SECTION 7.0

LANDSIDE DEMAND CAPACITY ANALYSIS/FACILITY REQUIREMENTS

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7.1 INTRODUCTION

The objective of the landside demand/capacity analysis is to determine the capability of existing airport landside facilities to accommodate existing and future aviation demands as quantified by the aviation forecasts developed in Section 5.0, Forecasts of Aviation Demand, of this report. Once the demand/capacity analysis is performed, facility requirements can be determined. This section will describe those additional facilities identified as being required to meet future aviation demands as well as identify a timeframe in which the new facilities need to be implemented. Other facilities recommended based on safety, operating efficiency, or to maintain, restore, and upgrade facilities to current standards will also be described.

7.2 GENERAL AVIATION FACILITY REQUIREMENTS

This section addresses general aviation facility requirements according to current and projected levels of local and itinerant general aviation activity. In some cases, existing capacity is higher than actual demand due to recently completed hangar development on the airport. It is assumed that once these facilities are operational, capacity will be reached.

7.2.1 Aircraft Storage

The demand for T-hangar, conventional (common storage) hangar, shade hangar, and apron parking space is projected to increase as the levels of based aircraft increase throughout the 20-year planning period. The combination of how these spaces will be built depends upon fleet mix, private or commercial use, and building space requirements. Table 7.1 shows the existing breakdown of hangared (T-hangar, conventional, and shade hangar) versus apron-parked based aircraft at Double Eagle II Airport. Aircraft transferred to Double Eagle II Airport from Coronado Airport are parked on the apron due to inadequate available hangar space. Therefore, existing and pre-Coronado Airport storage ratios are presented in Table 7.1.

It is anticipated that demand for aircraft storage space will remain similar, in terms of hangar space versus apron space, as that shown in Table 7.1. In the case of single-engine piston aircraft, it is anticipated that demand for hangar space versus apron space would reflect the pre-Coronado Airport closure ratio.

Table 7.2 shows the based aircraft forecast by type from Section 5.0, Forecasts of Aviation Demand. The table represents the high forecast scenario, consisting of up to 50 percent of Albuquerque International Sunport based aircraft moving to Double Eagle II Airport by 2015. Table 7.3 shows the storage demands assumed in Table 7.1 (single-engine piston pre-Coronado Airport ratios are used) applied to the forecasts in Table 7.2. It is assumed that “Other” aircraft (balloon, ultralight, glider, etc.) would be housed with another fixed-wing aircraft in a hangar; therefore, they are not accounted for. In addition, Eclipse Aviation turbojets are not included in Table 7.3 because it is assumed that they would be kept in the Eclipse Aviation facility, which is not included within this aircraft storage facility requirements analysis. The existing hangar and apron storage capacity level is shown in Figure 7.1 with the existing and forecast demand levels listed in Table 7.3. The chart shows that hangar storage demand has reached the existing

capacity (all hangar space is currently full). In addition, an initial increase in hangar capacity would result in relocation of existing apron-based aircraft (including recently migrated Coronado Airport aircraft) and a decline in apron demand through 2006.

TABLE 7.1
EXISTING BASED AIRCRAFT STORAGE BREAKDOWN
Double Eagle II Airport
Master Plan Study

Aircraft Group	Hangar*	Apron	Total
Single-Engine Piston (existing)	52%	48%	100%
Single-Engine Piston (pre-Coronado Airport Closure)	65%	35%	100%
Multi-Engine Piston	86%	14%	100%
Turboprop	100%	0%	100%
Jet	100%	0%	100%
Helicopter	100%	0%	100%

* Includes T-Hangars, conventional hangars, and shade hangars.
Source: URS Corporation, 2001.

