AIRPORT MASTER PLAN

Final Report

CANYONLANDS FIELD

MOAB, UTAH | OCTOBER 2015

ARMSTRONG

TABLE OF CONTENTS

CHAPTER ONE - INTRODUCTION

1.1 INTRODUCTION 1-1
1.2 PURPOSE 1-1
1.3 OBJECTIVES 1-2
1.4 AIRPORT MASTER PLAN PROCESS AND SCHEDULE 1-3
1.5 TECHNICAL ADVISORY COMMITTEE 1-4

CHAPTER TWO - AIRPORT INVENTORY

2.1 AIRPORT HISTORY AND INTRODUCTION 2-1
2.2 AIRPORT MANAGEMENT AND OWNERSHIP STRUCTURE 2-3
2.3 AIRPORT LOCATION 2-3
2.4 AIRPORT GRANT HISTORY 2-4
2.5 AIRPORT CLASSIFICATION 2-5
2.5.1 NPIAS SERVICE LEVEL 2-5
2.5.2 UTAH CONTINUOUS AIRPORT SYSTEM PLAN 2-6
2.6 AIRPORT ROLE 2-7
2.7 REGIONAL SETTING, TOPOGRAPHY AND TERRAIN 2-8
2.8 SOCIOECONOMIC FACTORS 2-9
2.8.1 LOCAL PROFILE 2-9
2.8.2 POPULATION 2-9
2.8.3 EMPLOYMENT 2-10
2.8.4 INCOME 2-11
2.8.5 ADDITIONAL GROWTH INDICATORS 2-12
2.9 CERTIFICATED AIRMEN AND REGISTERED AIRCRAFT 2-12
2.10 BASED AIRCRAFT AND OPERATIONS 2-12
2.11 PASSENGER ENPLANEMENTS 2-13
2.12 AIRPORT SERVICE AREA 2-14
2.12.1 AIRLINE PASSENGER SERVICE AREA 2-14
2.12.2 GENERAL AVIATION SERVICE AREA 2-16
2.13 EXISTING AIRSIDE FACILITIES 2-18
2.13.1 RUNWAY 3-21 2-19
2.13.2 TAXIWAY SYSTEM 2-19
2.13.3 AIRCRAFT APRON AREA AND HELIPORT 2-20
2.13.4 AIRFIELD LIGHTING, SIGNAGE AND VISUAL AIDS 2-21
2.13.5 NAVIGATIONAL AIDS AND INSTRUMENT APPROACHES 2-25
2.13.6 FEDERAL AVIATION ADMINISTRATION SAFETY AND DESIGN STANDARDS 2-28
2.13.6.1 AIRPORT DESIGN STANDARDS 2-28
2.13.6.2 SAFETY AREAS 2-29
2.13.6.3 OBSTACLE FREE ZONE AND OBJECT FREE AREA 2-30
2.13.6.4 RUNWAY PROTECTION ZONE (RPZ) 2-30
2.13.7 TITLE 14 CODE OF FEDERAL REGULATIONS (CFR) PART 77 2-31
2.14 EXISTING LANDSIDE FACILITIES 2-34
2.14.1 PASSENGER TERMINAL BUILDING 2-35
2.14.2 AIRLINE TICKET COUNTERS AND OFFICES 2-37
2.14.3 SECURITY SCREENING AREA 2-37
2.14.4 PASSENGER BOARDING GATE 2-37
2.14.5 GREETER'S LOBBY 2-37

2.14.6 RENTAL CAR SERVICES 2-38
2.14.7 CURB SIDE 2-38
2.14.8 MISCELLANEOUS SERVICES AND FACILITIES 2-38
2.14.9 AIRPORT SERVICES/FIXED BASE OPERATORS 2-38
2.14.10 AIRPORT MAINTENANCE AND EQUIPMENT 2-39
2.14.11 HANGARS 2-39
2.14.12 UTILITIES 2-40
2.14.13 ACCESS ROUTES, SIGNAGE AND AUTOMOBILE PARKING 2-40
2.14.14 INTERMODAL TRANSPORTATION 2-40
2.14.15 AIRCRAFT FUEL FACILITIES 2-41
2.14.16 SECURITY 2-41
2.14.17 EMERGENCY SERVICES 2-41
2.14.18 WEATHER REPORTING SERVICES 2-43
2.14.19 SUMMARY OF AIRPORT FACILITIES 2-44
2.15 AIRSPACE 2-45
2.15.1 NATIONAL AIRSPACE SYSTEM 2-45
2.15.2 AIRSPACE JURISDICTION 2-47
2.15.3 AIRSPACE RESTRICTIONS 2-47
2.16 CLIMATE AND METEOROLOGICAL CONDITIONS 2-47
2.16.1 LOCAL CLIMATOLOGICAL DATA 2-48
2.16.2 CEILING AND VISIBILITY CONDITIONS 2-48
2.16.3 WIND CONDITIONS 2-48
2.17 ENVIRONMENTAL INVENTORY 2-50
2.17.1 AIR QUALITY 2-51
2.17.2 COMPATIBLE LAND USE PLANNING 2-51
2.17.3 DEPARTMENT OF TRANSPORTATION ACT - SECTION 4 (F) 2-52
2.17.4 PRIME AND UNIQUE FARMLANDS 2-52
2.17.5 FLOODPLAINS 2-53
2.17.6 FISH, WILDLIFE AND PLANTS 2-53
2.17.7 WETLANDS 2-54
2.17.8 NOISE 2-55

