Revision and Update History

- *October 2011:* Original Report
- *March 2012:* This report was updated to reflect the high end densities of the proposed land uses within the Community Development Plan
- *August 2014:* This report was updated to remove Offsite Area #5 from the sewer system, as this area is now being served by the Ray Road sewer line.

Table of Contents

Exhibits

1.0 Introduction

The Pacific Proving Grounds North (PPGN) is generally located east of Ellsworth Road, north of the future State Route 24 (previously referred to as SR 802), south of the Ray Road alignment, and west of Signal Butte Road (See Exhibit 1: Vicinity Map). An updated ALTA Survey was prepared by Rosendahl Millet & Associates dated January 17, 2011 (Exhibit 2). The ALTA survey shows two separate parcels described as Area 1 with an area of 456.6 acres and Area 2 with an area of 105.7 acres. The scope of this report will deal with the development of a portion of Area 1 only and will be called the PPGN site throughout the balance of this report. The entitlements for Area 2 will be accomplished under a separate submittal in the future.

The PPGN site is located in portions of Sections 26, 27, 34 and 35 in the Township 1 South, Range 7 East of the Gila & Salt River Base and Meridian in Maricopa County, Arizona.

The PPGN site is within the southern portion of the original General Motors Proving Grounds. The northern portion of the GM Proving Grounds is owned by DMB Associates, Inc. who refers to their project as Mesa Proving Grounds (now referred to as "Eastmark"). See Exhibit 3 for the latest DMB Mesa Proving Grounds Master Sewer Exhibit at Full Build Out. The Phoenix Mesa Gateway Airport is located on the west side of Ellsworth Road and this regional area of Mesa is known as the Mesa Gateway Area. A Strategic Development Plan for Mesa Gateway has been prepared by the City of Mesa and was adopted by Resolution No. 9425 on December 8, 2008.

Revised Report Summary

This report has been revised (August 2014) to reflect the modifications made to the Eastmark Master Sewer Report (Prepared by Wood Patel & Assoc, Inc., dated 1/15/2014). Offsite 5, known as SB105 and as shown in Exhibit 10, is now accommodated through the sewer main installed as part of the Eastmark DU 8&9 construction. As a result, Offsite 5 was removed from the sewer demand (Exhibit 8) and pipe capacity (Exhibit 9) calculations of this report. The following portions of this report have been updated:

- Section 5 Sewer System Design Criteria – the sentence discussing Offsite 5
- Exhibit 3 – Master Sewer Exhibit, Full Build Out Conditions of Mesa Proving Grounds (Revised 1/15/2014)
- Exhibit 8 – Sewer Demands – Average Day
- Exhibit 9 – Peak Daily Sewer Flows (Wet Weather) and Pipe Capacity Using Manning's Equation
- Exhibit 10 – Master Sewer Exhibit

2.0 Master Sewer Report Scope

The PPGN will be a Community Development Plan (CDP) and will consist of individual Development Units (DU). This Master Sewer Report will consider the design for the build out of the CDP. This Master Sewer Report is an overall view of both the PPGN and upstream properties, and is intended to size sewer lines accordingly. Each DU will be required to prepare its own Master Sewer Plan to address final densities and layouts specific to that particular Development Unit Plan (DUP).

This report does not address how the site will be phased as there are many factors that will shape the phasing and development of this area. In some cases, a phase of development may require extension of facilities outside or beyond that phase of construction. Phasing of sewer improvements will be addressed with each DUP and/or Preliminary Plat.

3.0 City of Mesa Sewer Master Plan

The PPGN falls within the Gateway Area Sewer Improvements Master Plan (GASIMP). The GASIMP dated January 2009 covers several sewer basins, including the Elliot Road, Warner Road, Ray Road, Williams Field Road, and Pecos Road Sewer Basins. The PPGN falls into the Williams Field Road Sewer Basin.

3.1 Current Williams Field Road Sewer Basin Plan

The current plan for the Williams Field Road Sewer Basin as described in the GASIMP is to extend a 21" sewer trunk line from the intersection of Ray Road and Ellsworth Road south to Williams Field Road where it would turn to the east and reduce to an 18" trunk line. Ultimately it would downsize to a 12" line and pick up outfall from properties as far east as Meridian Road. Flow collected in the Williams Field Road Sewer Basin would merge with the Ray Road Basin (at the intersection of Ray Road and Ellsworth Road) and be conveyed west along Ray Road to the East Mesa Interceptor that eventually discharges into the Greenfield Water Reclamation Plant. The Ray Road sewer line, and other downstream lines, have been sized considering the development of the Williams Field Road Sewer Basin.

Refer to Exhibit 5, City of Mesa Gateway Master Sewer Improvements for existing and proposed sewer lines regarding the following sewer line discussions in this report. All of the public sewer lines will be owned and maintained by the City after completion of construction.

The City has recently indicated that the Williams Field Road sewer cannot be routed as shown on the GASIMP. An Arizona Department of Transportation (ADOT) box culvert is being constructed at Ellsworth Road and Ray Road. Due to

the culvert's depth, the 21" Ellsworth line cannot be built to the South. The GASIMP will have to be revised to account for this feature.

3.2 Proposed Williams Field Road Sewer Basin Plan

It is proposed that the Williams Field Road Sewer Basin be modified to exclude all areas south or west of the proposed SR 24 Freeway. Therefore, it is proposed that the trunk line to service this modified basin be routed through the roadways proposed within PPGN. The proposed trunk line would then be routed in Williams Field Road east of Crismon Road. Final alignments for sewer lines will ultimately depend on both the final land plan, as well as the phasing of construction. The DUP for each unit will address any changes as proposed in this report.

The Current Williams Field Sewer basin was defined in the DMB Mesa Proving Grounds Master Sewer Report as shown in Exhibit 3. This basin has been highlighted and overlaid onto the GASIMP in Exhibit 6. This basin's area was slated to serve 1,935± acres. The 189± acres occupied by the proposed SR 24 right-of-way, the proposed internal parks, and the proposed internal street rights-of-way for the PPGN, was removed from the service acreage. Due to the realignment of the trunk line discussed above, and the alignment of SR 24 bisecting the original basin, the basin is redefined to serve an area of 1,330± acres as shown in Exhibit 7. The City of Mesa should evaluate the 416± acres that lie south or west of the proposed SR 24 Freeway to determine whether it can be added back into the Williams Field basin with sewer stubs beneath the SR 24 alignment or be reassigned to the Pecos Road Basin.

4.0 Existing Conditions

Sewer service for the PPGN property will be provided by the recently constructed Ray Road sewer (west of Ellsworth Road) per the GASIMP. Note that the GASIMP shows the Ray Road sewer as 'future', but it was constructed after the date of the report and exhibit.

The City of Mesa has a design project that is in the beginning stages of construction at the time of this report that will extend sewer south from the intersection of Ellsworth Road and Ray Road. This proposed sewer will run south in Ellsworth Road along the entire frontage of the project. The proposed line is a 21" with 21" stubs at the northern most and southern most ends of the PPGN frontage along Ellsworth Road. There is also a proposed manhole that is located approximately five feet north of the centerline of the main entry into PPGN.

Between Ellsworth Road and Signal Butte Road the Ray Road alignment has an existing 21" PVC sewer line that transitions to an 18" sewer line. This line connects into the now existing Ray Road sewer line. There is also several thousand feet of 12" sewer line extending north from Ray Road along Signal Butte Road.

Williams Field Road has no existing sewer.

Mountain Road has an existing 12" PVC sewer line located 19' east of the centerline. This sewer line could serve as a likely sewer outfall for the eastern portions of the Williams Field Road Basin if phasing requires. Further investigation and study is needed to confirm that adequate depth is available.

5.0 Sewer System Design Criteria

The calculations of sewer flows and pipe sizing in this report are based on system design criteria in the City of Mesa Engineering Design Standards dated 2009, as well as Title 18, Chapter 9 of the Arizona Administrative Code, and regionally accepted design standards.

Average daily sewer use was estimated as outlined in Section 411 of the City of Mesa Engineering Design Standards. Land uses were modeled based on the proposed PPGN land uses and the City of Mesa General Plan for areas outside of the PPGN project area.

Sewer design criteria for Modeled Land Use can be found in Exhibit 8. The total of calculated average day sewer flow is 1.07 million gallons per day (MGD).

A peaking factor was applied to the average daily sewer flows as outlined in Section 411 of the City of Mesa Engineering Design Standards. A peaking factor of 3.0 was applied to all flows less than 1.0 MGD and a peaking factor of 2.5 was applied to flows between 1.0 and 10.0 MGD. It is our understanding that this peaking factor accounts for peak usage and wet weather flows. The total calculated peak sewer flow at the point of discharge into the existing City of Mesa sewer facilities is 2.7 MGD.

6.0 Proposed Sewer System

The proposed sewer system has been preliminarily designed based on the most current master plan and the peak demands as described above. The PPGN build-out peak flows and pipe sizing calculations are found in Exhibit 9. The proposed sewer system has been designed to connect into a proposed manhole is being constructed with a current City of Mesa utility extension project.

The preliminary design shows that the main sewer trunk lines are 21", 18", 15", 12" and 10". Pipe size was determined by two thirds flow depth in the proposed pipes. The

alignment of these sewer trunk lines are shown on the Master Sewer Exhibit located in Exhibit 10. Minimum slopes of these trunk lines are as follows:

Proposed Minimum Sewer Slopes	
21" Trunk Lines	0.0012 ft/ft
18" Trunk Lines	0.0016 ft/ft
15" Trunk Lines	0.0028 ft/ft
12" Trunk Lines	0.0028 ft/ft
10" Trunk Lines	0.0042 ft/ft

These slopes are greater than the minimum required by ADEQ. The slope of the sewer lines is enhanced because of the natural ground slope. At the sewer connection at the intersection of Ray Road and Ellsworth Road, there is approximately 18' of cover over the existing stub. The trunk line terminates at the southwest corner of the area labeled "Offsite 8" with approximately 16' of cover. The natural ground in this area slopes to the southwest at approximately 0.60%. Considering these two factors, this preliminary design provides adequate sewer depth for the most upstream users in the Williams Field Road Sewer Basin.

Any phasing of development will require the construction of final pipe sizing as calculated in this report and each DU will conduct a Master Sewer Report for its internal flows and pipe sizing. The Williams Field Road sewer line will be sized for all upstream properties, burdening downstream properties with over-sized sewer lines until full build out. However, downstream properties may be eligible for pay backs as upstream users connect to this line.

7.0 Conclusion

This Master Sewer Report has analyzed the design for the build out of the CDP. Conceptual peak usage demands have been estimated and the sewer trunk lines have been sized based on these estimates. This report represents a change to the current City of Mesa Sewer Master Plan to account for the future SR 24 Freeway and the proposed PPGN site.

This report has addressed PPGN as a whole; however, each DU will be required to prepare its own Master Sewer Plan to address final densities and layouts specific to that particular Development Unit Plan (DUP).

This report does not address how the site will be phased as there are many factors that will shape the phasing and development of this area. In some cases, a phase of development may require extension of facilities outside or beyond that phase of construction. Phasing of sewer improvements will be addressed with each DUP.