TABLE 7.2
BASED AIRCRAFT FORECAST BY TYPE SUMMARY
Double Eagle II Airport
Master Plan Study

Year	Fixed Wing					Helicopter	Other	Total
	Piston		Turbine					
	Single-Engine	Multi-Engine	Turboprop	Eclipse Aviation Turbojet	Turbojet			
High Forecast Scenario								
2001	187	14	6	n/a	2	17	3	229
2006	198	15	6	12	3	20	3	257
2011	224	24	7	12	5	25	3	300
2016	301	61	7	12	15	31	3	430
2021	316	64	7	12	18	31	3	451

Sources: Double Eagle II Airport - URS Corporation, 2002.
Albuquerque International Sunport Draft Master Plan, Table II-X, Page II-35, 2000.

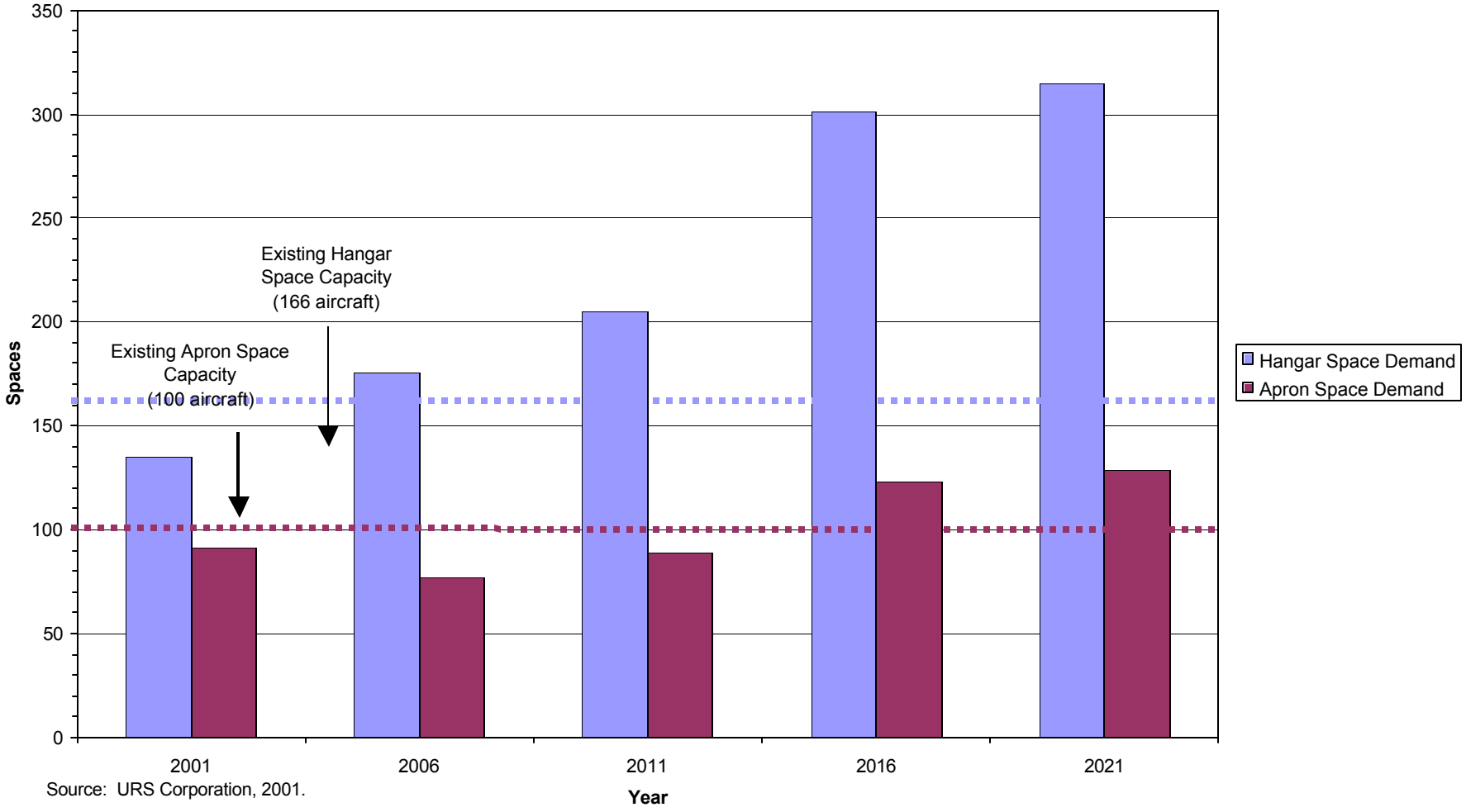
TABLE 7.3
BASED AIRCRAFT STORAGE DEMAND
Double Eagle II Airport
Master Plan Study