CHAPTER THREE - FORECASTS OF AVIATION DEMAND

3.1 INTRODUCTION 3-1
3.2 NATIONAL AND REGIONAL TRENDS 3-2
3.2.1 REGIONAL CARRIERS 3-2
3.2.2 CARGO 3-2
3.2.3 GENERAL AVIATION 3-2
3.2.4 AVIATION INDUSTRY TRENDS 3-3
3.3 EXISTING BASELINE ACTIVITY LEVELS 3-3
3.4 AVAILABLE ACTIVITY FORECASTS 3-4
3.5 FORECASTS OF AVIATION ACTIVITY 3-4
3.5.1 FACTORS INFLUENCING AVIATION DEMAND AT CANYONLANDS FIELD 3-4
3.5.2 ENPLANEMENT FORECAST 3-6
3.5.3 BASED AIRCRAFT FORECAST 3-10
3.5.4 AIRCRAFT OPERATIONS FORECAST 3-12
3.5.5 ITINERANT AND LOCAL OPERATIONS 3-13
3.6 AIRPORT SEASONAL USE DETERMINATION 3-15
3.7 HOURLY DEMAND AND PEAKING TENDENCIES 3-15
3.8 FORECAST SUMMARY 3-18

CHAPTER FOUR - FACILITY REQUIREMENTS

4.1 INTRODUCTION 4-1
4.2 DESIGN STANDARDS 4-1
4.3 AIRFIELD CAPACITY 4-6
4.4 AIRSIDE FACILITY REQUIREMENTS 4-6
4.4.1 RUNWAY REQUIREMENTS 4-6
4.4.2 CROSSWIND COVERAGE 4-10
4.4.3 TAXIWAY REQUIREMENTS 4-11
4.4.4 AIRCRAFT APRON 4-12
4.4.5 NAVIGATIONAL AIDS 4-14
4.4.6 INSTRUMENT APPROACH PROCEDURES 4-14
4.4.7 AIRFIELD LIGHTING, SIGNAGE, MARKING AND VISUAL AIDS 4-14
4.5 LANDSIDE FACILITY REQUIREMENTS 4-15
4.5.1 TERMINAL BUILDING 4-15
4.5.1.1 MINIMUM FACILITY SIZE 4-15
4.5.1.2 BAGGAGE CLAIM 4-16
4.5.1.3 AIRLINE TICKET COUNTER 4-16
4.5.1.4 BAGGAGE SECURITY SCREENING AND PROCESSING 4-17
4.5.1.5 TSA PASSENGER SCREENING CHECKPOINT 4-18
4.5.1.6 PASSENGER BOARDING GATE AND AIRCRAFT PARKING POSITIONS 4-18
4.5.1.7 RESTROOMS 4-19
4.5.1.8 RESTAURANT AND CONCESSIONS 4-19
4.5.1.9 CIRCULATION 4-19
4.5.2 TERMINAL BUILDING SQUARE FOOTAGE ANALYSIS 4-19
4.5.3 TERMINAL BUILDING ENVIRONMENTAL CONSIDERATIONS 4-20
4.5.4 HANGAR FACILITIES 4-21
4.5.5 AVIATION FUEL FACILITIES 4-21
4.5.6 UTILITIES 4-21
4.5.7 AIRPORT ACCESS AND VEHICLE PARKING 4-22
4.5.8 FENCING 4-22
4.5.9 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) STATION AND EQUIPMENT 4-22
4.5.10 AIRPORT MAINTENANCE EQUIPMENT AND STORAGE 4-23
4.5.11 NON-AERONAUTICAL REVENUE GENERATION 4-23
4.5.12 WEATHER REPORTING SERVICES 4-24
4.6 LAND USE COMPATIBILITY AND CONTROL 4-24
4.6.1 AIRPORT PROPERTY 4-24
4.6.2 COMPATIBILITY WITH STATE/REGIONAL PLANS 4-24
4.6.3 ZONING AND LAND USE 4-24
4.7 PART 77 AIRSPACE SURFACES 4-25
4.7.1 PRIMARY SURFACE 4-26
4.7.2 APPROACH SURFACE 4-26
4.7.3 TRANSITIONAL SURFACE 4-26
4.7.4 HORIZONTAL SURFACE 4-26
4.7.5 CONICAL SURFACE 4-26
4.8 SUMMARY OF FACILITY REQUIREMENTS AND FAA DESIGN STANDARDS 4-28

CHAPTER FIVE - DEVELOPMENT ALTERNATIVES

5.1 INTRODUCTION 5-1
5.2 DEVELOPMENT OBJECTIVES 5-1

5.3 AIRSIDE DEVELOPMENT ALTERNATIVES 5-2
5.3.1 C-II ARC UPGRADE (SHORT-TERM) 5-2
5.3.2 C-III ARC UPGRADE (MEDIUM TO LONG-TERM) 5-6
5.3.3 CROSSWIND RUNWAY 5-7
5.3.4 AIRCRAFT PARKING APRON 5-9
5.4 LANDSIDE FACILITY REQUIREMENTS 5-9
5.4.1 PASSENGER TERMINAL BUILDING 5-9
5.4.2 HANGAR FACILITIES 5-9
5.4.3 AIRPORT ACCESS AND AUTOMOBILE PARKING 5-10
5.4.4 PERIMETER WILDLIFE FENCE 5-10
5.6 RECOMMENDATIONS AND CONCLUSION 5-10

CHAPTER SIX – AIRPORT LAYOUT PLAN

CHAPTER SEVEN – ENVIRONMENTAL OVERVIEW

7.1 INTRODUCTON 7-1
7.2 ENVIRONMENTAL OVERVIEW 7-2
7.2.1 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS 7-6

CHAPTER EIGHT – AIRPORT DEVELOPMENT AND FINANCIAL PLAN

8.1 INTRODUCTION 8-1
8.3 CAPITAL DEVELOPMENT 8-1
8.2.1 FEDERAL AVIATION ADMINISTRATION 8-1
8.2.2 STATE OF UTAH 8-2
8.2.3 CANYONLANDS FIELD 8-3
8.3 AIRPORT DEVELOPMENT PLAN 8-5
8.4 FINANCIAL PLAN 8-7
8.4.1 PROJECTED REVENUES AND EXPENDITURE 8-8
8.5 RECOMMENDATIONS 8-12
8.5.1 COMMUNITY SUPPORT 8-12
8.6 CONTINUOUS PLANNING PROCESS 8-13
8.7 SUMMARY 8-13

