----------------|--|----------------|

| Ray Road Onsite And Offsite Upstream Wastewater Flows | | | | | | | | | |
|--|-----|-----------------------------|-------|----------|-----------|-----------|-----------|-----|-----------|
| R4 | R3 | (1/3) 3/4-11 | 9.8 | 10,322.4 | 101,160 | 101,160 | 101,160 | 3.0 | 303,480 |
| R6 | R5 | 3/4-3 | 58.9 | - | - | 43,080 | 43,080 | 3.0 | 129,240 |
| | | 3/4-4 | 5.0 | 8,000.0 | 40,000 | | | | |
| | | 3/4-5 | 15.0 | 205.3 | 3,080 | | | | |
| R5 | R3 | 3/4-6 ⁽¹⁾ | 18.0 | 2,000.0 | 32,000 | 414,400 | 457,480 | 3.0 | 1,372,440 |
| | | 3/4-7 | 49.0 | 7,804.1 | 382,400 | | | | |
| R3 | R2 | (2/3) 3/4-11 ⁽¹⁾ | 19.7 | 10,270.1 | 202,320 | 330,840 | 869,460 | 3.0 | 2,688,440 |
| | | 3/4-12 | 12.5 | 10,281.6 | 128,520 | | | | |
| R9 | R8 | 3/4-8 | 32.0 | 2,720.0 | 87,040 | 87,040 | 87,040 | 3.0 | 261,120 |
| R8 | R7 | (1/2) 3/4-9 | 56.0 | 7,460.7 | 417,800 | 653,000 | 740,040 | 3.0 | 2,220,120 |
| | | (1/2) 3/4-10 | 86.5 | 2,719.1 | 235,200 | | | | |
| R7 | R2 | (1/2) 3/4-9 | 56.0 | 7,460.7 | 417,800 | 417,800 | 1,167,840 | 2.5 | 2,894,600 |
| R2 | R1 | (2/3) 3/4-13 ⁽¹⁾ | 30.0 | 4,587.3 | 137,020 | 137,020 | 2,184,340 | 2.5 | 5,910,850 |
| R24 | R22 | 7-8 | 23.5 | 1,307.2 | 30,720 | 56,235 | 56,235 | 3.0 | 168,705 |
| | | 7-9 | 23.1 | 841.6 | 19,440 | | | | |
| | | 7-10 | 7.5 | 810.0 | 6,075 | | | | |
| R23 | R22 | 7-6 | 18.5 | 493.0 | 9,120 | 90,480 | 90,480 | 3.0 | 271,440 |
| | | 7-7 | 25.8 | 877.6 | 23,520 | | | | |
| | | 7-11 | 24.4 | 1,416.4 | 34,560 | | | | |
| | | 7-12 | 23.0 | 1,012.2 | 23,280 | | | | |
| R22 | R21 | - | - | - | - | - | 146,715 | 3.0 | 440,145 |
| R21 | R20 | 7-13 | 19.2 | 975.0 | 18,720 | 85,420 | 232,135 | 3.0 | 696,405 |
| | | 7-14 | 17.3 | 735.3 | 12,720 | | | | |
| | | 7-15 | 18.4 | 756.5 | 13,920 | | | | |
| | | 7-23 | 20.0 | 1,760.0 | 35,200 | | | | |