Year	Hangar	Apron	Total
High Forecast Scenario			
2001	135	91	226
2006	171	71	242
2011	204	81	285
2016	301	114	415
2021	316	120	436

Notes: Eclipse Aviation Turbojet aircraft are not included in the storage demand forecasts.
"Other" aircraft types are assumed to share hangar space with fixed-wing or helicopter aircraft.

Source: URS Corporation, 2002.

FIGURE 7.1
ESTIMATED BASED HANGAR AND APRON SPACE DEMAND
Double Eagle II Airport
Master Plan Study



Source: URS Corporation, 2001.

7.2.1.1 T-Hangar Space

Presently, Bode Aviation has 96 T-Hangars comprised of 112,320 square feet with individual hangar units of greater than 1,100 square feet. West Mesa Aviation has recently constructed two T-hangar buildings: one being 24 units/30,250 square feet and the other 15 units/25,652 square feet.

With the exception of the newly constructed T-hangars, all T-hangars are currently occupied. Based on the assumed distribution of based aircraft throughout the 20-year planning period, existing demand for all hangar space is expected to reach capacity once the new T-hangars are operational. Additional T-hangars are currently needed to accommodate increased demand generated by the closure of Coronado Airport. As seen in Figure 7.1, the demand for hangar space will be approximately 171 spaces by 2006 and 316 spaces by 2021. Although this accounts for all hangar types, the T-hangars are assumed to account for the majority of this demand due to their cost and storage flexibility (ability to accommodate turbojet, turboprop, single-engine piston, etc.).

7.2.1.2 Conventional Hangar Space

Presently, there is a total of 44,920 square feet of conventional hangar space and it is comprised of five buildings. Based on the assumed distribution of based aircraft throughout the 20-year planning period and a planning factor of 1,800 square feet per aircraft, projected demand for hangar space has exceeded current capacity.

The conventional hangar space market is assumed to remain a small percentage of the overall storage capacity at Double Eagle II Airport. However, an increase in high performance turbojet aircraft activity at the airport will increase demand for conventional hangar space. The demand for conventional hangar space by higher performance aircraft is associated with the implementation of an airport traffic control tower, availability of adequate runway length, and other off-airport development that would attract corporate aircraft (such as a hotel(s), a business center, rental car facility, etc.).

7.2.1.3 Shade Hangar Space

Currently, six single-engine aircraft are housed in shade hangars. For planning purposes, no increase in demand for shade hangars will be assumed. The demand for hangar space will be accommodated with T-hangars and conventional hangar space.

7.2.1.4 Based Aircraft Apron Area

As shown in Figure 7.1, the based aircraft apron storage capacity will reach saturation between 2011 and 2016. Demand for storage space increased after the closure of Coronado Airport, when 39 aircraft moved to Double Eagle II Airport. There are approximately 100 spaces available for based aircraft tie-down; 91 aircraft are currently stored on the apron. Due to the lack of adequate hangar space, all relocated Coronado Airport aircraft are currently parked on the apron. However, it is assumed that these aircraft would be stored in hangars if space were available.

7.2.1.5 Transient Aircraft Apron Area

The transient aircraft parking spaces total approximately ten between both FBOs. Based on forecasts of increasing transient or itinerant aircraft operations (average annual increase of 3.8 percent), transient

aircraft parking space will need to be expanded. As shown in Table 7.4, it is estimated that demand for transient parking spaces would be between 40 and 60 spaces by 2021. The increase in transient aircraft is based upon the implementation of the airport traffic control tower, airfield development, and off-airport development.