APPENDIX A – FAA FORECAST COMPARISON AND APPROVAL
APPENDIX B – SKYWEST AIRLINES LETTER OF SUPPORT
APPENDIX C – FAA RPZ ANALYSIS MEMO
APPENDIX D – ENVIRONMENTAL OVERVIEW SUPPORTING DOCUMENTATION
APPENDIX E – PUBLIC INVOLVEMENT
APPENDIX F – ACRONYMS
APPENDIX G – GLOSSARY OF TERMS

TABLES

TABLE 2-1 RECENT AIR CARRIER SERVICE AT CANYONLANDS FIELD 2-2
TABLE 2-2 AIRPORT GRANT HISTORY 2-4
TABLE 2-3 NPIAS AIRPORT CLASSIFICATION CRITERIA 2-6
TABLE 2-4 UTAH AIRPORTS BY CLASSIFICATION 2-7
TABLE 2-5 HISTORICAL AND FORECASTED POPULATION 2-10
TABLE 2-6 GRAND COUNTY EMPLOYMENT DISTRIBUTION 2-11

TABLE 2-7 PER CAPITA PERSONAL INCOME (PCPI) GROWTH 2-11
TABLE 2-8 BASED AIRCRAFT AND OPERATIONS IN 2013 2-12
TABLE 2-9 HISTORICAL ENPLANEMENT DATA 2-13
TABLE 2-10 MOAB AND NEARBY AIRPORTS WITH INSTRUMENT APPROACHES 2-17
TABLE 2-11 EXISTING APRON DATA 2-20
TABLE 2-12 AIRCRAFT APPROACH CATEGORY (AAC) 2-28
TABLE 2-13 AIRCRAFT DESIGN GROUP (ADG) 2-29
TABLE 2-14 VISIBILITY MINIMUMS 2-29
TABLE 2-15 CURRENT AIRFIELD DESIGN STANDARDS 2-31
TABLE 2-16 PART 77 SURFACES - RUNWAY 3-21 2-32
TABLE 2-17 CANYONLANDS FIELD RESCUE DATA 2-43
TABLE 2-18 EXISTING AIRPORT FACILITIES SUMMARY 2-44
TABLE 2-19 CROSSWIND COMPONENTS 2-49
TABLE 2-20 CANYONLANDS FIELD WIND DATA 2-49
TABLE 2-21 THREATENED AND ENDANGERED SPECIES, GRAND COUNTY, UTAH 2-54
TABLE 3-1 LOCAL INCOME METHOD 3-6
TABLE 3-2 NATIONAL PARK VISITOR METHOD 3-7
TABLE 3-3 FAA REGIONAL AIRLINE FORECAST METHOD 3-7
TABLE 3-4 ENPLANEMENT FORECAST METHODS 3-7
TABLE 3-5 AIR SERVICE SCENARIOS 3-9
TABLE 3-6 PER CAPITA METHOD 3-10
TABLE 3-7 MARKET SHARE METHOD 3-11
TABLE 3-8 BASED AIRCRAFT FORECAST METHODS 3-11
TABLE 3-9 FORECASTED BASED AIRCRAFT FLEET MIX 3-12
TABLE 3-10 FORECASTED ANNUAL OPERATIONS 3-13
TABLE 3-11 ESTIMATED MONTHLY/DAILY/HOURLY DEMAND - OPERATIONS 3-17
TABLE 3-12 ESTIMATED MONTHLY/DAILY/HOURLY DEMAND - PASSENGER ENPLANEMENTS 3-17
TABLE 3-13 FORECAST SUMMARY 3-18
TABLE 4-1 RUNWAY DESIGN CODE 4-2
TABLE 4-2 EXAMPLE AIRCRAFT HAVING A RDC OF A-I OR B-I 4-3
TABLE 4-3 EXAMPLE AIRCRAFT HAVING A RDC OF A-II OR B-II 4-3
TABLE 4-4 EXAMPLE AIRCRAFT HAVING A RDC OF C-II OR D-II 4-4
TABLE 4-5 EXAMPLE AIRCRAFT HAVING A RDC OF C-III OR D-III 4-4
TABLE 4-6 ANNUAL SERVICE VOLUME SUMMARY 4-6
TABLE 4-7 AIRPLANE WEIGHT CATEGORIZATION FOR RUNWAY LENGTH REQUIREMENTS 4-7
TABLE 4-8 RECOMMENDED RUNWAY LENGTHS 4-8
TABLE 4-9 EXISTING AND RECOMMENDED RUNWAY TO TAXIWAY CENTERLINE SEPARATIONS 4-11
TABLE 4-10 EXISTING AND RECOMMENDED TAXIWAY WIDTHS 4-12
TABLE 4-11 GENERAL AVIATION APRON AND HELICOPTER PARKING PAD REQUIREMENTS 4-13
TABLE 4-12 COMMERCIAL SERVICE APRON REQUIREMENTS 4-14
TABLE 4-13 PASSENGER TERMINAL BUILDING CAPACITY ANALYSIS 4-20
TABLE 4-14 ARFF REQUIREMENTS 4-23
TABLE 4-15 EXISTING AND FUTURE PART 77 SURFACES - RUNWAY 3-21 4-27
TABLE 4-16 SUMMARY OF AIRPORT FACILITY REQUIREMENTS 4-28
TABLE 4-17 EXISTING AND FUTURE AIRFIELD DESIGN STANDARDS 4-29
TABLE 5-1 C-II ARC UPGRADE ALTERNATIVES 5-2
TABLE 5-2 C-III ARC UPGRADE REQUIRED ACTION 5-6
TABLE 5-3 C-II AND C-III ARC UPGRADE COST ESTIMATES 5-7
TABLE 5-4 CROSSWIND RUNWAY ALTERNATIVES 5-7
TABLE 5-5 CROSSWIND RUNWAY COST ESTIMATES 5-9
TABLE 7-1 ENVIRONMENTAL OVERVIEW FOR CANYONLANDS FIELD 7-2