| | | 7-24 | 6.0 | 810.0 | 4,860 | | | | |
| R20 | R19 | 7-16 | 26.4 | 963.6 | 25,440 | 66,984 | 299,119 | 3.0 | 897,357 |
| | | 7-17 | 20.1 | 1,260.9 | 25,344 | | | | |
| | | 7-22 | 20.0 | 810.0 | 16,200 | | | | |
| | | 7-27 | 29.3 | - | - | | | | |
| | | 7-18 | 29.1 | 701.0 | 20,400 | | | | |
| R19 | R16 | 7-19 | 23.8 | 1,038.7 | 24,720 | 93,336 | 392,455 | 3.0 | 1,177,365 |
| | | 7-20 | 19.9 | 964.8 | 19,200 | | | | |
| | | 7-21 | 19.0 | 1,061.1 | 20,160 | | | | |
| | | 7-25 | 2.5 | 810.0 | 2,025 | | | | |
| | | 7-26 | 5.5 | 1,242.0 | 6,831 | | | | |
| | | OFFUPSTREAM ⁽²⁾ | 1,473 | 707.2 | 1,041,710 | | | | |
| R18 | R17 | 7-1 | 15.9 | 1,352.5 | 21,504 | 1,096,214 | 1,096,214 | 2.5 | 2,748,035 |
| | | 7-4 | 32.3 | 624.1 | 20,160 | | | | |
| | | 7-5 | 25.1 | 631.1 | 15,840 | | | | |
| R17 | R16 | 7-2 | 19.3 | 982.4 | 18,960 | 45,360 | 1,144,574 | 2.5 | 2,861,435 |
| | | 7-3 | 30.7 | 859.9 | 26,400 | | | | |
| R16 | R15 | - | - | - | - | - | 1,537,029 | 2.5 | 3,842,573 |
| R15 | R14 | (1/2) 3/4-10 | 86.5 | 2,719.1 | 235,200 | 235,200 | 1,772,229 | 2.5 | 4,430,573 |
| R40 | R39 | SB105 | 99.1 | 840.4 | 83,280 | 83,280 | 83,280 | 3.0 | 249,840 |
| R39 | R38 | 9-6 | 22.4 | 642.9 | 14,400 | 14,400 | 97,680 | 3.0 | 293,040 |
| R38 | R34 | 9-2 | 31.8 | 498.1 | 15,840 | 25,984 | 123,564 | 3.0 | 370,692 |
| | | 9-3 | 12.4 | 810.0 | 10,044 | | | | |
| R36 | R35 | 9-7 | 60.7 | 595.7 | 36,160 | 48,900 | 48,800 | 3.0 | 145,400 |
| | | 18% of 9-5 | 7.2 | 577.8 | 4,160 | | | | |
| | | 33% of 9-4 | 18.3 | 520.2 | 8,480 | | | | |
| R37 | R35 | 82% of 9-5 | 32.6 | 584.0 | 19,040 | 36,000 | 36,000 | 3.0 | 108,000 |
| | | 67% of 9-4 | 33.1 | 512.4 | 16,960 | | | | |
| R35 | R34 | - | - | - | - | - | 84,800 | 3.0 | 254,400 |
| R34 | R33 | - | - | - | - | - | 208,364 | 3.0 | 625,092 |
| R33 | R27 | 18% of 9-1 | 9.7 | 560.8 | 5,440 | 5,440 | 213,804 | 3.0 | 641,412 |