Harvard Investments
Pacific Proving Grounds North Site

Master Sewer Report
for
Harvard Investments

City of Mesa, Arizona

Reviewed ENGR
11/17/14
Stephen Ganstrom

Registered Professional Engineer (Civil)
CERTIFICATE NO.
30014
KEVIN R.
MORGAN
DATE SIGNED
ARIZONA, U.S.A.
EXPIRES 03/31/2017

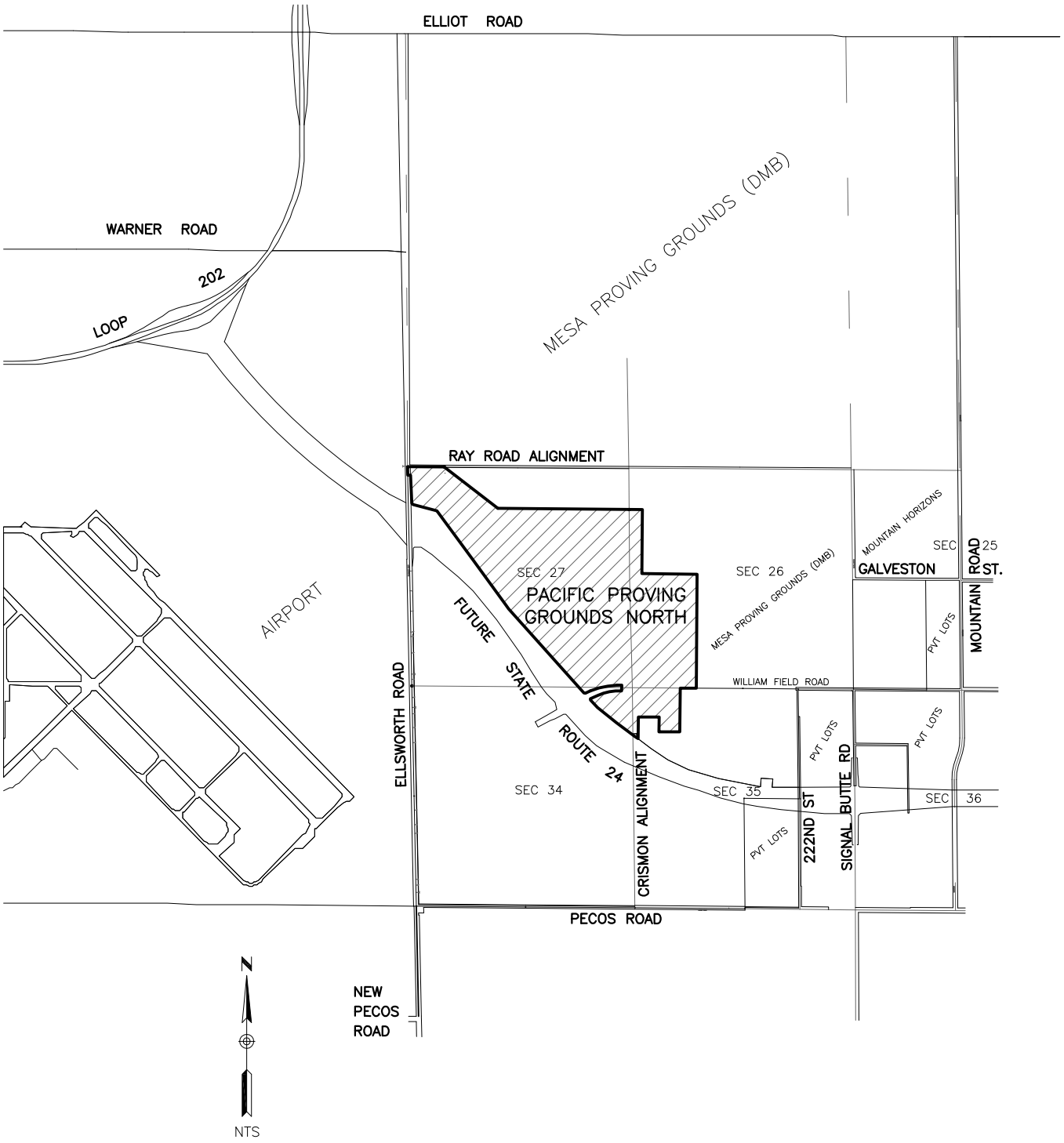
Project No. 11-007

Date: October, 2011
Revised: March, 2012
Revised: August 2014

2045 S. Vineyard Avenue, Suite 101
Mesa, AZ 85210
o: 480.503.2250
f: 480.503.2258

EXHIBIT I

VICINITY MAP



EXHBT

Project: **PACIFIC PROVING GROUNDS NORTH**
OWNERSHIP MAP
Mesa, Arizona

VICINITY MAP

eps group, Inc.
Engineers, Planners & Surveyors
2045 S. Vineyard, Ste. 101, Mesa, Arizona 85210
Phone (480) 503-2250 Fax (480) 503-2258

EXHIBIT 2

ALTA SURVEY

AN

ALTA/ACSM LAND TITLE SURVEY

FOR

A PORTION OF THE OLD GM PROVING GROUND

A PORTION OF
TOWNSHIP 1 SOUTH, RANGE 7 EAST
GILA & SALT RIVER BASE AND MERIDIAN
MARICOPA COUNTY, ARIZONA

LEGAL DESCRIPTION

AREA 1:

THOSE PORTIONS OF SECTIONS 26, 27 34 AND 35, TOWNSHIP 1 SOUTH , RANGE 7 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 27;

THENCE S89°38'15"E ALONG THE NORTH LINE OF SAID SECTION 27 BEING THE BASIS OF BEARINGS OF THIS DESCRIPTION, A DISTANCE OF 876.65 FEET, MEASURED PER THE RECORD;

THENCE S52°18'19"E, A DISTANCE OF 1624.90 FEET, MEASURED PER THE RECORD;

THENCE S89°29'10"E, A MEASURED DISTANCE OF 3149.43 FEET TO THE EAST LINE OF SAID SECTION 27, THE RECORD DISTANCE BEING 3148.67 FEET, WHICH POINT LIES S00°22'50"E, A MEASURED 991.93 FEET MEASURED FROM THE NORTHEAST CORNER THEREOF, THE RECORD DISTANCE BEING 992.09 FEET;

THENCE CONTINUING S89°29'10"E 315.76 FEET, MEASURED PER THE RECORD;

THENCE S00°23'52"W 1531.69 FEET, MEASURED PER THE RECORD;

THENCE S89°13'23"E 1323.72 FEET, MEASURED PER THE RECORD;

THENCE S00°28'40"W, A MEASURED DISTANCE OF 2731.36 FEET TO A POINT ON THE NORTH LINE OF SAID SECTION 35, THE RECORD DISTANCE BEING 2730.34 FEET;

THENCE N89°38'00"W 1384.87 FEET ALONG THE NORTH LINE OF SAID SECTION 35;

THENCE S00°23'52"W 1098.28 FEET TO A POINT ON THE PROPOSED NORTHERLY RIGHT-OF-WAY BOUNDARY OF STATE ROUTE 24;

THENCE N89°36'08"W 65.00 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE S00°23'52"W 75.40 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF-WAY LINE BOUNDARY;

THENCE N53°38'18"W 558.45 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N51°05'35"W 587.26 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N44°05'13"W 249.25 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N08°21'48"E 30.47 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N64°48'20"E 191.85 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF-WAY BOUNDARY TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A CENTRAL ANGLE OF 28°39'37", A RADIUS OF 1178.53 FEET, A CHORD BEARING OF S79°08'09"W AND A DISTANCE OF 583.40 FEET;

THENCE 589.52 FEET ALONG SAID CURVE AND SAID PROPOSED NORTHERLY RIGHT-OF-WAY BOUNDARY TO A POINT;

THENCE N00°34'55"E 138.76 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF-WAY BOUNDARY TO A POINT ON A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A CENTRAL ANGLE OF 19°47'46", A RADIUS OF 1861.15 FEET, A CHORD BEARING OF S81°09'36"W AND A DISTANCE OF 639.85 FEET;

THENCE 643.04 FEET ALONG SAID CURVE AND SAID PROPOSED NORTHERLY RIGHT-OF-WAY BOUNDARY TO A POINT;

THENCE S71°15'43"W 131.23 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE S63°49'31"W 125.36 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N80°12'45"W 39.15 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N41°45'20"W 2702.98 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N36°12'25"W 2915.15 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N75°45'39"W 593.43 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N39°09'11"W 40.14 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE N02°32'44"W 675.54 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF WAY BOUNDARY;

THENCE S88°53'39"W 67.73 FEET ALONG SAID PROPOSED NORTHERLY RIGHT-OF-WAY BOUNDARY TO A POINT ON THE WEST LINE OF SAID SECTION 27 ALSO BEING THE MONUMENT LINE OF ELLSWORTH ROAD AND THE WEST BOUNDARY OF THIS DESCRIPTION;

THENCE N01°06'21"W 205.80 FEET ALONG SAID WEST LINE AND SAID MONUMENT LINE TO THE NORTHWEST CORNER OF SAID SECTION 27 ALSO BEING THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 460.071 ACRES MORE OR LESS.

BEARINGS AND DISTANCES SHOWN ARE BASED UPON NAD 83, ARIZONA CENTRAL ZONE.

LEGAL DESCRIPTION

AREA 2:

THAT PORTION OF THE SOUTHWEST QUARTER OF SECTION 25, TOWNSHIP 1 SOUTH, RANGE 7 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID SECTION 25;

THENCE N00°24'52"W, A MEASURED DISTANCE OF 2624.75 FEET TO THE WEST QUARTER CORNER OF SAID SECTION 25, THE RECORD COURSE BEING N00°23'22"W, 2625.85 FEET;

THENCE S89°41'44"E, A MEASURED DISTANCE OF 1749.98 FEET TO THE NORTHEAST CORNER OF THE WEST TWO-THIRDS OF SAID SOUTHWEST QUARTER OF SECTION 25, THE RECORD COURSE BEING S89°39'45"E, 1749.34 FEET;

THENCE S00°32'46"E, A MEASURED DISTANCE OF 2628.34 FEET TO A POINT ON THE SOUTH BOUNDARY OF SAID SECTION 25, THE RECORD COURSE BEING S00°32'04"E, 2628.23 FEET;

THENCE N89°34'51"W ALONG THE SOUTH LINE OF SAID SECTION 25, A MEASURED DISTANCE OF 1756.07 FEET TO THE POINT OF BEGINNING, THE RECORD COURSE BEING N89°35'17"W, 1756.03 FEET.

SAID PARCEL CONTAINS 105.691 ACRES MORE OR LESS.

**NOTE: RECORD DISTACNES CALLED OUT IN LEGAL DESCRIPTION ARE THE RECORDED DISTANCES FROM "EXHIBIT A" IN THE TITLE REPORT. (FILE NO. 01694702)

SCHEDULE "B" EXCEPTIONS

ITEMS THAT APPLY TO CURRENT SURVEY
FROM LAWYERS TITLE INSURANCE CORPORATION
COMMITMENT FOR TITLE INSURANCE
FILE NO. 01694702

(1)–(3) NOT SURVEY RELATED – CANNOT BE PLOTTED

(4) THE EFFECT OF A MAP PURPORTING TO SHOW A RIGHT OF WAY FOR ROAD RECORDED IN:
BOOK 1 OF ROAD MAPS
PAGE 49
OVER WEST 33' OF SECTIONS 27 & 34

(5) THE EFFECT OF A MAP PURPORTING TO SHOW A RIGHT OF WAY FOR ROAD RECORDED IN:
BOOK 2 OF ROAD MAPS
PAGE 70
OVER SOUTH 33' OF SECTION 25
PORTIONS OF SAID ROAD MAP AFFECTING SECTIONS 26, 27, 34 & 35 WERE ABANDONED IN A RESOLUTION RECORDED IN DKT. 10767, PG. 651 & IN RESOLUTION RECORDED IN DKT. 15942, PG. 213.

(6)–(8) NOT RELATED TO CURRENT SURVEY

(9) EASEMENT & RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT:
RECORDED IN DKT. 5462
PAGE 356
PURPOSE ROAD & HIGHWAY

(10) NOT RELATED TO CURRENT SURVEY

(11) EASEMENT & RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT:
RECORDED IN DKT. 6283
PAGE 150
PURPOSE FLOOD CONTROL PURPOSES

(12)–(13) NOT RELATED TO CURRENT SURVEY

(14) EASEMENT & RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT:
RECORDED IN DKT. 11112
PAGE 962
PURPOSE ROAD & HIGHWAY
THEREAFTER PORTIONS OF SAID EASEMENT WERE ABANDONED IN INSTRUMENT RECORDED IN DKT. 15942, PG. 213.