TABLE 8-1 20 YEAR FINANCIAL DEVELOPMENT PLAN (WITH EDC DESIGNATION) 8-6
TABLE 8-2 20 YEAR FINANCIAL DEVELOPMENT PLAN (WITHOUT EDC DESIGNATION) 8-7
TABLE 8-3 POTENTIAL PFC REVENUE (EXISTING PFC CAP)..... 8-9
TABLE 8-4 POTENTIAL PFC REVENUE (INCREASED PFC CAP) 8-10
TABLE 8-5 HISTORICAL AIRPORT REVENUES AND EXPENDITURES..... 8-11
TABLE 8-6 PROJECTED AIRPORT REVENUES AND EXPENDITURES..... 8-11

FIGURES

FIGURE 1-1 CANYONLANDS FIELD..... 1-1
FIGURE 1-2 AIRPORT MASTER PLANNING PROCESS..... 1-3
FIGURE 2-1 CANYONLANDS FIELD..... 2-1
FIGURE 2-2 LOCATION MAP..... 2-3
FIGURE 2-3 ARCHES NATIONAL PARK 2-8
FIGURE 2-4 TOPOGRAPHICAL MAP..... 2-9
FIGURE 2-5 HISTORICAL AND FORECASTED POPULATION 2-10
FIGURE 2-6 AIRLINE SERVICE MAP 2-13
FIGURE 2-7 HISTORICAL ENPLANEMENTS..... 2-14
FIGURE 2-8 SKYWEST AIRLINES EMB-120 2-15
FIGURE 2-9 REDTAIL AVIATION QUEST KODIAK..... 2-15
FIGURE 2-10 AIRLINE PASSENGER SERVICE AREA..... 2-16
FIGURE 2-11 GENERAL AVIATION SERVICE AREA..... 2-17
FIGURE 2-12 EXISTING AIRSIDE FACILITIES 2-18
FIGURE 2-13 RUNWAY 3-21 AND TAXIWAYS 2-19
FIGURE 2-14 AIRCRAFT PARKING APRON 2-21
FIGURE 2-15 RUNWAY EDGE LIGHTS 2-22
FIGURE 2-16 THRESHOLD LIGHTS..... 2-22
FIGURE 2-17 PAVEMENT MARKINGS 2-23
FIGURE 2-18 TAXIWAY SIGNAGE..... 2-24
FIGURE 2-19 RNAV (GPS) RUNWAY 3 APPROACH..... 2-26
FIGURE 2-20 VOR-A CIRCLING APPROACH..... 2-27
FIGURE 2-21 14 CFR PART 77 SURFACES..... 2-33
FIGURE 2-22 EXISTING LANDSIDE FACILITIES 2-34
FIGURE 2-23 PASSENGER TERMINAL BUILDING 2-35
FIGURE 2-24 PASSENGER TERMINAL BUILDING FLOOR PLAN..... 2-36
FIGURE 2-25 SKYWEST AIRLINES TICKET COUNTER 2-37
FIGURE 2-26 TERMINAL BUILDING LOBBY 2-37
FIGURE 2-27 RENTAL CAR DESK 2-38
FIGURE 2-28 FORD TAURUS SEDAN..... 2-39
FIGURE 2-29 HANGARS AT CANYONLANDS FIELD..... 2-39
FIGURE 2-30 PASSENGER TERMINAL BUILDING PARKING 2-40
FIGURE 2-31 ARFF STATION..... 2-42
FIGURE 2-32 ARFF TRUCK WITH ARFF PERSONNEL 2-43
FIGURE 2-33 AIRSPACE CLASSIFICATIONS..... 2-46
FIGURE 2-34 SECTIONAL MAP 2-46
FIGURE 2-35 PRECIPITATION MAP 2-48
FIGURE 2-36 CANYONLANDS FIELD WINDROSE - ALL WEATHER 2-49
FIGURE 2-37 CANYONLANDS FIELD WINDROSE - IFR CONDITIONS..... 2-50
FIGURE 2-38 NON-ATTAINMENT MAP 2-51
FIGURE 2-39 WETLANDS MAP 2-54
FIGURE 2-40 EXISTING NOISE CONTOUR..... 2-56

FIGURE 3-1 NEXTGEN TECHNOLOGY 3-3
FIGURE 3-2 NEXTGEN PRECISION 3-3
FIGURE 3-3 REDTAIL AVIATION QUEST KODIAK 3-4
FIGURE 3-4 SKYWEST AIRLINES EMB-120 3-5
FIGURE 3-5 BOMBARDIER CRJ-700 3-5
FIGURE 3-6 FORECASTED PASSENGER ENPLANEMENTS 3-8
FIGURE 3-7 FORECASTED ENPLANEMENTS SCENARIOS 3-10
FIGURE 3-8 FORECASTED BASED AIRCRAFT 3-11
FIGURE 3-9 FORECASTED TOTAL ANNUAL OPERATIONS 3-13
FIGURE 3-10 CURRENT AND FORECASTED AIRCRAFT OPERATIONS BY TYPE 3-14
FIGURE 3-11 TOTAL ANNUAL OPERATIONS FORECAST BY TYPE 3-14
FIGURE 3-12 CANYONLANDS FIELD SEASONAL USE 3-15
FIGURE 4-1 AIRCRAFT CHARACTERISITCS DIAGRAM 4-5
FIGURE 4-2 RUNWAY LENGTH ANALYSIS 4-9
FIGURE 4-3 TAXIWAY A 4-11
FIGURE 4-4 COMMERCIAL SERVICE ARPON 4-13
FIGURE 4-5 SKYWEST AIRLINES TICKET COUNTER 4-17
FIGURE 4-6 CUTE SYSTEM EXAMPLE 4-17
FIGURE 4-7 PASSENGER BOARDING GATE 4-18
FIGURE 4-8 14 CFR PART 77 SURFACES 4-27