Project: Eastmark
 Location: Mesa, Arizona
 References: City of Mesa 2012 Engineering and Design Standards
 Arizona Administrative Code, Title 18, Chapter 9

Proj. Number: 144173
 Proj. Engineer: Dan Matthews, P.E.

| FROM NODE | TO NODE | SEWER AREA(S) SERVED | AREA SERVED (ACRES) | UNIT FLOW (GPD/AC) | PARCEL ADF (GPD) | SEWER NODE ADF (GPD) | TOTAL ADF (GPD) | PEAKING FACTOR | PEAK WET WEATHER FLOW (GPD) |
|-----------|----------------|----------------------|---------------------|--------------------|------------------|----------------------|-----------------|----------------|-----------------------------|
| R32 | R30 | 8-6 | 23.8 | 925.4 | 21,840 | 58,320 | 58,320 | 3.0 | 174,960 |
| | | 8-7 | 28.2 | 829.8 | 17,780 | | | | |
| | | 42% of 8-3 | 10.4 | 823.1 | 6,490 | | | | |
| | | 8-8 | 6.8 | 0.0 | -- | | | | |
| | | 67% of 8-4 | 14.0 | 480.0 | 6,720 | | | | |
| R31 | R30 | 26% of 8-2 | 7.8 | 707.7 | 5,520 | 38,400 | 38,400 | 3.0 | 115,200 |
| | | 58% of 8-3 | 14.3 | 621.0 | 8,880 | | | | |
| | | 56% of 8-2 | 16.6 | 700.0 | 11,790 | | | | |
| R30 | R28 | 8-1 | 22.9 | 775.5 | 17,790 | -- | 96,720 | 3.0 | 290,160 |
| R29 | R28 | 8-9 | 21.7 | 707.8 | 15,380 | 31,680 | 31,680 | 3.0 | 95,040 |
| | | 8-8 | 20.0 | 468.0 | 9,360 | | | | |
| | | 33% of 8-4 | 6.9 | 487.0 | 3,360 | | | | |
| | | 18% of 8-2 | 5.4 | 668.7 | 3,600 | | | | |
| R28 | R27 | -- | -- | 0.0 | -- | -- | 128,400 | 3.0 | 385,200 |
| R27 | R26 | 42% of 9-1 | 22.7 | 556.8 | 12,640 | 12,640 | 354,844 | 3.0 | 1,064,532 |
| R26 | R25 | 40% of 9-1 | 21.6 | 563.0 | 12,160 | 12,160 | 367,004 | 3.0 | 1,101,012 |
| R25 | R14 | -- | -- | -- | -- | -- | 367,004 | 3.0 | 1,101,012 |
| R42 | R41 | 3S-2 | 31.4 | 909.6 | 28,560 | 63,040 | 63,040 | 3.0 | 189,120 |
| | | 3S-3 | 30.0 | 1,149.3 | 34,480 | | | | |
| R41 | R14 | 3S-1 | 30.9 | 1,100.3 | 34,000 | 34,000 | 97,040 | 3.0 | 291,120 |
| R14 | R13 | -- | -- | -- | -- | -- | 2,236,273 | 2.5 | 5,580,683 |
| R13 | R1 | (1/3) 3/4-13 | 15.0 | 4,687.3 | 86,510 | 1,033,676 | 3,269,949 | 2.5 | 8,174,873 |
| | | LDR3-1 | 380 | 720.0 | 273,600 | | | | |
| | | GI-1 | 40 | 810.0 | 32,400 | | | | |
| | | LI-1 | 318 | 378.0 | 120,204 | | | | |
| | | MUE-1 | 112 | 810.0 | 90,720 | | | | |
| | | MUE-2 | 7 | 810.0 | 5,670 | | | | |
| | | MDR3-1 | 231 | 1,280.0 | 295,680 | | | | |
| | | MUR1-1 | 62 | 2,040.0 | 126,480 | | | | |
| CC-1 | 27 | 758.0 | 20,412 | | | | | | |
| R1 | RAY ROAD SEWER | (1) | -- | -- | -- | -- | 5,454,289 | 2.5 | 13,635,723 |

| | | | | | |
|---|--------------|------------------|------------------|------------------|-------------------|
| Total Onsite Flow to Elliot Road Outfall west of DU 5E | 364.5 | 3,957,352 | 3,957,352 | 3,957,352 | 10,293,380 |
|---|--------------|------------------|------------------|------------------|-------------------|

| | | | | | |
|---|-------------|----------------|----------------|----------------|----------------|
| Total Onsite Flow to Warner Road Outfall at Ellsworth Road | 33.0 | 102,560 | 102,560 | 102,560 | 307,680 |
|---|-------------|----------------|----------------|----------------|----------------|

| | | | | | |
|--|---------------|------------------|------------------|------------------|----------------------|
| Total Onsite Flow to Ray Road Outfall at Ellsworth Road | 1769.7 | 3,364,133 | 3,364,133 | 3,384,133 | (1) 8,410,333 |
|--|---------------|------------------|------------------|------------------|----------------------|

| | | | | | |
|---|---------------|------------------|------------------|------------------|-------------------|
| Total Onsite Flow, Elliot + Warner + Ray Basins: | 2157.2 | 7,424,045 | 7,424,045 | 7,424,045 | 19,011,393 |
|---|---------------|------------------|------------------|------------------|-------------------|

| | | | | | |
|--|---------------|------------------|------------------|------------------|-----------------------|
| Total to Ray Road Outfall at Ellsworth Road | 4405.2 | 5,454,289 | 5,464,289 | 5,454,289 | (1) 13,635,723 |
|--|---------------|------------------|------------------|------------------|-----------------------|

(1) Peak Wet Weather Wastewater Flow for the proposed sewer area (3/4-6) aquatic center equals the average day flow of 32,000 GPD times a peaking factor of 3. Additionally, during the draining of the pool facility, an additional capacity of 450,000 gallons over 8 hours is required by the City of Mesa Parks and Recreation. Draining the pool facility is considered a rare occurrence, but for calculations during the draining of the pool facility see Notes 3, 4, and 5 on Table 5.