TABLE 7.4
ESTIMATED TRANSIENT AIRCRAFT PARKING POSITIONS
Double Eagle II Airport
Master Plan Study

Aircraft Type	Current	2011	2021
Single-Engine Piston	10	10-15	18-25
Twin-Engine Piston	N/A	5-10	8-15
Turboprop	N/A	3-5	4-7
Small Jet	N/A	6-8	8-10
Large Jet	N/A	1-2	2-3
Total		**25-40**	**40-60**

Source: URS Corporation, 2002.

7.2.2 Apron Pavement Strength

The pavement strength of all existing apron areas is 30,000 pounds single-gear and 45,000 pounds dual gear. This is identical to the current taxiway and runway systems at Double Eagle II Airport, and adequate for future requirements of the airport. However, if a greater percentage of larger business jet aircraft use the airport in the future, sections of the transient apron should be strengthened.

7.2.3 Aircraft Fuel Storage

The airport's existing fuel storage tanks, operated by the FBOs, consist of one 20,000-gallon Jet A storage tank and three 20,000-gallon Avgas storage tanks. Bode Aviation operates one Jet A storage tank (20,000 gallons) and one Avgas tank (20,000 gallons). West Mesa operates one Jet A storage tank (20,000 gallons) and one Avgas storage tank (20,000 gallons). However, the West Mesa Jet A fuel storage tank was not in use at the time of this study. In addition, the FBOs operate four fuel trucks with capacity of 7,250 gallons.

Existing demand for fuel at the airport was determined by analyzing fuel sales records in 2001 (January 1 through September 9). The number of days of fuel in reserve was used to determine if the storage capacity is adequate for the existing demand and forecast demand. The number of days of fuel in reserve (assuming the full capacity of storage is utilized) is determined by dividing the fuel storage capacity by the average daily fuel flow. Analysis revealed that Bode Aviation has approximately 56 days in reserve of Avgas (358 gallons per day (gpd); 20,000 gallons of storage) and approximately 32 days in reserve of Jet A fuel (619 gpd; 20,000 gallons of storage). West Mesa has approximately 78 days of fuel in reserve of Avgas (257 gpd; 20,000 gallons of storage). These figures are all above the industry average for number of days of fuel in reserve (seven to fourteen days). Therefore, the Double Eagle II Airport fuel storage capacity meets the existing demand.

Utilizing the highest level of forecast demand in 2021 (high forecast scenario), it was determined that Bode Aviation would have approximately 18 days in reserve of Avgas (estimated 1,140 gpd; 20,000 gallons of storage) and approximately 10 days in reserve of Jet A fuel (estimated 1,970 gpd; 20,000 gallons of storage). West Mesa would have approximately 25 days in reserve of Avgas (estimated 820 gpd; 20,000 gallons of storage). These estimates are based on existing market share and existing utilized storage facilities. The utilization of the West Mesa Jet A fuel storage tank would increase the total number of Jet A fuel days in reserve to 21 days. All of the number of days of fuel in reserve is at or above the industry average.

The total capacity of fuel storage systems at Double Eagle II Airport is adequate for the near and immediate future (5 to 10 years). The capacity of Double Eagle II Airport fuel storage should be re-examined in the future as activity levels and FBO market shares change.

7.2.4 Auto Parking

The auto parking area is located between the two existing FBOs and provides spaces for 81 automobiles. As the based aircraft and operational levels increase at the airport, additional automobile parking spaces will be required. The development of additional automobile parking spaces should coincide with possible general aviation terminal and/or FBO expansion development.

7.3 SUPPORT FACILITY REQUIREMENTS

The support facilities at Double Eagle II Airport include Aircraft Rescue and Firefighting Facilities (ARFF), Airport Maintenance Facilities, and Airport Administration Offices. These facilities are important to enhance the safety and efficiency of the airport.

7.3.1 Aircraft Rescue and Firefighting Facilities

Currently, Double Eagle II Airport does not have Aircraft Rescue and Firefighting Facilities located on the airfield. The airport is currently served by the City of Albuquerque Fire Department from stations in Paradise Hills and at Central and 98th Avenues. As operational levels at the airport increase, ARFF should be planned at Double Eagle II Airport in the future to enhance the operational safety of the airport. The Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5210-15, *Aircraft Rescue and Firefighting Station Building Design*, should be used to plan and design a possible on-site ARFF.