ALTERNATIVE AND FINANCIAL PLAN FIGURES LOCATED AT THE END OF RESPECTIVE CHAPTERS

CHAPTER ONE

INTRODUCTION

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER ONE
INTRODUCTION

1.1 Introduction

Grand County, Utah, as the Airport Sponsor, is continuing its efforts to plan for future development of Canyonlands Field. Armstrong Consultants, Inc. was tasked to undertake this Airport Master Plan (AMP) update for Canyonlands Field located near Moab, Utah. The future development shown in the AMP is designed to enhance air and ground operations and safety, and to accommodate existing and forecasted aircraft and passenger demand. The preparation of this AMP is evidence that Grand County recognizes the significance of air transportation to the community as well as the requirement for a systematic approach to evaluating the Airport's unique operating and improvement needs.

Figure 1-1 Canyonlands Field

1.2 Purpose

The purpose of the AMP is to provide a framework to guide future airport development that cost-effectively satisfies local and regional aviation demand, while producing an efficient and economically viable facility. The AMP considers the potential environmental, socioeconomic and financial costs associated with alternative development concepts as well as the means of avoiding, minimizing, or mitigating impacts to an appropriate level of detail for facilities planning.

The document describes and depicts the overall concept for short, medium and long-term development of an airport. It presents the concepts graphically in the Airport Layout Plan (ALP) drawing set and reports the data and logic upon on which the concept is based in the AMP narrative report.

1.3 Objectives

The primary objectives of the AMP are to produce an attainable phased development plan concept that will satisfy the airport's needs in a safe, efficient, economical and environmentally sound manner. Goals and objectives are integral to the definition and validity of any plan and serve to frame and direct the definition of options, and more importantly, to establish evaluation criteria to be used in assessing the viability and benefits of such options. The plan serves as a guide to decision makers, funding agencies, airport users and the general public for implementing airport development actions while considering both airport and community concerns and objectives. There are a number of objectives that the Airport intends to achieve as a result of this AMP.

Objectives of the Airport Master Plan include:

- Document the airport needs that the proposed development will address.
- Justify the proposed development through the technical, economic and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport.
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term Capital Improvement Program (CIP).
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the potential environmental impacts and satisfies local, state and Federal regulations.
- Document policies and future aeronautical demand to support local deliberations on spending, debt, land use controls and other policies necessary to preserve the integrity of the airport and its surroundings.
- Set the stage and establish the framework for a continuing planning process that will monitor key conditions and permit changes in plan recommendations as required.

1.4 Airport Master Plan Process and Schedule

Airport planning takes place at a national, state, regional and local level. These plans are formulated on the basis of overall transportation demands and are coordinated with other transportation planning and comprehensive land use planning agencies. The National Plan of Integrated Airport Systems (NPIAS) is a ten-year plan continually updated and published by the FAA. The NPIAS lists developments at public use airports that are considered to be of national interest and thus eligible for financial assistance for airport planning and development under the Airport and Airway Improvement Act of 1982. Statewide Integrated Airport Systems Planning identifies the general location and characteristics of new airports and the general expansion needs of existing airports to meet statewide air transportation goals. This planning is performed by state transportation or aviation planning agencies. Regional Integrated Airport Systems Planning identifies airport needs for a large regional or metropolitan area. Needs are stated in general terms and incorporated into statewide systems plans. The Airport Master Planning process involves collecting data, forecasting demand, determining facility requirements, studying various alternatives and developing plans and schedules. The flow chart in **Figure 1-2** depicts the steps in the master planning process. This process will take into consideration the needs and concerns of the airport sponsor, airport tenants and users, as well as the general public. The AMP is prepared by the operators of individual airports and is usually completed with the assistance of consultants.