(2) Offsite wastewater flow within the Signal Butte Road sewer line includes flow from the Mountain Horizons and Nova Vista developments (Avg Day = 1,040,576 gpd) per the Master Wastewater Report for Ray Road Sewer Between Ellsworth and Mountain Roads, by CMX, 11/18/2005, and the City of Mesa Signal Butte/Ellot Water Campus (Avg Day = 1,134 gpd)

TABLE 5

DU 3/4 Calculated Pipe Capacities

Project: Eastmark
 Location: Mesa, Arizona
 References: ADEQ Bulletin No. 11
 City of Mesa 2012 Engineering and Design Standards

CIVIL ENGINEERS * HYDROLOGISTS * LAND SURVEYORS * CONSTRUCTION MANAGERS
 Proj. Number: 144173
 Proj. Engineer: Dan Matthews, P.E.

| FROM NODE | TO NODE | NOTES | PIPE DIA. (INCHES) | MODELED PIPE SLOPE (FT / FT) | PIPE CAPACITY (GPD) | | PEAK FLOW RESULTS | | | | | |
|-------------------------------------|---------|--------------|--------------------|------------------------------|---------------------|-------|-----------------------------|-----------------------------|-------------------|---------------------------------|--------------------------------------|-----------------------------------|
| | | | | | GPD | GPM | PEAK WET WEATHER FLOW (GPD) | PEAK WET WEATHER FLOW (GPM) | d/D (WET WEATHER) | FLOW VELOCITY (FT/S) AT d/D=2/3 | SURPLUS CAPACITY (WET WEATHER) (GPD) | PERCENT OF CAPACITY (WET WEATHER) |
| | | | | | | | | | | | | |
| Elliot Road Basin Pipe Sizes | | | | | | | | | | | | |
| E3 | E2 | Proposed | 24 | 0.0010 | 4,699,751 | 3,243 | 3,723,853 | 2,566 | 0.67 | 2.5 | 945,898 | 79.7% |
| E2 | E1 | (1) Existing | 30 | 0.0010 | 8,248,208 | 5,728 | 7,833,360 | 5,462 | 0.77 | 2.9 | 354,826 | 95.7% |
| E5 | E4 | Proposed | 21 | 0.0020 | 4,653,391 | 3,238 | 2,400,000 | 1,667 | 0.51 | 3.3 | 2,263,391 | 51.5% |
| Warner Road Basin Pipe Sizes | | | | | | | | | | | | |
| W7 | W6 | Proposed | 21 | 0.0025 | 5,129,730 | 3,562 | 120,000 | 83 | 0.10 | 3.7 | 5,009,730 | 2.3% |
| W8 | W1 | Proposed | 21 | 0.0025 | 5,129,730 | 3,562 | 307,680 | 214 | 0.17 | 3.7 | 4,822,050 | 6.0% |
| Ray Road Basin Pipe Sizes | | | | | | | | | | | | |
| R4 | R3 | (2) Proposed | 12 | 0.0025 | 1,167,463 | 811 | 303,480 | 211 | 0.35 | 2.5 | 863,983 | 26.0% |
| R6 | R5 | Proposed | 8 | 0.0048 | 541,466 | 376 | 129,240 | 90 | 0.33 | 2.7 | 412,226 | 23.9% |
| R5 | R3 | (3) Proposed | 15 | 0.0044 | 2,775,761 | 1,928 | 1,372,440 | 953 | 0.49 | 3.9 | 1,403,321 | 49.4% |
| R3 | R2 | (4) Proposed | 21 | 0.0020 | 4,653,391 | 3,238 | 2,668,440 | 1,353 | 0.54 | 3.3 | 1,994,951 | 57.2% |
| R9 | R8 | Proposed | 12 | 0.0030 | 1,298,882 | 881 | 261,120 | 181 | 0.30 | 2.6 | 1,007,862 | 20.6% |
| R8 | R7 | Proposed | 18 | 0.0030 | 3,768,802 | 2,817 | 2,220,120 | 1,542 | 0.55 | 3.7 | 1,548,682 | 55.9% |
| R7 | R2 | Proposed | 18 | 0.0040 | 4,338,633 | 3,014 | 2,894,800 | 2,010 | 0.59 | 4.2 | 1,445,233 | 66.7% |
| R2 | R1 | (5) Proposed | 27 | 0.0021 | 9,250,737 | 6,424 | 5,910,850 | 4,105 | 0.58 | 4.0 | 3,339,887 | 53.9% |
| R24 | R22 | Existing | 12 | 0.0045 | 1,522,778 | 1,057 | 168,705 | 117 | 0.22 | 3.3 | 1,354,073 | 11.1% |