(15) EASEMENT & RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT:
RECORDED IN DKT. 12368
PAGE 458
PURPOSE ROAD & HIGHWAY

(16)–(18) NOT RELATED TO CURRENT SURVEY

(19) EASEMENT & RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT:
RECORDED IN DKT. 15111
PAGE 1021
PURPOSE POLE LINES

(20) NOT RELATED TO CURRENT SURVEY

(21) EASEMENT & RIGHTS INCIDENT THERETO, AS SET FORTH IN INSTRUMENT:
RECORDED IN DOC. NO. 92-0713468
PURPOSE ROAD & HIGHWAY

(22) NOT RELATED TO CURRENT SURVEY

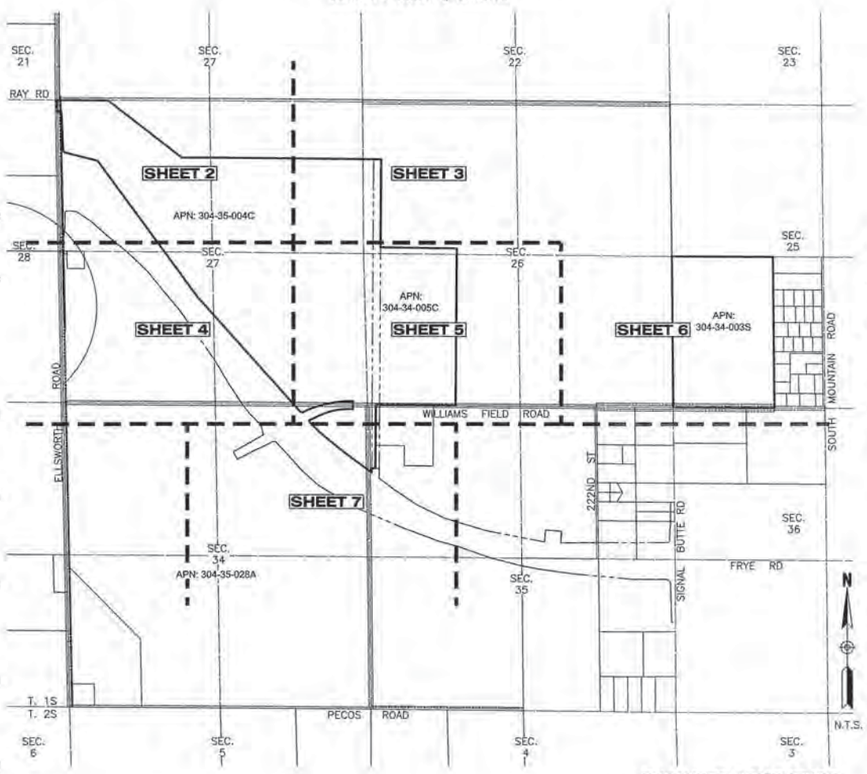
(23) MATTERS CONTAINS IN A RESOLUTION OF THE MARICOPA COUNTY BOARD OF SUPERVISORS, AND THEREAFTER MAP OF ROADWAY DESIGNATION BY THE MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION, WHICH AMONG OTHER THINGS, DECLARES A COUNTY HIGHWAY RECORDED IN:
DOC. NO. 03-0380780
DOC. NO. 04-0641345
OVER THE SOUTH 65' OF PARCEL 2

(24)–(31) NOT RELATED TO CURRENT SURVEY

(32) CATV PEDISTAL ON SHEET 5 OF 8 IS WITHOUT AN EASEMENT AS THE "OLD WILLIAMS FIELD ROAD EASEMENT" IN THIS AREA HAS BEEN ABANDONED.

FLOOD INSURANCE RATE MAP INFORMATION

COMMUNITY NUMBER	PANEL #	SUFFIX	PANEL DATE	FIRM ZONE
040037	2695	H	09-30-05	X



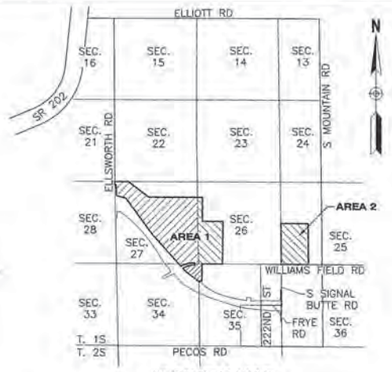
RESTRICTED USE AREA TABLE

** INSTRUMENTS WHERE AREA HAS BEEN NETTED OUT OF GROSS AREA

ITEM #	AREA (SF)	
** (4)	6,777 SF	ELLSWORTH ROAD 33' R/W (SEE SHEET 2)
(5)	57,958 SF	WILLIAMS FIELD ROAD 33' EASEMENT, COVERED BY (23) (SEE SHEET 6)
** (9)	3,481 SF	ELLSWORTH ROAD 17' EASEMENT (SEE SHEETS 2)
(11)	12,319 SF	FLOOD CONTROL EASEMENT (SEE SHEET 2)
** (15)	1,022 SF	ELLSWORTH ROAD 5' EASEMENT (SEE SHEET 2)
(19)	19,589 SF	AFFECTING SEC. 25, POWER LINE (SEE SHEETS 6)
** (21)	2,041 SF	ELLSWORTH ROAD 10' R/W (SEE SHEETS 2)
** (23)	114,139 SF	WILLIAMS FIELD ROAD EASEMENT (SEE SHEET 6)

GROSS/NET AREA TABLE

	GROSS AREA (SF)	GROSS AREA (AC)
PARCEL 1		
APN: 304-35-004C (A PORTION)	14,427,336	331.206
APN: 304-34-005C	4,778,594	109.701
APN: 304-35-028A (A PORTION)	683,522	15.692
	19,889,452	456.599
PARCEL 2		
APN: 304-34-003S	4,603,885	105.691
OVERALL SITE TOTALS	24,493,337 SF	562.290 AC
**INSTRUMENTS WHERE AREA HAS BEEN NETTED OUT OF GROSS AREA	127,460 SF	2.926 AC
NET AREA	24,365,877 SF	559.364 AC



VICINITY MAP

(NOT TO SCALE)

LEGEND

- EASEMENT
- PROPERTY LINE
- RIGHT-OF-WAY
- SECTION LINE
- MATCHLINE
- EXISTING BLOCK WALL
- EXISTING CHAINLINK FENCE
- EXISTING ROADWAY & CURB
- OE EXISTING OVERHEAD ELECTRIC LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING GAS LINE
- FOUND COTTON PICKER SPINDLE (CPS)
- FOUND BRASS CAP (BC)
- FOUND ALUMINUM CAP (AC)
- FOUND REBAR (RBR)
- FOUND BRASS CAP IN HAND HOLE (BCHH)
- FOUND IRON PIPE
- SET 5/8" REBAR WITH CAP STAMPED RLS# 24532
- POWER POLE (PP)
- STREET LIGHT
- GUY WIRE
- ELECTRIC PULL BOX
- ELECTRIC MANHOLE (M/H)
- ELECTRIC HAND HOLE
- BACKFLOW PREVENTION DEVICE (BFPD)
- WATER METER (WM)
- WATER VALVE
- STAND PIPE
- FIRE HYDRANT
- SEWER MANHOLE (M/H)
- GAS VALVE MANHOLE (M/H)
- GAS VALVE
- TELEPHONE PEDESTAL
- AIR RELEASE MANHOLE (M/H)
- STREET SIGN
- TRAFFIC PULL BOX
- BOLLARD
- GRATE
- (R) RECORD
- (M) MEASURED
- P.O.B. POINT OF BEGINNING
- C.O. CONDEMNATION ORDER

ENGINEER / SURVEYOR

ROSENDAHL MILLETT & ASSOCIATES, L.L.C.
252 N. STAPLEY DRIVE
MESA, ARIZONA 85203
TEL (480) 969-8522
FAX (480) 969-3682
PHILLIP WAYNE ROSENDAHL, P.E., R.L.S.
WAYNE@ROSENDAHLMILLETT.COM

BASIS OF BEARING

THE NORTH BOUNDARY LINE OF THE NORTHWEST QUARTER OF SECTION 27.

BEARING SOUTH 89°38'15" EAST

ALTA/ACSM LAND TITLE SURVEY

TO: HARVARD INVESTMENTS, INC A NEVADA CORPORATION;
LAWYERS TITLE INSURANCE CORPORATION A NEBRASKA CORPORATION;
PACIFIC PROVING, LLC, AN ARIZONA LIMITED LIABILITY COMPANY;

THE UNDERSIGNED HEREBY CERTIFIES THAT THIS MAP, DRAWING OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE "MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ ACSM LAND TITLE SURVEYS," JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS IN 2005, AND INCLUDES ITEMS 1, 2, 3, 4, 8, 9, 10, 11b, 13 16, 17 AND 18 OF TABLE A THEREOF. PURSUANT TO THE ACCURACY STANDARDS AS ADOPTED BY THE ALTA AND NSPS AND IN EFFECT ON THE DATE OF THIS CERTIFICATION, UNDERSIGNED FURTHER CERTIFIES THAT IN MY PROFESSIONAL OPINION, AS A LAND SURVEYOR REGISTERED IN THE STATE OF ARIZONA THE RELATIVE POSITIONAL ACCURACY OF THIS SURVEY DOES NOT EXCEED THAT WHICH IS SPECIFIED THEREIN.

IN ADDITION, THE UNDERSIGNED CERTIFIES, WARRANTS AND REPRESENTS THAT:

1. THE SURVEY WORK UPON WHICH THIS MAP, DRAWING OR PLAT IS BASED WAS PERFORMED AT THE SITE AND ON THE GROUND ON 9-30-09 AND 12-17-10 BY THE UNDERSIGNED (OR INDIVIDUALS OTHERWISE SUPERVISED BY THE UNDERSIGNED)

2. EXCEPT AS OTHERWISE EXPRESSLY AND CONSPICUOUSLY SET FORTH IN THIS MAP, DRAWING OR PLAT OF SURVEY, THERE ARE NO GAPS, GORES, STRIPS OR HIATUSES (i) BETWEEN ANY OF THE PARCELS, LOTS, OR SECTIONS OF REAL PROPERTY COMPRISING THE SUBJECT PROPERTY, OR (ii) BETWEEN THE SUBJECT PROPERTY AND THE ADJACENT OR SURROUNDING ROADWAYS, STREETS, AND RIGHTS-OF-WAY.

REGISTERED LAND SURVEYOR — AZ RLS 24532 REGISTRATION NO.