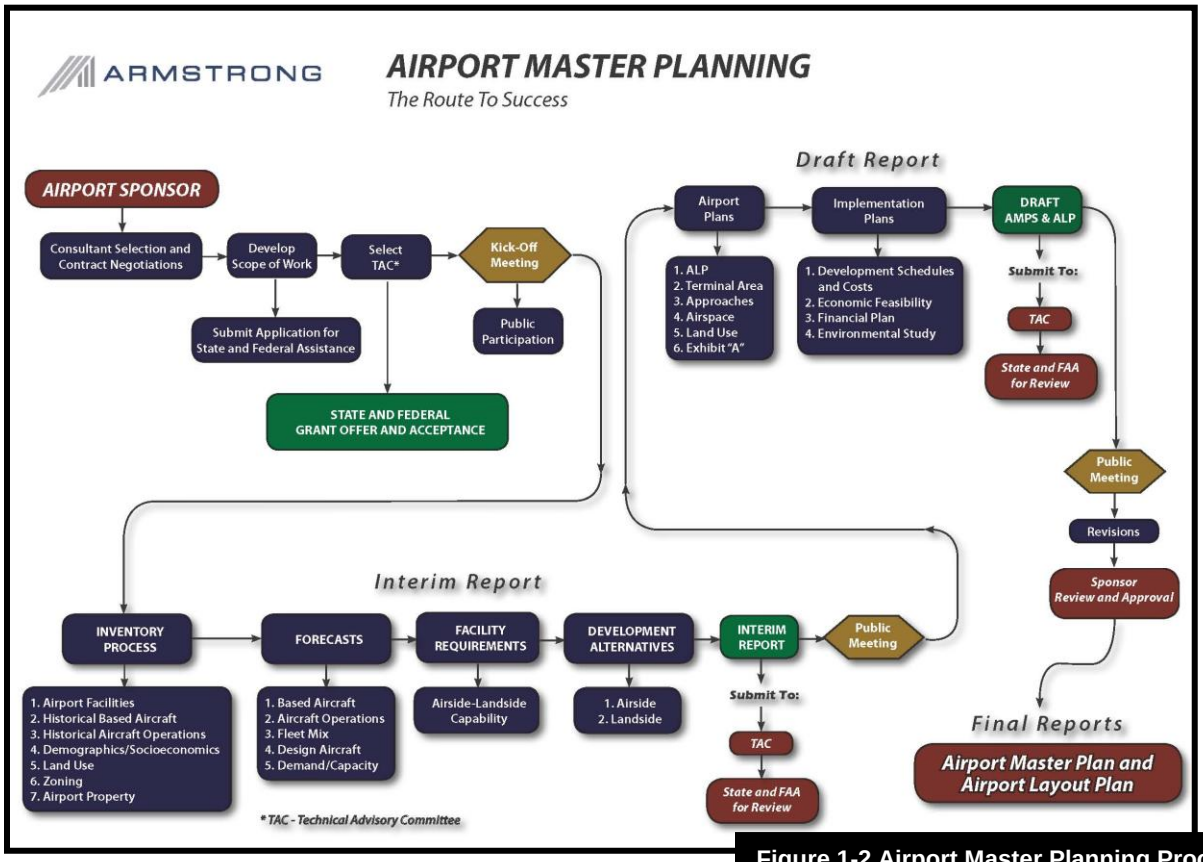


Figure 1-2 Airport Master Planning Process

1.5 Technical Advisory Committee

The Canyonlands Field Technical Advisory Committee (TAC) for this Master Plan consists of members of Airport Management and the Airport Board. Their involvement throughout the Master Plan process will aid in keeping interested parties informed and will foster consensus for future development actions. The final decision authority for the plan is the Grand County Council, which serves as the airport owner and sponsor.

TAC REPRESENTATIVES

- Judd Hill, Airport Manager
- Bill Groff, Airport Board Chairman
- Bill Hawley, Airport Board Member
- Bill Joss, Airport Board Member
- Mark Francis, Redtail Aviation
- John Sweeney, Federal Aviation Administration
- Matthew Swapp, Utah Department of Transportation

CHAPTER TWO

AIRPORT INVENTORY

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER TWO
AIRPORT INVENTORY

2.1 Airport History and Introduction

Airport Overview and History

Canyonlands Field is a publically owned and operated commercial service airport located in Grand County, Utah approximately 18 miles northwest of the City of Moab. The airport is owned and operated by Grand County and is located within unincorporated Grand County. The Airport Manager oversees the long-term strategic plan of the airport and provides recommendations to the Airport Board regarding airport operations, maintenance, and future development. The Airport Manager and staff are responsible for the daily oversight of the airport.

Originally, the airport serving Moab was located south of the city. In 1964, the airport was relocated to its current location. Between 1964 and 1985, the airport was served by Runway 15-33. However, the runway encountered several structural issues related to the high amount of Mancos Shale beneath the pavement section and was closed. Runway 3-21 was constructed in 1985 as a replacement to the previous runway and serves the airport today. Numerous projects to the airport have been undertaken throughout the years including the construction of a passenger terminal building, vehicle parking areas and an Aircraft Rescue and Fire Fighting (ARFF) station.

Figure 2-1 Canyonlands Field

Today, the airport accommodates commercial air carrier service, scenic air tours, sky diving operations, based personal and business aircraft and a high volume of transient aircraft ranging from small single-engine to large corporate jet aircraft.

History of Commercial Air Service at Canyonlands Field

Commercial air service at Canyonlands Field is subsidized under the United States Department of Transportation's Essential Air Service (EAS) program. The EAS program was developed as a result of the Airline Deregulation Act of 1978, which afforded airlines the ability to select their own destinations and routes free of government control. As a safeguard to protect smaller communities from losing air service, the EAS program was developed. To maintain eligibility in the EAS program, an airport must meet the following criteria:

- Received scheduled commercial air service prior to October 24, 1978
- Ten passenger enplanements per day (exemption provided for airports located 175 miles or more from nearest large or medium hub airport)
- Average passenger subsidy is less than $200 (exception provided for airports located 210 miles or more from nearest large or medium hub airport)

Currently, Canyonlands Field meets or exceeds each of the criteria to remain EAS funding eligible. **Table 2-1** lists recent air carriers which have served the airport under EAS subsidies.

Table 2-1 Recent Air Carrier Service at Canyonlands Field

Years Served	Airline	Aircraft Flown	Destinations Served
2003 – 2005	Salmon Air	Piper Chieftain	Salt Lake City, Utah
2005 – 2007	Mesa Airlines	Beechcraft 1900	Salt Lake City, Utah
2007 – 2014	Great Lakes Airlines	Beechcraft 1900	Denver, Colorado Las Vegas, Nevada (via Page, Arizona)
2014 – 2015	SkyWest Airlines	Embraer 120	Salt Lake City, Utah
2015 – Present	Great Lakes Airlines	Embraer 120	Denver, Colorado

Local History

The area containing Grand County and the City of Moab was historically inhabited by the Ute and Navajo Indian tribes. During the 1850's, Brigham Young and Leaders of the Church of Jesus Christ of Latter Day Saints had sent settlers to the area to establish control points in Southeastern Utah. The area also became home to cowboys and ranchers during this time period and established a full settlement in the 1880's. Today, Canyonlands Field serves as a gateway to two of the United States' premier national parks; Arches National Park and Canyonlands National Park. Southeastern Utah provides numerous outdoor recreational activities which has attracted visitors throughout the world.