Since Double Eagle II Airport is not a Part 139-certificated air carrier airport, minimum requirements detailed (by Index) in §139.317 do not have to be met. However, FAA AC 150/5210-6C, *Aircraft Fire and Rescue Facilities and Extinguishing Agents*, provides guidance for general aviation airport fire protection. Double Eagle II Airport, with its existing operational level and fleet mix, is classified as an Index 1 general aviation airport (airports having at least 1,825 annual departures of aircraft more than 30 feet but not more than 45 feet long). By 2021, all forecast scenarios would elevate Double Eagle II Airport to an Index 2 general aviation airport classification (airports having at least 1,825 annual departures of aircraft more than 45 feet but not more than 60 feet long). One firefighting vehicle is recommended for both classifications, however, the recommended levels of primary and supplemental agents (firefighting materials) increase as shown in Paragraph 17, Table 4, of FAA AC 150/5210-6C and Table 7.5.

TABLE 7.5
SCALES OF FIRE PROTECTION FOR GENERAL AVIATION AIRCRAFT
Double Eagle II Airport
Master Plan Study

Index	Primary Agents				Supplementary Agent	Number of Vehicles
	AFFF or Protein Foam					
	Water for Foam Production (gal)	Solution Application Rate (gpm)	Water for Foam Production (gal)	Solution Application Rate (gpm)	Dry Chemical Powders (Pounds)	
	(Q)	(Q_1)	(Q)	(Q_1)		
1[1]	190	150	290	230	300	1
2	310	230	490	350	400	1

[1] Rounded off to the nearest 10 gallons. For practical application, the quantities in Columns 2 and 4 should be adjusted to coincide with conventional water tanks of 200-, 300-, and 500-gallon capacities.

Note: AFFF = Aqueous Film Forming Foam.
Source: FAA AC 150/5210-6C.

7.3.2 Airport Maintenance Facilities

Currently, the Double Eagle II Airport Maintenance and Airport Administration Offices are collocated. The Airport Maintenance Office consists of 1,700 square feet. The Airport Maintenance Facility also occupies an outdoor, fenced-in area approximately 100 feet x 70 feet for field equipment storage.

The Airport Maintenance Office could require up to 0.5-acre of space in the future. Possible future development of the "midfield" area (for aviation-related uses) could require relocation of the existing maintenance facilities. Demand for equipment storage space should be re-examined at that time to ensure adequate storage and working space capacity.

7.3.3 Airport Administration Office

Currently, the Double Eagle II Airport Maintenance and Airport Administration offices are collocated. The Airport Administration Office consists of 400 square feet. Dedicated Airport Administration Office space is currently required and should be planned to accommodate possible additional Double Eagle II Airport staff. The Airport Administration Facility could require up to 0.5-acre of space in the future.

7.4 AIRPORT ACCESS

7.4.1 Off-Airport Ground Access

In review of the City's comprehensive transportation planning efforts, the proposed west side transportation corridors will provide and met any surface airport access requirements to the Double Eagle II Airport site.

7.4.2 On-Airport Ground Access

On-site internal ground access roads will be expanded in conjunction with future general aviation facility development. On-site future right-of-way corridors should be reserved and identified on planning documents. Some sections of on-site roads adjacent to activity centers may become four-lane divided roads with greenbelt-landscaped features.

7.5 INFRASTRUCTURE REQUIREMENTS

The utility infrastructure facilities at or near Double Eagle II Airport include water, sewer, electrical, and natural gas facilities. Projected near-term infrastructure demands at Double Eagle II Airport are driven by the planned development of the Eclipse Aviation manufacturing facility. Near-term growth is also expected to occur in the general aviation activities at Double Eagle II Airport and will contribute to the utility demands in the future.