9-30-11
DATE

REV. NO.	DESCRIPTION

POWER ENGINEERING & LAND SURVEYING, LLC
P.E.L.S.
• ENGINEERING • LAND SURVEYING
• URBAN DESIGN • CONSTRUCTION SURVEYING
252 NORTH STAPLEY DRIVE
MESA, ARIZONA 85203
(480) 427-2465 TEL
(480) 969-3682 FAX

ALTA / ACSM LAND TITLE SURVEY

A PORTION OF THE OLD GM PROVING GROUND
MESA, ARIZONA
MARICOPA COUNTY

CLIENT
HARVARD INVESTMENTS
17700 N. PACESETTER WAY
SCOTTSDALE, ARIZONA 85255
TEL 480-348-1118
FAX 480-348-9976

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DESIGN: N/A
DRAWN: NRS

REGISTERED LAND SURVEYOR
24532
PHILLIP W. ROSENDAHL
9-30-11
EXP: 3/31/2012

PROJECT NO. 201117
DATE: 09-30-11

SHEET 1
1 OF 7

P:_PELS_JOBS\2011\201117\dwg\ALTA\ 117-ALTA01.dwg - Sep 30,2011 1:43pm

APN: 304-31-010C
GRUPO AZTEX LTD.
ZONE: AG

APN: 304-34-005D
DMB MESA PROVING GROUNDS LLC.
ZONE: PLANNED COMMUNITY DISTRICT (PC)

APN: 304-34-005D
DMB MESA PROVING GROUNDS LLC.
ZONE: PLANNED COMMUNITY DISTRICT (PC)

ELEC. PULL BOX
CONC. PAD
CHAINLINK FENCE
CONC. PAD W/STREET LIGHT
ELEC. PULL BOX
HEADWALL
STREET LIGHT
GATE
N'LY LIMIT OF (9) & (15) MARICOPA COUNTY DEPT. OF TRANS. MARICOPA COUNTY FLOOD CONTROL
SET REBAR & CAP
CONC. CANAL ±26.85'
HEADWALL
SEWER MANHOLE
SEWER ±71.4'
SEWER MANHOLE
SEWER MANHOLE
MDFCD 40' PER DKT. 6414, PG. 70
SEWER MANHOLE
FD AC 1/4 COR
SEWER MANHOLE
SEWER MANHOLE
SEWER MANHOLE

RAY ROAD ALIGNMENT

S.21 S.22 S.28 S.27 S89°38'15"E(R&M) 876.65'(R) S89°38'15"E(R&M) 2647.00' (BASIS OF BEARING) 1770.35' S.22 S.27 S89°35'50"E 2658.21'

SEE SHEET 3

GUY WIRE
PP
WM
AIR RELEASE M/H
FD BCHH SEC COR
(4) 66' ROADWAY ESMT PER BK. 1, PG. 49; CITY OF MESA
(11) 15' ESMT FOR FLOOD CONTROL PER DKT. 5283, PG. 150 MARICOPA COUNTY FLOOD CONTROL
CITY OF MESA WATER LINE INSIDE OF ELLSWORTH RD RIGHT-OF-WAY
NORTHERLY LIMIT OF PROPOSED SR-24 RIGHT-OF-WAY
WATER ±15.4'
ELEC. M/H
CITY OF MESA SEWER LINE INSIDE OF ELLSWORTH RD RIGHT-OF-WAY
CONC. PAD 2'X3' STORM GRATE
5' ESMT FOR HWY PURPOSES PER (15) DKT. 12388, PG. 458 CITY OF MESA
RETAINING WALL (11.8 L.F.)
ELEC. PULL BOX
CHAINLINK FENCE
STREET SIGN
APN: 304-35-013A
WILLIAMS FIELD GATEWAY AIRPORT AUTHORITY
ZONE: I-1
10' ESMT FOR HWY PURPOSES PER (21) DOC. 92-0713468 CITY OF MESA
ELEC. PULL BOX
SEWER ±13.6'
17' ESMT FOR HWY PURPOSES PER (9) DKT. 5462, PG. 349 CITY OF MESA
CONC. PAD
ELEC. PULL BOX
2'X3' STORM GRATE
RETAINING WALL (12.3 L.F.)
BC ±7.7'
N75°45'39"W 393.43'

LINE DATA TABLE		
LINE	BEARING	DISTANCE
L1	N01°06'21"W	205.8'
L2	S88°53'39"W	67.73'
L3	N39°03'11"W	40.14'

N01°52'44"W 675.54'

S52°18'19"E(R) 1624.90'(R)

987.03'

502.74'

3148.67'(R) S89°29'10"E(R) 3149.43'(M) 2646.69'

SET REBAR & CAP

AREA 1
APN: 304-35-004C
PACIFIC PROVING LLC.
ZONE: R-43

ELLSWORTH ROAD
N01°06'45"W(R) 2627.91'(R)
N01°06'21"W(M) 2627.84'(M)

NORTHERLY BOUNDARY

GAS ±59.6'
ELLSWORTH ROAD 55' R/W

APN: 304-35-011E
WILLIAMS FIELD GATEWAY AIRPORT AUTHORITY
ZONE: I-1

FUTURE STATE ROUTE 24 RIGHT-OF-WAY

EP ±29.4'
(4) 66' ROADWAY ESMT PER BK. 1, PG. 49:

PROPOSED SR-24 RIGHT-OF-WAY
N36°17'25"W 2915.15'

1864.99'

GAS ±59.9'
QUIT CLAIM DEED ESMT PER DOC. 00-0385783 (LIMITED USE)
10' ESMT FOR HWY PURPOSES PER DOC. 92-0713468

APN: 304-35-004C
PACIFIC PROVING LLC.
ZONE: R-43

EP ±37.3'
15' CONDEMNATION ORDER PER DOC. NO. 05-1290333

1645.29'
N01°03'14"W 5261.54'

AREA 1
APN: 304-35-004C
PACIFIC PROVING LLC.
ZONE: R-43

SEE SHEET 4

SEE SHEET 4

SEE SHEET 3

REV. NO.	DESCRIPTION

POWER ENGINEERING & LAND SURVEYING, LLC
P.E.L.S.
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• URBAN DESIGN
• LAND SURVEYING
• CONSTRUCTION SURVEYING
202 NORTH 1ST APLEY DRIVE
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(480) 999-5882 FAX

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MARICOPA COUNTY

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HARVARD INVESTMENTS
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SCOTTSDALE, ARIZONA 85255
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MARICOPA COUNTY 602-263-1100
1-800-STAKE-IT
www.azbluestake.com

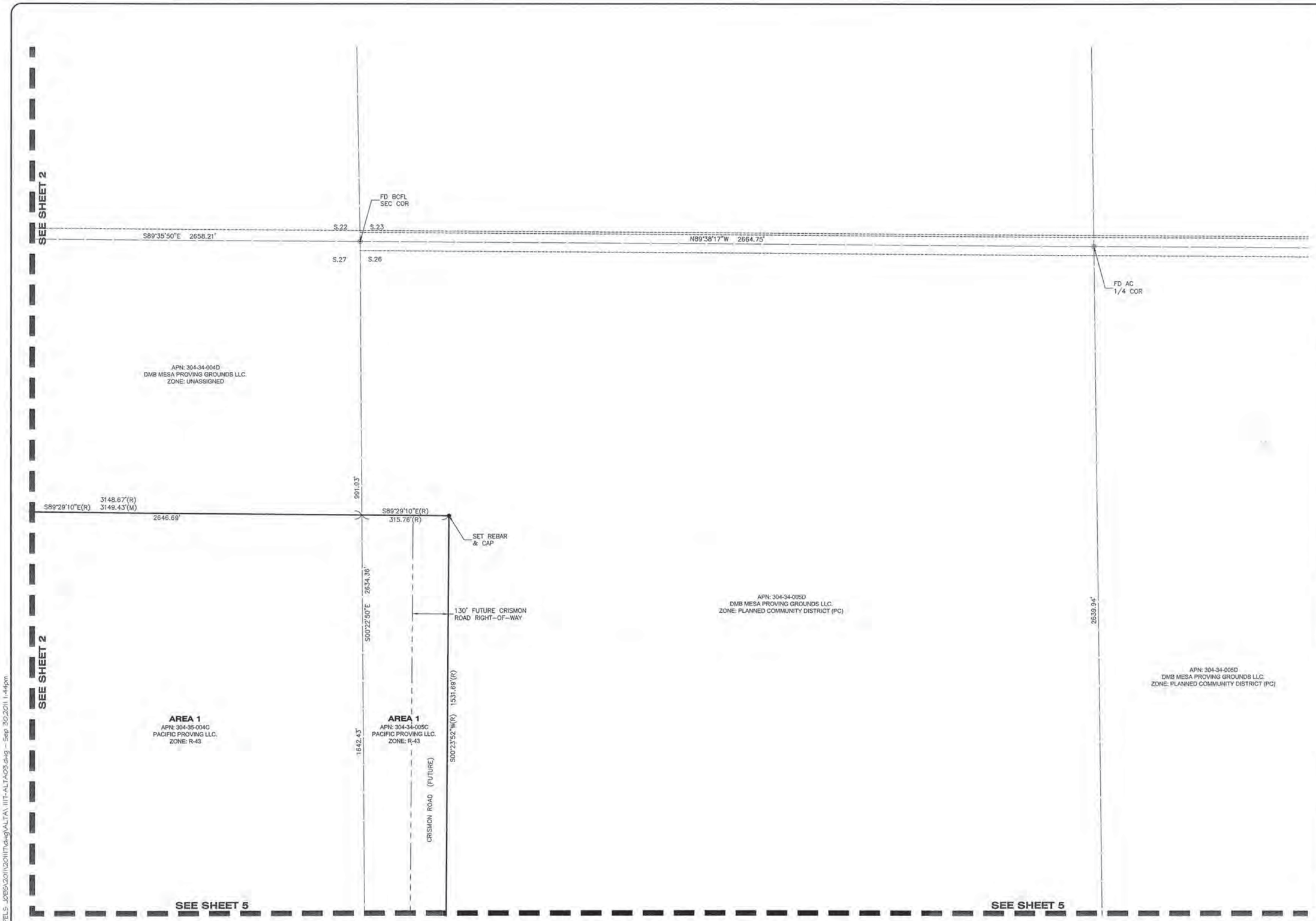
DESIGN: N/A
DRAWN: NRS

REGISTERED Land Surveyor
CERTIFICATE NO.
24532
PHILLIP W. ROSENDAHL
9-30-11
ARIZONA U.S.A.
EXP: 3/31/2012

PROJECT NO. 201117
DATE: 09-30-11

SHEET
2
2 OF 7

P:_PELS_JOBS\2011\201117\dwg\ALTA\ IIT-ALTA02.dwg - Sep 30,2011 1:43pm



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REV. NO. | DESCRIPTION

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▸ ENGINEERING
▸ URBAN DESIGN
▸ LAND SURVEYING
▸ CONSTRUCTION SURVEYING
250 NORTH STAPLEY DRIVE
MESA, ARIZONA 85203
(480) 497-5466 TEL
(480) 986-3882 FAX

ALTA / ACSM LAND TITLE SURVEY

A PORTION OF THE OLD GM PROVING GROUND
MESA, ARIZONA
MARICOPA COUNTY

CLIENT
HARVARD INVESTMENTS
17700 N. PACESETTER WAY
SCOTTSDALE, ARIZONA 85255
TEL 480-348-1118
FAX 480-348-6976

CALL 2 WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT

DESIGN: N/A
DRAWN: NRS

Registered Land Surveyor
CERTIFICATE NO.
24532
PHILLIP W. ROSENDAHL
9-30-11
ARIZONA U.S.A.

EXP: 3/31/2012

PROJECT NO.
201117

DATE: 09-30-11

SHEET
3
3 OF 7

SEE SHEET 2

SEE SHEET 2

SEE SHEET 5

SEE SHEET 5

SEE SHEET 6

BC ±4.7'
BC ±3.1'
EP ±4.2'

QUIT CLAIM DEED ESMT PER DOC. 00-0385783 (LIMITED USE)

FD BCHH W1/4 S.27

50' WIDE TEMPORARY ACCESS EASEMENT

300' X 300' SRP ELECTRICAL SUBSTATION LOCATION PER BK. 1050, PG. 28

EP ±36.9'

EP ±28.4'

CHAINLINK FENCE

17' ESMT FOR HWY PURPOSES PER DKT. 5575, PG. 332

66' ROADWAY ESMT PER BK. 1, PG. 49;

5' ESMT FOR HWY PURPOSES PER DKT. 12368, PG. 458

WATER ±23'

65' ELLSWORTH ROAD R/W

GAS ±52.8'

10' CONDEMNATION ORDER PER DOC. NO. 2005-1290333

APN: 304-35-017B
WILLIAMS FIELD GATEWAY AIRPORT AUTHORITY
ZONE: I-1

ELLSWORTH ROAD

N01°06'53"W(R) 2628.52'(R)
N01°06'35"W(M) 2629.09'(M)

BC ±7.9'

22' ESMT FOR HWY PURPOSES PER DKT. 5462, PG. 349

55' ELLSWORTH ROAD R/W

SAFETY AREA ESMT PER DKT. 12949, PG. 199

36" CMP (32 L.F.)

36" CMP (32 L.F.)