| R23 | R22 | Existing | 8 | 0.0050 | 564,029 | 392 | 271,440 | 189 | 0.48 | 2.8 | 282,589 | 48.1% |
| R22 | R21 | Existing | 12 | 0.0045 | 1,522,778 | 1,057 | 440,145 | 306 | 0.37 | 3.3 | 1,082,633 | 28.9% |
| R21 | R20 | Existing | 15 | 0.0020 | 1,903,379 | 1,322 | 696,405 | 484 | 0.42 | 2.7 | 1,206,974 | 36.6% |
| R20 | R19 | Existing | 15 | 0.0020 | 1,903,379 | 1,322 | 897,357 | 623 | 0.48 | 2.7 | 1,006,022 | 47.1% |
| R19 | R16 | Existing | 15 | 0.0020 | 1,903,379 | 1,322 | 1,177,265 | 818 | 0.57 | 2.7 | 726,014 | 61.9% |
| R18 | R17 | Existing | 18 | 0.0064 | 5,481,895 | 3,807 | 2,748,035 | 1,908 | 0.50 | 5.3 | 2,733,860 | 50.1% |
| R17 | R16 | Existing | 18 | 0.0070 | 5,710,307 | 3,965 | 2,861,435 | 1,987 | 0.50 | 5.5 | 2,848,872 | 50.1% |
| R16 | R15 | Existing | 21 | 0.0034 | 6,062,406 | 4,210 | 3,842,573 | 2,568 | 0.58 | 4.3 | 2,219,833 | 63.4% |
| R15 | R14 | Existing | 21 | 0.0030 | 5,596,069 | 3,886 | 4,430,573 | 3,077 | 0.67 | 4.0 | 1,165,496 | 79.2% |
| R40 | R39 | Proposed | 10 | 0.0027 | 740,224 | 514 | 249,840 | 174 | 0.40 | 2.3 | 490,384 | 33.8% |
| R39 | R38 | Proposed | 10 | 0.0027 | 740,224 | 514 | 293,040 | 204 | 0.43 | 2.3 | 447,184 | 39.6% |
| R38 | R34 | Proposed | 12 | 0.0019 | 1,015,186 | 705 | 370,692 | 257 | 0.42 | 2.2 | 644,494 | 35.5% |
| R36 | R35 | Proposed | 8 | 0.0033 | 451,224 | 313 | 146,400 | 102 | 0.39 | 2.2 | 304,824 | 37.4% |
| R37 | R35 | Proposed | 8 | 0.0033 | 451,224 | 313 | 108,000 | 75 | 0.34 | 2.2 | 343,224 | 23.9% |
| R35 | R34 | Proposed | 10 | 0.0025 | 704,975 | 490 | 254,400 | 177 | 0.42 | 2.2 | 450,575 | 35.1% |
| R34 | R33 | Proposed | 15 | 0.0014 | 1,586,149 | 1,101 | 625,092 | 434 | 0.43 | 2.2 | 961,057 | 39.4% |
| R33 | R27 | Proposed | 15 | 0.0014 | 1,586,149 | 1,101 | 641,412 | 445 | 0.44 | 2.2 | 944,737 | 40.4% |
| R32 | R30 | Proposed | 8 | 0.0038 | 473,785 | 329 | 174,860 | 122 | 0.43 | 2.3 | 298,925 | 36.9% |
| R31 | R30 | Proposed | 8 | 0.0096 | 767,060 | 533 | 115,200 | 80 | 0.27 | 3.8 | 651,860 | 15.0% |
| R30 | R23 | Proposed | 8 | 0.0127 | 879,896 | 611 | 280,160 | 202 | 0.40 | 4.3 | 599,736 | 33.0% |
| R29 | R28 | Proposed | 8 | 0.0038 | 473,785 | 329 | 95,040 | 65 | 0.31 | 2.3 | 378,745 | 20.1% |
| R28 | R27 | Proposed | 8 | 0.0040 | 496,346 | 345 | 385,200 | 268 | 0.67 | 2.4 | 111,146 | 77.6% |
| R27 | R26 | Proposed | 15 | 0.0014 | 1,586,149 | 1,101 | 1,064,532 | 739 | 0.60 | 2.2 | 521,617 | 67.1% |
| R26 | R25 | Proposed | 18 | 0.0011 | 2,284,123 | 1,586 | 1,101,012 | 785 | 0.48 | 2.2 | 1,183,111 | 48.2% |
| R25 | R14 | Proposed | 18 | 0.0011 | 2,284,123 | 1,586 | 1,101,012 | 755 | 0.48 | 2.2 | 1,183,111 | 48.2% |
| R42 | R41 | Proposed | 8 | 0.0040 | 496,346 | 345 | 189,120 | 131 | 0.43 | 2.4 | 307,226 | 38.1% |
| R41 | R14 | Proposed | 8 | 0.0050 | 564,029 | 392 | 291,120 | 202 | 0.51 | 2.6 | 272,909 | 51.6% |
| R14 | R13 | Existing | 21 | 0.0061 | 6,083,211 | 5,813 | 5,590,663 | 3,982 | 0.61 | 5.8 | 2,492,528 | 69.2% |
| R13 | R1 | Existing | 24 | 0.0075 | 12,791,055 | 8,863 | 8,174,873 | 5,577 | 0.58 | 7.0 | 4,616,183 | 63.9% |