Inventory Purpose and Role

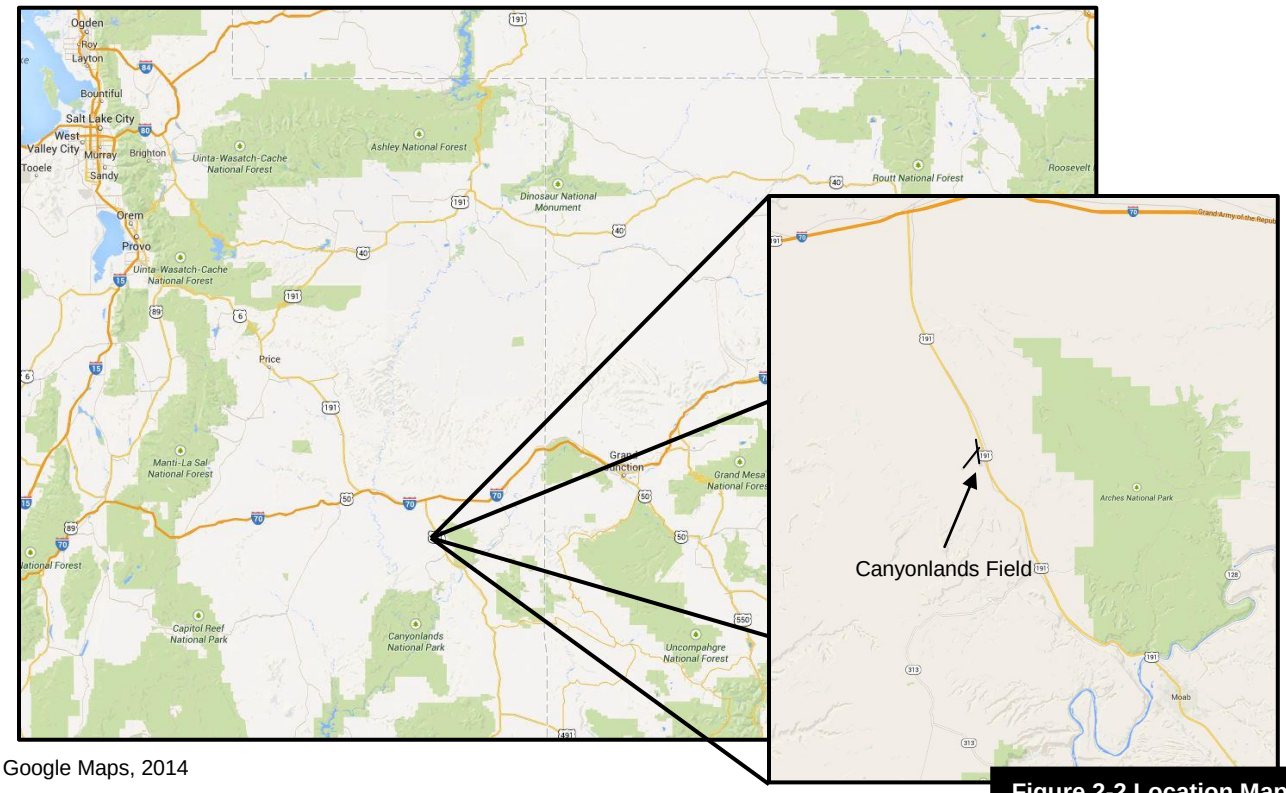
This chapter documents the airport's facilities and the degree to which standards and regulations are met at the airport today. Deficiencies in the existing conditions are evaluated and improvement alternatives are presented in later chapters within the report. The preparation and collection of meaningful data on the airport usage and the condition of its components are basic to developing a sound master plan. The development of this master plan requires the collection and evaluation of baseline information relating to the airport's property, facilities, services and local vicinity. The information presented in this chapter combined with aviation activity forecasts and the demand/capacity analysis will serve as the basis in determining any necessary airport improvements, maintenance or expansions. Inventory information was obtained during field visits and interviews with Airport Management, Grand County staff, tenants and users.

2.2 Airport Management and Ownership Structure

Canyonlands Field is under ownership of Grand County, Utah. The governmental body assumes responsibility to provide financing and operational support to the airport. Canyonlands Field is guided by an Airport Advisory Board. Through this organizational structure, an Airport Board collectively advises the County on airport planning and strategy. Currently, the Canyonlands Field Airport Board is comprised of eight board members. The Airport Manager reports directly to the Grand County Council to implement their decisions and oversee day-to-day airfield operations.

2.3 Airport Location

Canyonlands Field is located in the southeast portion of Utah within the south-central portion of Grand County. The airport is situated in Section 6 of Township 24 South and Range 19 and 20 East of the Salt Lake Meridian. **Figure 2-2** provides a graphic depiction of the location of the airport in relation to the City of Moab. The airport is designated by the FAA as Site Number 25205.1*A with the three-letter identifier CNY and is a public-use airport. The Airport Reference Point (ARP) is Latitude 38˚45' 17.86" North and Longitude 109˚45' 17.44" West according to the 2012 As-Built Airport Layout Plan. The airport's elevation is 4,557 feet Mean Sea Level (MSL) and has a B-II Airport Reference Code (ARC). The ARC is determined from the highest Runway Design Code (RDC) at the airport. The existing airport property encompasses approximately 985 acres which is owned by Grand County.



Source: Google Maps, 2014

Figure 2-2 Location Map

2.4 Airport Grant History

The Airport Improvement Program (AIP) is the FAA grant program that provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). For small primary, reliever and general aviation airports, the grant covers up to 95 percent of eligible costs. Eligible projects include improvements related to enhancing airport safety, capacity, security and environmental concerns. Airports can use AIP funds on most airfield capital improvements or repairs and in some specific situations, for terminals and hangars. Professional services necessary for eligible projects such as planning, surveying and engineering are eligible; however, aviation demand at the airport must justify the projects and also meet federal environmental and procurement requirements. A federal grant history for the capital improvements at the Canyonlands Field is provided in **Table 2-2**.

Under the most recent FAA AIP legislation, capital improvement projects for small hub and nonhub airports within the State of Utah are typically funded at 90.63 percent by the FAA. The Airport Sponsor and Utah Department of Transportation are responsible for contributing the remaining 9.37 percent.