66' FLOOD CONTROL ESMT PER DKT. 3973, PG. 463

RETAINING WALL

RETAINING WALL

APN: 304-35-004C
PACIFIC PROVING LLC.
ZONE: R-43

2644.74'

N89°32'22"W

5272.05'

5261.54'

CNTR 1/4 SEC 27

2627.31'

1964.96'

N36°12'25"W 2915.15'

950.19'

FUTURE STATE ROUTE 24 RIGHT-OF-WAY

457.15'

NORTHERLY BOUNDARY

N41°45'20"W 2702.96'

2084.36'

PROPOSED SR-24 RIGHT-OF-WAY

FUTURE STATE ROUTE 24 RIGHT-OF-WAY

N01°03'14"W

2629.23'

AREA 1
APN: 304-35-004C
PACIFIC PROVING LLC
ZONE: R-43

66' ROADWAY ESMT PER BK. 2, PG. 70; (5)(14) ABANDONED PER DKT. 10787, PG. 651

FD BCHH SEC COR

S.28 S.27

S.33 S.34

WILLIAMS FIELD ROAD ALIGNMENT

APN: 304-35-025A
WILLIAMS FIELD GATEWAY AIRPORT AUTHORITY
ZONE: I-1

33' ESMT FOR HWY PURPOSES PER DKT. 11112, PG. 0962

22' ESMT FOR HWY PURPOSES PER DKT. 5432, PG. 264

CHAINLINK FENCE

EP ±34.8'

N89°32'05"W 2642.17'

S.27

462.86'

S.34

896.92'

S89°29'00"E 2644.43'

FD AC 1/4 COR

APN: 304-35-028A
PACIFIC PROVING LLC.
ZONE: R-43

APN: 304-35-028A
PACIFIC PROVING LLC.
ZONE: R-43

REV. NO.	DESCRIPTION

POWER ENGINEERING & LAND SURVEYING, LLC

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• LAND SURVEYING
• CONSTRUCTION SURVEYING

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DESIGN: N/A
DRAWN: NRS

Registered Land Surveyor
CERTIFICATE NO.
24532
PHILLIP W. ROSENDAHL
9-30-11
EXP: 3/31/2012

PROJECT NO.
201117

DATE: 09-30-11

SHEET
4
4 OF 7

P:_PELS JOBS\2011\2011\dwg\ALTA\ 11IT-ALTAC4.dwg - Sep 30,2011 1:44pm

SEE SHEET 3

SEE SHEET 3

SEE SHEET 4

SEE SHEET 6

N89°32'22"W 5272.05' 2627.31'

S00°23'52"W(R) 1531.69'(R)

S89°13'23"E(R) 1323.72'(R)

SET REBAR & CAP

SET REBAR & CAP

CNTR 1/4 SEC. 26

5266.37'

N89°31'28"W 5346.35' 2665.34'

S00°43'54"E

S.27

S.26

FD GLO BC 1/4 COR

1617.00'

103.39'

1064.02'

130' FUTURE CRISMON ROAD RIGHT-OF-WAY

CRISMON ROAD (FUTURE)

S01°25'29"E 2632.43'

2627.97'

S00°28'40"W(R) 2731.36'(M) 2730.34'(R)

2626.42'

AREA 1
APN: 304-35-004C
PACIFIC PROVING LLC.
ZONE: R-43

AREA 1
APN: 304-34-005C
PACIFIC PROVING LLC.
ZONE: R-43

APN: 304-34-005D
DMB MESA PROVING GROUNDS LLC.
ZONE: PLANNED COMMUNITY DISTRICT (PC)

APN: 304-34-005D
DMB MESA PROVING GROUNDS LLC.
ZONE: PLANNED COMMUNITY DISTRICT (PC)

LINE DATA TABLE		
LINE	BEARING	DISTANCE
L4	N80°12'45"W	39.15'
L5	S63°49'31"W	125.36'
L6	S71°15'43"W	131.23'
L7	N00°34'55"E	138.76'
L8	N64°48'20"E	191.85'
L9	N08°21'48"E	30.47'

CURVE DATA TABLE					
CURVE	DELTA	RADIUS	ARC	CHORD BEARING	CHORD
C1	19°47'46"	1861.15'	643.04'	S81°09'36"W	639.85'
C2	28°39'37"	1178.53'	589.52'	S79°08'09"W	583.4'

66' ROADWAY ESMT PER BK. 2, PG. 70; (5)(14) ABANDONED PER DKT. 10767, PG. 651

529.72' S89°29'00"E 2644.43'

L4 L5 L6 L7 L8 L9

C1 C2

FUTURE STATE ROUTE 24 RIGHT-OF-WAY

AREA 1
APN: 304-35-028A
PACIFIC PROVING LLC.
ZONE: R-43

FD BC SEC COR

S.26 S.27 S.34 S.35

256.8' 144.73' 498.13'

N89°38'00"W 1384.87'

999.78'

130' FUTURE CRISMON ROAD RIGHT-OF-WAY

33' ESMT FOR HWY PURPOSES PER DKT. 11112, PG. 0962 (14) ABANDONED PER DKT. 15942, PG. 213

N'LY LIMIT OF (14)

33' ESMT FOR HWY PURPOSES PER (14) DKT. 11112, PG. 0962 ABANDONED PER DKT. 15942, PG. 213

1101.51' S00°41'42"E 1098.28' S00°23'52"W 700.22'

66' ROADWAY ESMT ABANDONED PER DKT. 15942, PG. 213

EXCLUDED PARCEL

SET REBAR & CAP

385.09'

66' ROADWAY ESMT PER BK. 2, PG. 70; (5)(14) ABANDONED PER DKT. 15942, PG. 213

1050.45' S00°25'44"W

APN: 304-34-014A
PACIFIC PROVING LLC.
ZONE: R-43

FD AC 1/4 COR

S89°38'16"E(R) S89°38'00"E(M) 1119.45'(M) 1119.29'(R)

S89°33'25"E(R) S89°33'17"E(M) 2650.77' 1325.38'(M) 1325.14'(R)

66' ROADWAY ESMT PER BK. 2, PG. 70; (5) ABANDONED PER DKT. 15942, PG. 213

CABLE TV PEDESTAL NO RECORDED EASEMENT PROVIDED (32)

APN: 304-34-014A
PACIFIC PROVING LLC.
ZONE: R-43

SEE SHEET 7

SEE SHEET 6

P:_PELS JOBS\2011\201117\dwg\ALTA\ 1117-ALTA05.dwg - Sep 30,2011 11:44pm

REV. NO.	DESCRIPTION

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222 NORTH STAPLEY DRIVE MESA, ARIZONA 85203
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A PORTION OF THE OLD GM PROVING GROUND
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MARICOPA COUNTY

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www.azbluestake.com
1-800-STAKE-IT

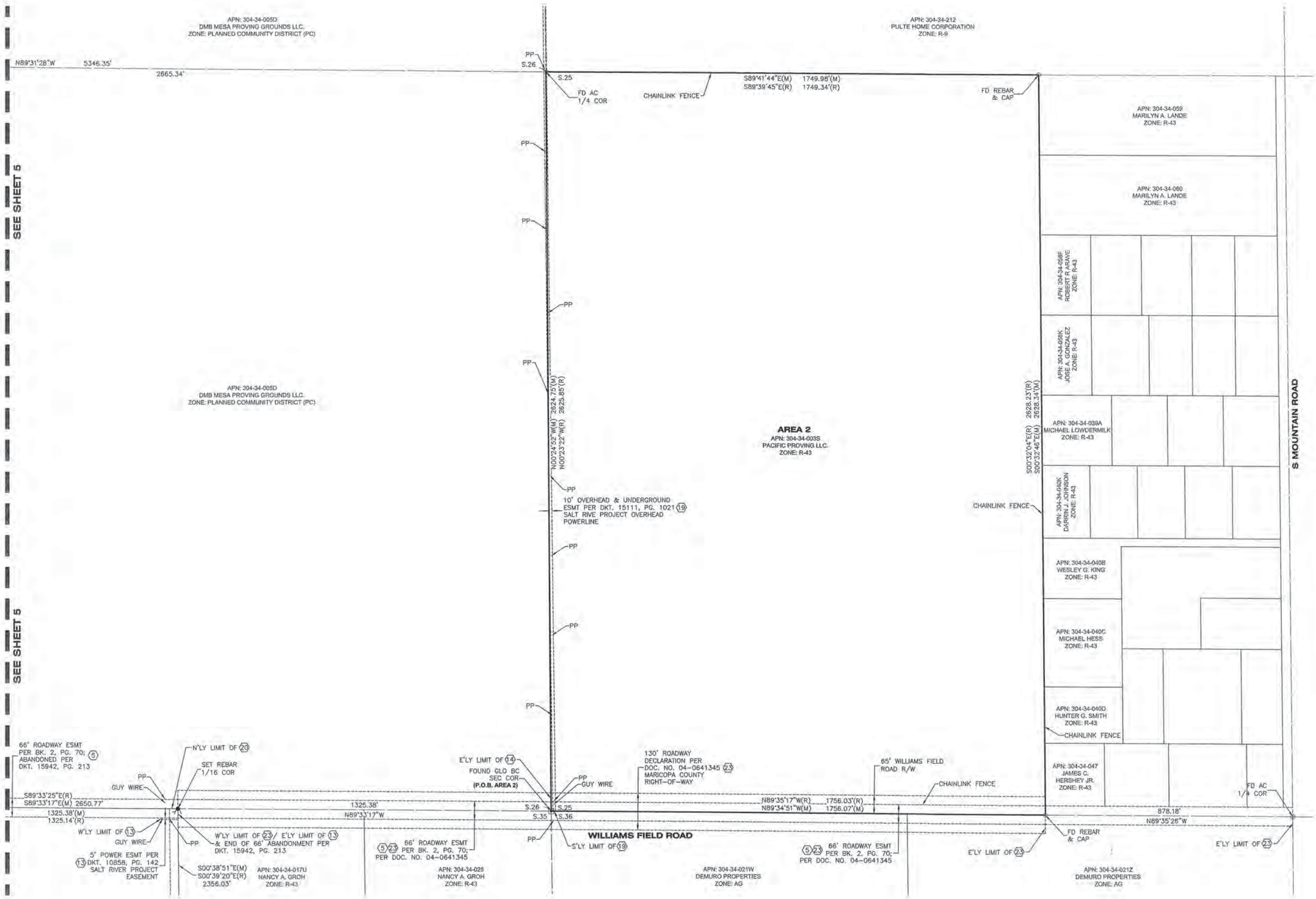
DESIGN: N/A
DRAWN: NRS

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
84532
PHILLIP W. ROSENDAHL
9-30-11
EXP: 3/31/2012