NOTES:

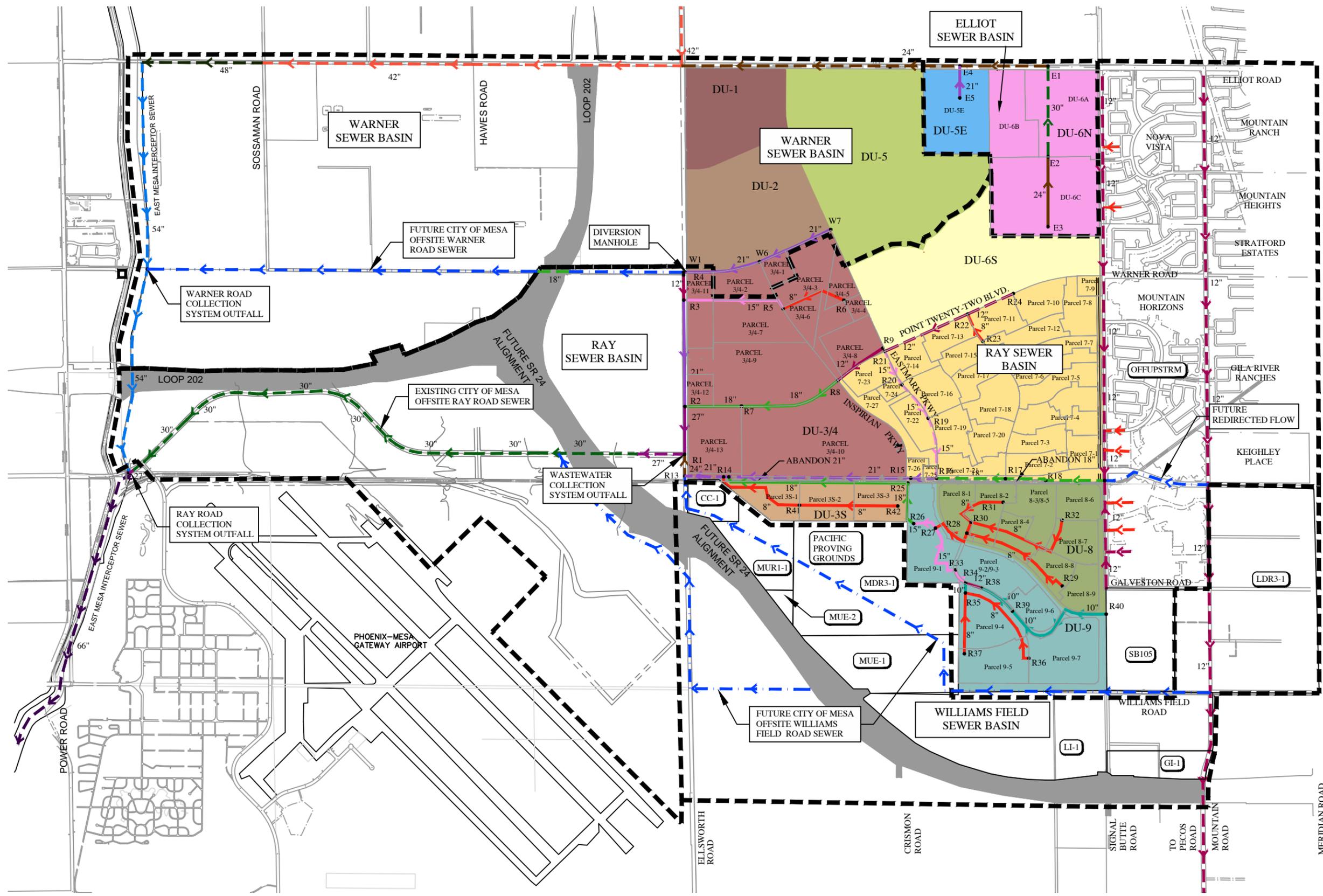
- (1) Pipe segment E2 to E1 is existing and was sized by First Solar's Engineer.
- (2) This pipe segment has been upsized for flexibility due to unknown phasing of offsite development planned to contribute flows to the Ray Road Sewer. The pipe size represents a scenario assuming no offsite development has occurred prior to the construction of the Warner Road Sewer allowing for higher onsite contribution in the initial condition.
- (3) Peak Wet Weather Wastewater Flow for the proposed sewer area (3/4-6) aquatic center equals the average day flow of 32,000 gpd times a peaking factor of 3. However, during the draining of the pool facility, an additional capacity of 450,000 gallons over 8 hours is required by the City of Mesa Parks and Recreation. Therefore, all sewer lines downstream of node R5 have an additional 937.5 GPM (450,000 gallons/8 hours/ 60 minutes per hour) during the time the pool facility is drained. This additional flow increases the peak wet weather flow to 1,691 GPM for the pipe segment R5 to R3. The pipe has a maximum capacity of 2,068 GPM; thus, the pipe will be flowing at 92% full. Additionally, d/D = 0.80 during the draining of the pool.
- (4) The additional flow of 937.5 GPM during the draining of the pool facility increases the peak wet weather flow to 2,791 GPM for the pipe segment R3 to R2. The pipe has a maximum capacity of 3,421 GPM; thus, the pipe will be flowing at 82% full. Additionally, d/D = 0.73 during the draining of the pool.
- (5) The additional flow of 937.5 GPM during the draining of the pool facility increases the peak wet weather flow to 5,043 GPM for the pipe segment R2 to R1. The pipe has a maximum capacity of 6,851 GPM; thus, the pipe will be flowing at 74% full. Additionally, d/D = 0.67 during the draining of the pool.