7.5.1 Water System

The existing water well at Double Eagle II Airport is capable of producing up to an estimated 200 gallons per minute (gpm). The well currently is equipped for a pumping capacity of approximately 120 gpm. Currently, the well is used only for fire protection due to the arsenic levels found in the water. Bottled water is used for drinking and potable purposes.

The water distribution system is split between a domestic use distribution system and a separate fire protection system. Both systems are pressurized by pumps located adjacent to storage reservoirs north of the FBO area. The well pump feeds the reservoirs, a 15,000-gallon, and a 500,000-gallon reservoir. A small chlorine disinfection system is connected to the domestic water supply system.

The initial increase in water demand at Double Eagle II Airport due to Eclipse Aviation is projected to average approximately 173,400 gpd with a peak hour demand of 104 gpm. This includes estimations for domestic demand, food service demand, flight operations, and landscape irrigation, and the adjacent Soils Amendment Facility. This increase will occur with the initial development of the Eclipse Aviation facilities that are estimated to employ approximately 2,000 people.

A project is currently in the design phase that will construct water system improvements at Double Eagle II Airport capable of meeting a 200-gpm (286,300-gpd) peak demand. This new capacity will be capable of meeting the projected near-term demand (through 2008).

Ultimate development at Double Eagle II Airport will generate a total water demand of approximately 500,100 gpd with a peak hour demand of 313 gpm. This includes projections for additional development at the airport as well as development associated with Eclipse Aviation.

Fire protection, as specified in the 1997 Uniform Fire Code, is estimated for the water storage required to fight one fire event for the largest building located at the facilities. The storage requirement also depends on the type of building construction. The largest building is estimated at approximately 60,000 square feet (Eclipse Aviation) requiring fire storage of approximately 1.26 million gallons.

7.5.2 Sanitary Sewer Collection and Treatment

The existing sanitary sewer collection system at Double Eagle II Airport consists of 8-inch gravity sewer line collecting wastewater from the FBO area feeding a disposal system consisting of a septic tank, a septic tank effluent lift station and drain field. The septic tank has a capacity of 12,500 gallons. The drain field consists of 12 distribution boxes with two leach lines extending out 100 feet in opposite directions from the boxes. The overall dimension of the drain field is 200 feet wide by 110 feet long. The current system has an estimated capacity of 15,200 gpd.

The estimated water demands developed by estimating the requirements of the Eclipse Aviation manufacturing facilities as well as growth in the FBO area of Double Eagle II Airport were used as the basis for formulating the estimate wastewater flows at Double Eagle II Airport. Impacts of the new arsenic rule on wastewater flows and treatment have not been included in the estimated demands.

The initial development associated with Eclipse Aviation is projected to generate an average wastewater flow of 150,700 gpd with a peak wastewater flow of 300,000 gpd. This projection includes contributions from manufacturing and other industrial facilities, domestic needs, food service, flight operations, and the Soils Amendment Facility.

A project is currently in the design phase that will construct sewer system improvements at Double Eagle II Airport capable of meeting a 195,700-gpd average demand and a peak demand of 525,000 gpd. This new capacity will be capable of meeting the projected near-term demand (through 2008).

The ultimate development of the Double Eagle II Airport site is estimated to generate an average wastewater flow of approximately 435,900 gpd with a peak wastewater flow of 866,000 gpd.

7.5.3 Electrical Power

The existing power supply system at Double Eagle II Airport consists of overhead electrical distribution lines that feed a current demand of less than 0.5 megawatt (mW).

The initial development associated with Eclipse Aviation is projected to create a demand of 3.5 mW that is expected to be met by existing system capacity at or near Double Eagle II Airport.

The ultimate development of the Double Eagle II Airport site is estimated create a demand of 10 mW, which may require construction of a new power substation. PNM is aware of the planned growth and has begun programming future capacity improvements.

7.5.4 Natural Gas

There is currently no natural gas service at Double Eagle II Airport, and thus no current demand exists.

There is a high-pressure natural gas line running NE-SE through the northwest section of the airport property. The high-pressure line could be tapped and a regulator station installed, which would allow natural gas service to Double Eagle II Airport in the future.