PROJECT NO.
201117

DATE: 09-30-11

SHEET
5
5 OF 7



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REV. NO.	DESCRIPTION

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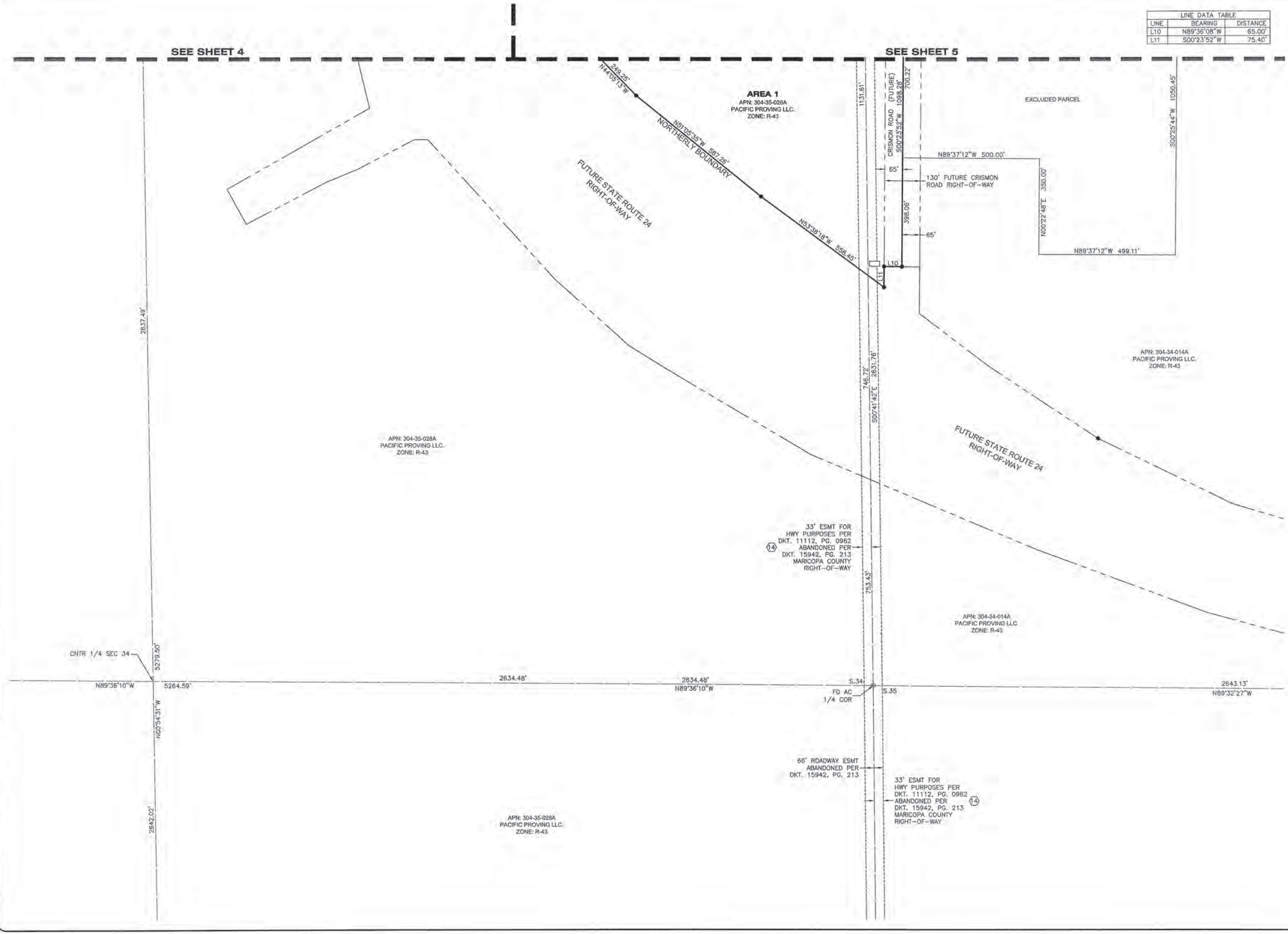
www.azblue stake.com

DESIGN: N/A
DRAWN: NRS

REGISTERED Land Surveyor
CERTIFICATE NO.
24532
PHILLIP W. ROSENDAHL
9-30-11
ARIZONA U.S.A.
EXP: 3/31/2012

PROJECT NO.
201117
DATE: 09-30-11

SHEET
6
6 OF 7



REV. NO. | DESCRIPTION

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www.azbluestake.com

DESIGN: N/A
DRAWN: NRS

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
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9-30-11
ARIZONA U.S.A.
EXP: 3/31/2012

PROJECT NO.
201117
DATE: 09-30-11

SHEET
7
7 OF 7

F:_PELS_JOBS\2011\201117\dwg\ALTA\ 1117-ALTACT.dwg - Sep 30,2011 1:45pm

EXHIBIT 3

DMB MESA PROVING GROUNDS MASTER SEWER EXHIBIT

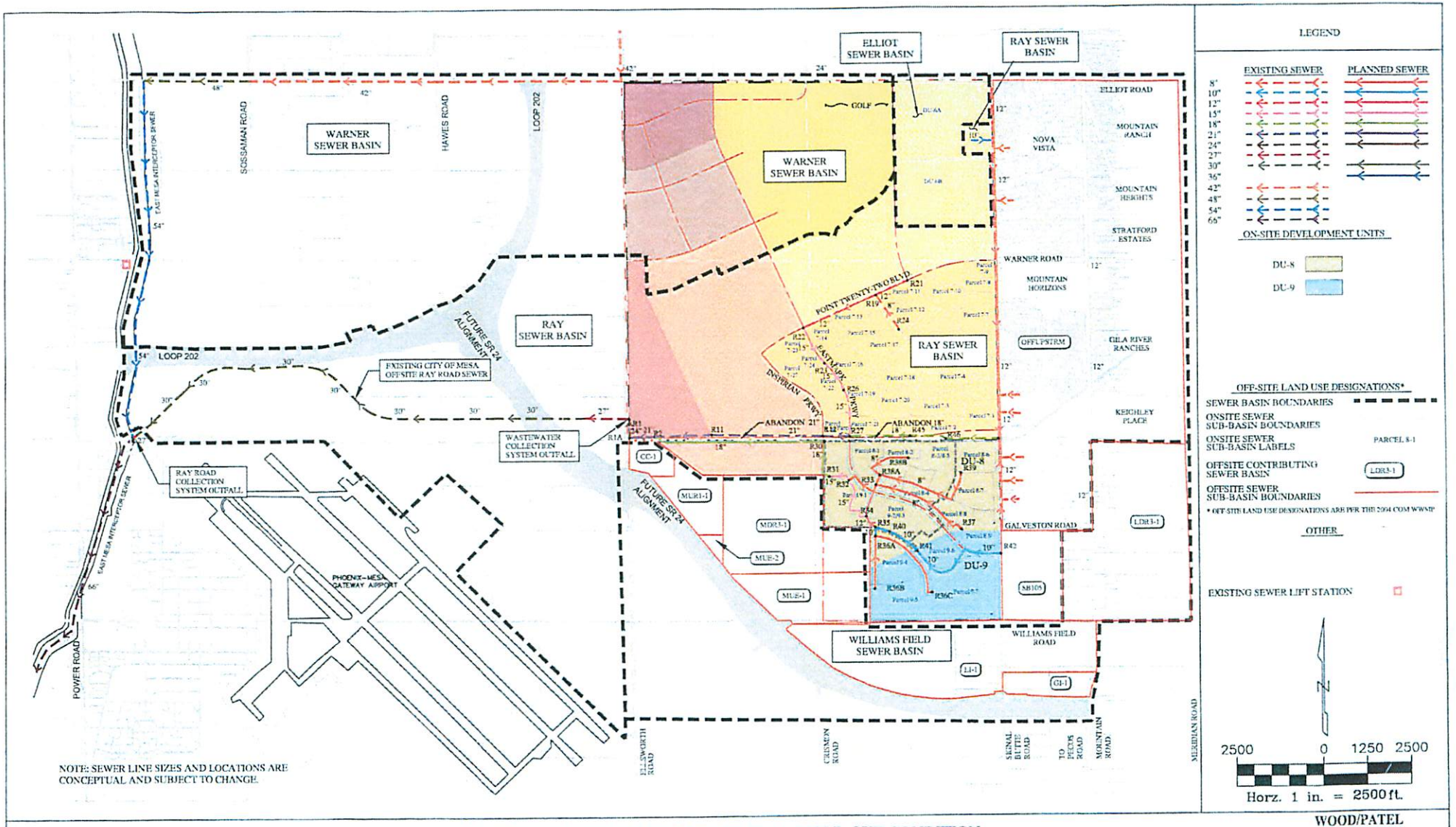


PLATE 2 - MASTER SEWER EXHIBIT, FULL BUILD OUT CONDITION

EASTMARK
MESA, ARIZONA

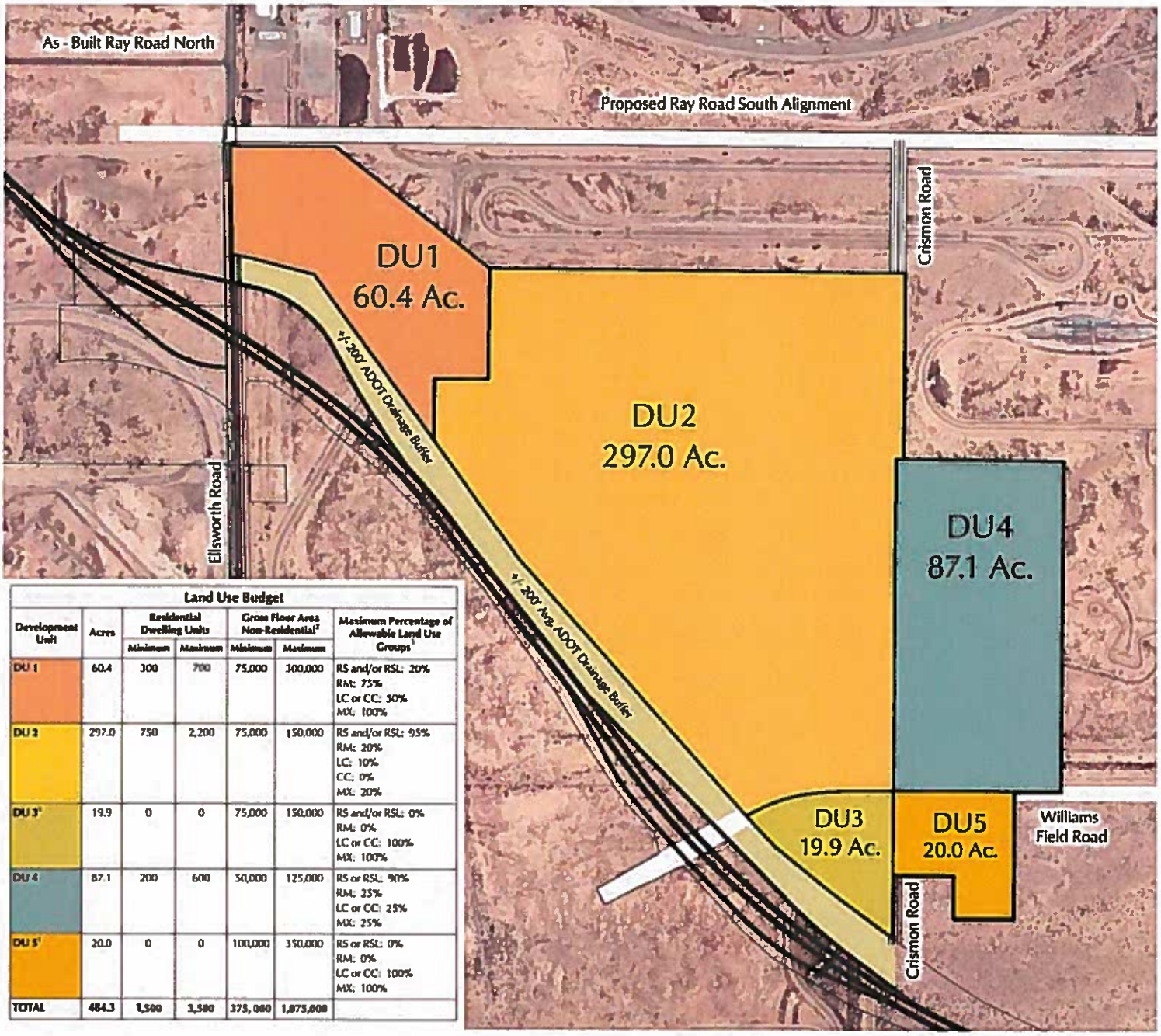
PRELIMINARY
NOT FOR CONSTRUCTION
OR RECORDING

WOOD/PATEL
2220 South Country Club Drive
Suite 101
Mesa, AZ 85210
(480) 834-3300

R:\Mesa Proving Grounds\2012\125655.04\Project Support\Reports\DU 8 & 9 Master Wastewater Update\Exhibits\ 5655_04-Plate 2 - Master Sewer Exhibit - PBO.dwg - Jan 14,2014 2:54pm