PLATE 1

Vicinity Map

PLATE 2

DU 3/4 Master Sewer Exhibit



LEGEND

| EXISTING SEWER | | PLANNED SEWER | |
|----------------|--|---------------|--|
| 8" | | 8" | |
| 10" | | 10" | |
| 12" | | 12" | |
| 15" | | 15" | |
| 18" | | 18" | |
| 21" | | 21" | |
| 24" | | 24" | |
| 27" | | 27" | |
| 30" | | 30" | |
| 36" | | 36" | |
| 42" | | 42" | |
| 48" | | 48" | |
| 54" | | 54" | |
| 66" | | 66" | |

ON-SITE DEVELOPMENT UNITS

| | | | |
|--------|--|-------|--|
| DU 1 | | DU 6N | |
| DU 2 | | DU 6S | |
| DU 3S | | DU 7 | |
| DU 3/4 | | DU 8 | |
| DU 5 | | DU 9 | |
| DU 5E | | | |

OFF-SITE LAND USE DESIGNATIONS*

- SEWER BASIN BOUNDARIES:
- ONSITE SEWER SUB-BASIN BOUNDARIES:
- ONSITE SEWER SUB-BASIN LABELS: DU-1A
- OFFSITE CONTRIBUTING SEWER BASIN:
- OFFSITE SEWER SUB-BASIN BOUNDARIES:
- * OFF-SITE LAND USE DESIGNATIONS ARE PER THE 2004 COM WWMP
- OTHER:
 - FUTURE SEWER BY OTHERS:
 - EXISTING SEWER LIFT STATION:

Scale: 2500 0 1250 2500
Horz. 1 in. = 2500 ft.

PLATE 2 - DU 3/4 MASTER SEWER EXHIBIT
EASTMARK
MESA, ARIZONA

PRELIMINARY
NOT FOR CONSTRUCTION
OR RECORDING

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