EXHIBIT 4

PACIFIC PROVING GROUNDS CONCEPTUAL FRAMEWORK PLAN



Land Use Budget

Development Unit	Acres	Residential Dwelling Units		Gross Floor Area Non-Residential[2]		Maximum Percentage of Allowable Land Use Groups[3]
		Minimum	Maximum	Minimum	Maximum	
DU 1	60.4	300	700	75,000	300,000	RS and/or RSL: 20% RM: 75% LC or CC: 50% MX: 100%
DU 2	297.0	750	2,200	75,000	150,000	RS and/or RSL: 95% RM: 20% LC: 10% CC: 0% MX: 20%
DU 3[4]	19.9	0	0	75,000	150,000	RS and/or RSL: 0% RM: 0% LC or CC: 100% MX: 100%
DU 4	87.1	200	600	50,000	125,000	RS or RSL: 90% RM: 25% LC or CC: 25% MX: 25%
DU 5[4]	20.0	0	0	100,000	350,000	RS or RSL: 0% RM: 0% LC or CC: 100% MX: 100%
TOTAL	484.3	1,500	3,500	375,000	1,075,000	

Development Unit Plan

M E S A , A R I Z O N A

PACIFIC PROVING GROUNDS NORTH

EXHIBIT 5

CITY OF MESA GATEWAY AREA SEWER IMPROVEMENTS MASTER PLAN

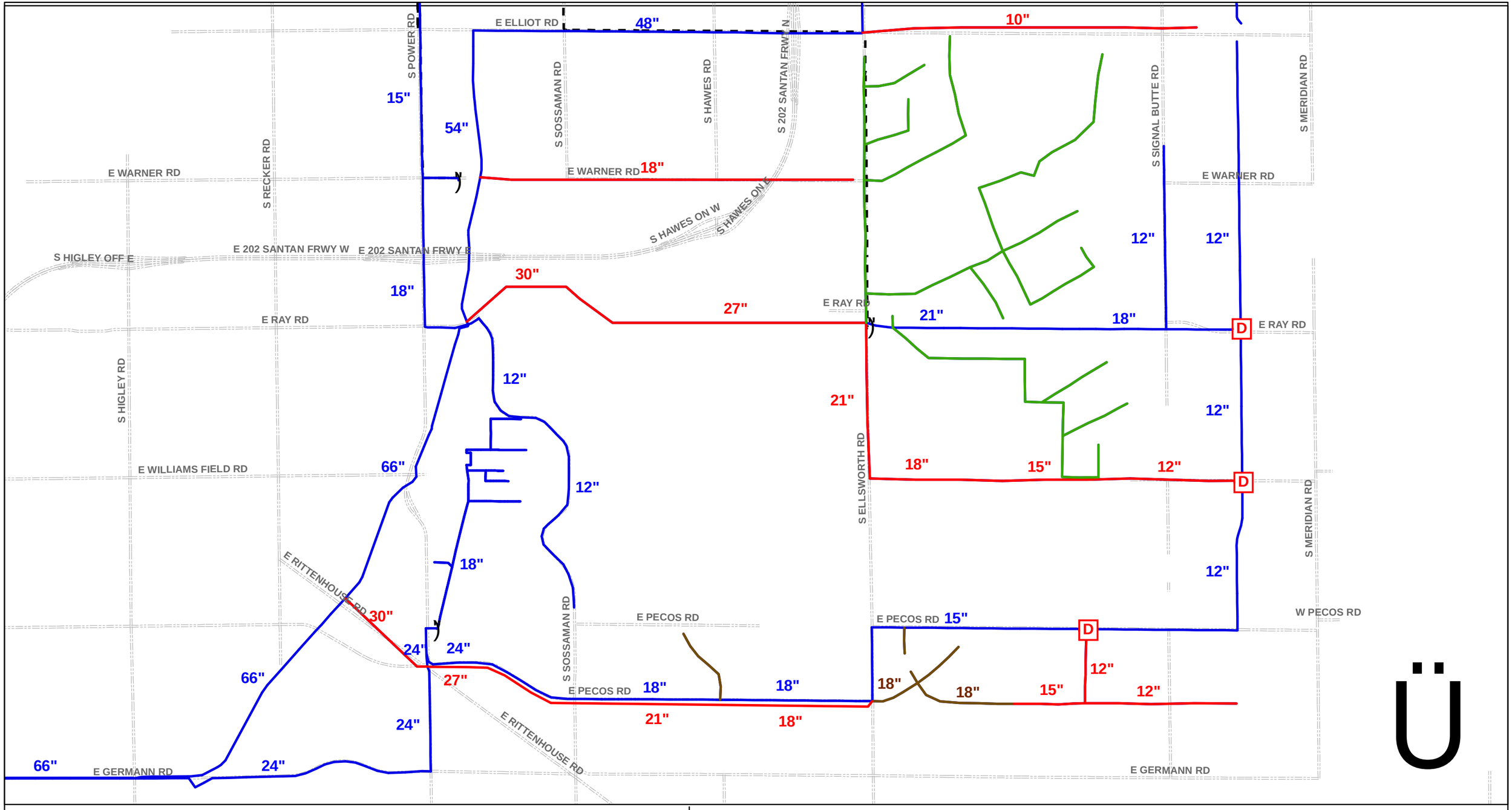


FIGURE 1
City of Mesa
Gateway Area Sewer Improvements

January 2009

EXHIBIT 6

EXISTING WILLIAMS FIELD SEWER BASIN

I I-007

E RAY RD

27"

21"

18"

12"

12"

D

E RAY RD

21"

12"

18"

15"

12"

D

WILLIAMS FIELD RD

S ELLSWORTH RD

S MERIDIAN RD

12"

COS RD

E PECOS RD

15"

D

W PECOS RD

12"

18"

18"

18"

15"

12"

18"

AN EXCERPT FROM: "FIGURE 1" CITY OF MESA GATEWAY AREA SEWER IMPROVEMENTS JANUARY 2009. SEE EXHIBIT 5.

E GERMANN RD

NORTH

SCALE: 1"=2000'

eps group, Inc.
Engineers, Planners & Surveyors
2045 S. Vineyard, Ste. 101, Mesa, Arizona 85210
Phone (480) 503-2250 Fax (480) 503-2258

Project: PACIFIC PROVING GROUNDS NORTH
Mesa, Arizona

EXISTING SEWER BASIN EXHIBIT

Job No. I I-007

Designer: BAN
Drawn by: BAN

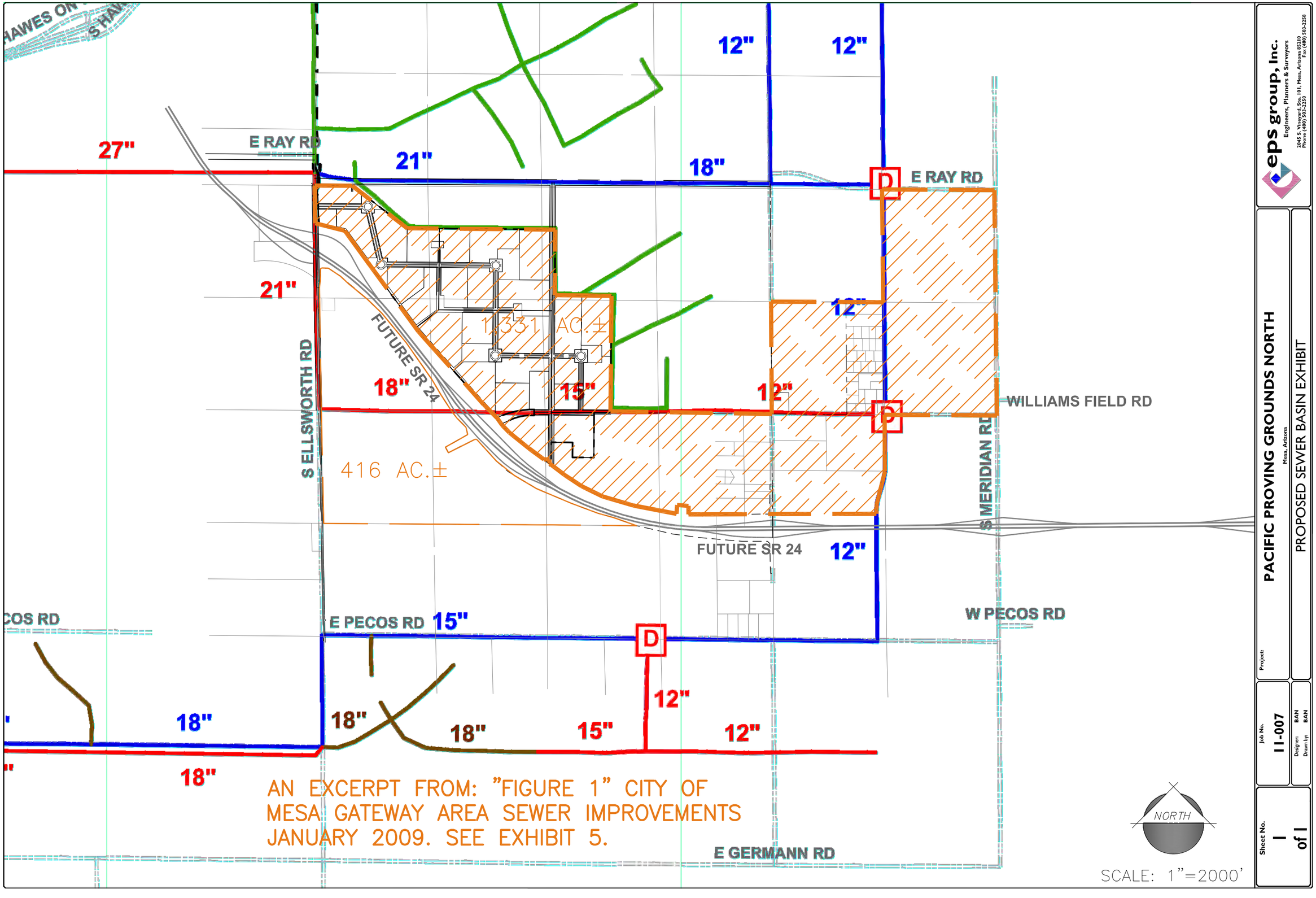
Sheet No. 1 of 1

EXHIBIT 7

ADJUSTED WILLIAMS FIELD SEWER BASIN

and

ALTERNATE WILLIAMS FIELD ROAD SEWER ALIGNMENT



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PACIFIC PROVING GROUNDS NORTH
Mesa, Arizona

Project: PROPOSED SEWER BASIN EXHIBIT

Job No. 11-007
Designer: BAN
Drawn by: BAN

Sheet No. 1 of 1

11-007

EXHIBIT 8

UNIT SEWER DEMANDS – AVERAGE DAY
SEWER DEMANDS – AVERAGE DAY

Unit Sewer Demands - Average Day

Project:	Pacific Proving Grounds North - Master Sewer Study		
Prepared by:	John McGhee, PE	**Date:**	7/30/2014

*Summary of City of Mesa Design Criteria

C.O.M. Land Use Classification	Population Density	Units	Unit Demand (GPD / AC)	C.O.M. Defined D.U. / Ac	Assumed D.U. / Ac	Description
BP	8	emp/ac	54	N/A	N/A	Business Park
Com	14	emp/ac	54	N/A	N/A	Commercial
EDU	15	emp/ac	54	N/A	N/A	Educational
ER	3	per d.u.	80	1-2	1.5	Low Density Residential
GI	15	emp/ac	54	N/A	N/A	General Industrial
HDR	1.7	per d.u.	80	15+	20	High Density Residential
LDR	3	per d.u.	80	2-4	3	Medium Density Residential
LI	7	emp/ac	54	N/A	N/A	Light Industrial
LMDR	3.2	per d.u.	80	4-6	5	Medium Density Residential
MDR	2.7	per d.u.	80	6-10	8	Medium Density Residential
MHDR	2	per d.u.	80	10-15	12.5	High Density Residential
MUR	1.7	per d.u.	80	N/A	12.5	Mixed Use Residential

Sewer Demands - Average Day

Project: Pacific Proving Grounds North - Master Sewer Study

Prepared by: John McGhee, PE **Date:** 8/18/2014

	PPGN Residential Parcels			Other PPGN Parcels and Offsite Areas						Average Day Demands	
Parcel ID	Assumed D.U.	Population Density	Unit Demand (GPD/DU)	C.O.M. Land Use Class	Area[1] (acre)	Population Density	Units	Unit Demand (GPD)	Assumed D.U. / Ac	Average Day Flow (GPD)	Average Day Flow (MGD)
DU1-A				Com	10.8	14.0	emp/ac	54	N/A	8,165	0.008
DU1-B				Com	4.3	14.0	emp/ac	54	N/A	3,251	0.003
DU1-C				Com	15.3	14.0	emp/ac	54	N/A	11,567	0.012
DU1-D	458	1.7	80							62,288	0.062
DU2-A	129	2.7	80							27,821	0.028
DU2-B	130	2.7	80							28,166	0.028
DU2-C	136	2.7	80							29,376	0.029
DU2-D	122	2.7	80							26,438	0.026
DU2-E	163	2.7	80							35,251	0.035
DU2-F	190	2.7	80							40,954	0.041
DU2-G	200	2.7	80							43,200	0.043
DU2-H	124	2.7	80							26,784	0.027
DU2-I	130	2.7	80							28,166	0.028
DU2-J	193	2.7	80							41,645	0.042
DU2-K	146	2.7	80							31,622	0.032
DU2-L				EDU	12.1	15.0	emp/ac	54	N/A	9,801	0.010
DU2-M	238	2.7	80							51,322	0.051
DU2-N	136	2.7	80							29,376	0.029
DU2-O	126	2.7	80							27,302	0.027
DU2-P				Com	9.4	14.0	emp/ac	54	N/A	7,106	0.007
DU3-A				Com	16.1	14.0	emp/ac	54	N/A	12,172	0.012
DU4-A				Com	7.7	14.0	emp/ac	54	N/A	5,821	0.006
DU4-B	74	2.7	80							16,070	0.016
DU4-C	187	2.7	80							40,435	0.040
DU4-D	193	2.7	80							41,645	0.042
DU4-E	166	2.7	80							35,942	0.036
DU5-A				COM	16.2	14.0	emp/ac	54	N/A	12,247	0.012
Offsite 1				LI	89.9	7.0	emp/ac	54	N/A	33,982	0.034
Offsite 2				LI	68.8	7.0	emp/ac	54	N/A	26,006	0.026
Offsite 3				LI	110.7	7.0	emp/ac	54	N/A	41,845	0.042
Offsite 4				GI	100.2	15.0	emp/ac	54	N/A	81,162	0.081
Offsite 5 [2]				LDR	105.9	3.0	per d.u.	80	3.0	0	0.000
Offsite 6				LDR	53.0	3.0	per d.u.	80	3.0	38,160	0.038
Offsite 7				ER	158.7	3.0	per d.u.	80	1.5	57,132	0.057
Offsite 8				ER	158.9	3.0	per d.u.	80	1.5	57,204	0.057
Total										**1,069,426**	**1.07**

[1] Areas have been reduced from those in the the Land Use Budget to account for right of way and open space areas

[2] Offsite 5, which includes SB105, has been removed from this study. The Eastmark Master Sewer report (Prepared by Wood Patel & Assoc., Inc., dated 1/15/2014) was revised to capture Offsite 5, which is now sewered to the Ray Road sewerline.

EXHIBIT 9

PEAK DAILY SEWER FLOWS AND PIPE CAPACITY

Peak Daily Sewer Flows (Wet Weather) and Pipe Capacity Using Manning's Equation

Project: Pacific Proving Grounds North - Master Sewer Study

Prepared by: John McGhee, PE **Date:** 8/18/2014

Sewer Pipe Information										Flow Information		Peak Demand Information					Full Flow Check		Non-Pressurized Flow Calculations					
up-stream Node	Down-stream Node	Length (ft)	Pipe Diameter (in)	Upstream Invert	Downstream Invert	Slope (ft/ft)	Manning's Roughness	Upstream Manhole Rim Elevation	Cover at Upstream Manhole	Additional Contributing Parcels	Additional Estimated Daily Flow (GPD)	Cumulative Daily Flow (GPD)	Peaking Factor	Peak Demand (GPD)	Peak Demand (MGD)	Peak Demand (cfs)	Full Flow Capacity (cfs)	Pressurized Flow?	Theta of flow (rad)	Depth of Flow (ft)	Percent Full (d/D)	Area of Flow (ft^2)	Wetted Perimeter of flow (ft)	Velocity of Flow (fps)
21	20	2657	10	1429.38	1418.22	0.0042	0.013	1448.62	20.1	Offsite 7, 8	114,336	114,336	3.0	343,008	0.343	0.531	1.42	NO	2.83	0.35	42%	0.2193	1.180	2.42
20	19	874	10	1418.12	1414.45	0.0042	0.013	1446.55	29.3	Offsite 6	38,160	152,496	3.0	457,488	0.457	0.708	1.42	NO	3.13	0.42	50%	0.2715	1.306	2.61
19	18	1756	15	1414.03	1409.11	0.0028	0.013	1441.91	29.1	Offsite 4 **	81,162	233,658	3.0	700,974	0.701	1.085	3.43	NO	2.68	0.48	39%	0.4378	1.677	2.48
18	17	1341	15	1409.01	1405.26	0.0028	0.013	1431.83	24.1	Offsite 3	41,845	275,503	3.0	826,508	0.827	1.279	3.43	NO	2.83	0.53	42%	0.4939	1.770	2.59
17	16	1233	15	1405.16	1401.71	0.0028	0.013	1426.44	22.5	Offsite 2	26,006	301,509	3.0	904,527	0.905	1.400	3.43	NO	2.92	0.56	44%	0.5278	1.826	2.65
16	15	987	15	1401.61	1398.84	0.0028	0.013	1421.99	21.6	---	---	301,509	3.0	904,527	0.905	1.400	3.43	NO	2.92	0.56	44%	0.5278	1.826	2.65
15	14	910	15	1398.74	1396.19	0.0028	0.013	1417.41	19.9	Offsite 1	33,982	335,491	3.0	1,006,474	1.006	1.557	3.43	NO	3.03	0.59	47%	0.5713	1.896	2.73
14	13	697	15	1396.09	1394.14	0.0028	0.013	1413.24	18.4	DU5-A	12,247	347,738	3.0	1,043,215	1.043	1.614	3.43	NO	3.07	0.60	48%	0.5867	1.920	2.75
13	12	1320	15	1394.04	1391.93	0.0016	0.013	1404	11.2	DU2-P, DU3-A, DU4-A, DU4-B, DU4-E	77,112	424,850	3.0	1,274,551	1.275	1.972	2.59	NO	3.76	0.82	65%	0.8487	2.352	2.32
12	11	1320	18	1391.68	1389.57	0.0016	0.013	1411.82	21.6	DU2-K, DU2-N, DU2-O, DU4-C, DU4-D	170,381	595,231	3.0	1,785,694	1.786	2.763	4.21	NO	3.51	0.89	59%	1.0864	2.630	2.54
11	10	1068	18	1389.47	1387.76	0.0016	0.013	1406.37	18.4	DU2-J, DU2-L, DU2-M	102,767	697,999	3.0	2,093,996	2.094	3.240	4.21	NO	3.78	0.99	66%	1.2322	2.837	2.63
10	9	1037	18	1387.66	1385.86	0.0017	0.013	1408.55	22.4	DU2-F, DU2-G	84,154	782,152	3.0	2,346,457	2.346	3.631	4.39	NO	3.94	1.04	67%	1.3082	2.953	2.78
9	8	638	21	1385.61	1383.98	0.0026	0.013	1411.75	27.9	DU2-E, DU2-H	62,035	844,187	3.0	2,532,562	2.533	3.918	8.03	NO	3.11	0.86	49%	1.1808	2.724	3.32
8	7	678	21	1383.98	1382.45	0.0023	0.013	1410.69	28.5	DU2-D, DU2-I	54,605	898,792	3.0	2,696,377	2.696	4.172	7.55	NO	3.27	0.93	53%	1.2972	2.857	3.22
7	6	690	21	1382.45	1380.91	0.0022	0.013	1408.05	27.3	DU2-A, DU2-C	57,197	955,989	3.0	2,867,967	2.868	4.437	7.51	NO	3.35	0.97	55%	1.3651	2.935	3.25
6	5	677	21	1380.91	1380.02	0.0013	0.013	1403.67	24.5	DU2-B	28,166	984,155	3.0	2,952,466	2.952	4.568	5.76	NO	3.85	1.18	67%	1.7198	3.365	2.66
5	4	817	21	1380.02	1378.96	0.0013	0.013	1400.54	22.3	DU1-D	62,288	1,046,443	2.5	2,616,109	2.616	4.048	5.72	NO	3.63	1.09	62%	1.5689	3.176	2.58
4	3	567	21	1378.96	1377.67	0.0023	0.013	1399.99	22.8	---	---	1,046,443	2.5	2,616,109	2.616	4.048	7.58	NO	3.22	0.91	52%	1.2640	2.819	3.20
3	2	615	21	1377.67	1376.79	0.0014	0.013	1398.37	22.4	DU1-C	11,567	1,058,010	2.5	2,645,026	2.645	4.092	6.01	NO	3.57	1.06	61%	1.5228	3.120	2.69
2	1	564	21	1376.79	1375.67	0.0020	0.013	1392.75	17.7	DU1-A, DU1-B	11,416	1,069,426	2.5	2,673,565	2.674	4.137	7.08	NO	3.34	0.96	55%	1.3530	2.921	3.06

Notes:

** Offsite 5, which includes SB105, has been removed from this study. The Eastmark Master Sewer report (Prepared by Wood Patel & Assoc., Inc., dated 1/15/2014) was revised to capture Offsite 5, which is now sewered to the Ray Road sewerline.

(1) Highlighed Cell - The removal of Offsite 5 (SB105) reduces the size of the 'Node 9 - Node 10' length from 21 inches to 18 inches.

(2) Slopes and lengths updated to match DU2 Phase 1 Layout / Pre-Plat (Notes 1 to 10)

EXHIBIT 10

MASTER SEWER EXHIBIT

11-007 - PACIFIC PROVING GROUNDS NORTH

RAY ROAD

CONNECT TO PROPOSED MANHOLE WITH 21" LINE

#1 #2 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13 #14 #15 #16 #17 #18 #19 #20 #21

DU1-A DU1-B DU1-C DU1-D

DU2-A DU2-B DU2-C DU2-D DU2-E DU2-F DU2-G DU2-H DU2-I DU2-J DU2-K DU2-L DU2-M DU2-N DU2-O DU2-P

DU3-A

DU4-A DU4-B DU4-C DU4-D DU4-E

DU5-A

OFFSITE 5 – SB105 IS SEWERED TO THE RAY ROAD SEWER LINE AND IS NO LONGER CONTRIBUTING TO THIS STUDY AREA

Offsite 1
89.9 Ac. Gross
LI

Offsite 2
68.8 Ac. Gross
LI

Offsite 3
~~110.7~~ Ac. Gross
LI

Offsite 4
~~100.2~~ Ac. Gross
GI

Offsite 5
105.9 Ac. Gross
LDR

Offsite 6
53.0 Ac. Gross
LDR

Offsite 7
158.7 Ac. Gross
ER

Offsite 8
158.9 Ac. Gross
ER

WILLIAMS FIELD ROAD

ELLSWORTH ROAD

CRISMON ROAD

SIGNAL BUTTE ROAD

MOUNTAIN ROAD

PECOS ROAD

LEGEND

- PPGN DU1
- PPGN DU2
- PPGN DU3
- PPGN DU4
- PPGN DU5
- OFFSITE PARCELS
- JUNCTION NODE

PIPE SIZING

NODES	PIPE SIZE
1–9	21"
9–12	18"
12–18	15"
18–20	12"
20–21	10"

NORTH

SCALE: 1"=1400'

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PACIFIC PROVING GROUNDS NORTH
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MASTER SEWER EXHIBIT

Project:

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Designer: BAN
Drawn by: BAN

Sheet No. 1 of 1