Table 2-2 FAA Grant History

Year	AIP Number	Project Description	Grant Amount
1985	3-49-0020-01	Construct Runway 3-21 (Design Only)	$138,810
1985	3-49-0020-02	Construct Runway 3-21 (Site Prep)	$463,165
1986	3-49-0020-03	Construct Runway 3-21	$847,933
1987	3-49-0020-04	Reconstruct Apron; Rehabilitate portion of Runway 3-21	$116,998
1990	3-49-0020-05	Master Plan Study	$27,282
1992	3-49-0020-06	Expand Apron; Construct by-pass taxiway; Install MITL and signs	$325,000
1993	3-49-0020-07	Rehabilitate apron; Pave by-pass taxiway; Install MITL; Rehabilitate beacon; Construct taxilanes	$332,600
1993	3-49-0020-08	Environmental assessment for Runway 3-21 extension	$32,982
1995	3-49-0020-09	Land acquisition and obstruction removal	$1,380,000
1996	3-49-0020-10	Extend Runway 3-21; Construct parallel taxiway; Construct helipads; Install REIL's; Expand apron; Update ALP	$1,839,058
2000	3-49-0020-11	Rehabilitate runway 03/21; Install wildlife fence; Install airport lighting; Rehabilitate apron; Update ALP	$835,000
2001	3-49-0020-12	Accommodate security equipment (improve terminal building)	$5,911
2002	3-49-0020-13	Expand Apron design	$55,291
2003	3-49-0020-14	Expand Apron (site prep)	$388,798
2004	3-49-0020-15	Expand Apron; install guide signs; Rehab Runway 3-21	$430,186
2005	3-49-0020-16	Improve Runway 3-21 safety area design	$344,375
2006	3-49-0020-17	Improve Runway 3-21 safety area	$2,530,777
2007	3-49-0020-18	Rehabilitate Runway 3-21 lighting design	$61,750
2009	3-49-0020-19	Rehabilitate Runway 3-21 lighting (construction Ph. I)	$123,693
2009	3-49-0020-20	Rehabilitate Runway 3-21 lighting (construction Ph. II)	$344,557
2010	3-49-0020-21	Acquire ARFF Equipment	$612,449
2011	3-49-0020-22	Rehabilitate Runway 3-21, Taxiways A, A1, A3, A4, A5, A6 and A7, and Apron	$540,000
2011	3-49-0020-23	Construct ARFF building	$325,000
2012	3-49-0020-24	Improve Access Road, Rehab Parking Lot (Phase I)	$300,000
2013	3-49-0020-24	Improve Access Road, Rehab Parking Lot (Phase II)	$150,000
FAA Grant Total			**$12,551,615**

Source: FAA, 2014

2.5 Airport Classification

The State of Utah has a wide range of aviation facilities from unpaved airstrips to large commercial service airports. Due to this variety, there is a need for classification of these facilities to determine operating parameters and design standards.

Canyonlands Field is classified by two separate methods:

- National Plan of Integrated Airport Systems (NPIAS) – Identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the AIP.

- Utah Continuous Airport System Plan (UCASP) – This plan is similar to the NPIAS, however, at a state level. The plan was developed by the Utah Department of Transportation (UDOT).

These classifications establish the abilities and purpose the airport serve at a state and national level.

2.5.1 NPIAS Service Level

The NPIAS is a biannual report to Congress that establishes and identifies the role airports serve in the National Airspace System and quantifies their total capital development needs. The criteria for airport classification in the NPIAS are listed in **Table 2-3**. To be eligible for AIP funding, the facility is required to be included in the NPIAS. In the 2015-2019 Report, a total of 3,283 airports, 10 heliports, 38 seaplane bases, and 14 proposed airports comprised the 3,345 NPIAS facilities in the United States. The NPIAS places airports into the following categories:

- Commercial Service Airports – These are defined as public airports receiving scheduled passenger service and having 2,500 or more enplaned passengers per year. These commercial service airports are broken into two categories:

    - Primary – These airports enplane more than 10,000 passengers annually, they are further broken down into Large Hub, Medium Hub, Small Hub, and Nonhub Primary. The additional classifications are determined by percentage of total U.S. passenger enplanements. There are 389 airports classified as Primary.

    - Nonprimary – These airports enplane between 2,500 and 9,999 passengers annually. There are 125 airports classified as Nonprimary.

- General Aviation Airports – These airports do not meet commercial service criteria but typically have at least 10 based aircraft and are at least 20 miles from the next closest NPIAS airport. There are 2,553 airports classified as General Aviation.

- Reliever Airports – These airports are designated to relieve general aviation traffic from hub airports. They are primarily located near major metropolitan areas. The requirements for this classification are: for public-use and have more than 100 based aircraft OR at least 25,000 annual itinerant operations. There are 264 airports classified as Reliever.

- New Airports – These are airports that are anticipated for development within the five year planning window. There are 14 airports classified as New.

Canyonlands Field is classified in the NPIAS as a Nonprimary - Commercial Service airport.

Table 2-3 NPIAS Airport Classification Criteria

Classification		Hub Type: Percentage of Annual Passengers Enplaned
Commercial Service: Airports that receive scheduled passenger and have >2,500 enplaned passengers per year.	Primary: >10,000 enplaned passengers per year	Large: 1% or greater
		Medium: >0.25% but <1%
		Small: >0.05% but <0.25%
		Nonhub: <0.05% but >10,000 annual enplanements
	Nonprimary: >2,500 but <10,000 enplaned passengers per year	Not Applicable
General Aviation: >10 based aircraft and >20 miles to nearest NPIAS airport.		Not Applicable
Reliever: Public use, near congested hub airport and >100 based aircraft OR >25,000 annual itinerant operations		Not Applicable
New: To be developed within the five year planning window		Not Applicable

Source: FAA, 2013

2.5.2 Utah Continuous Airport System Plan

In 2008, UDOT funded the Utah Continuous Airport System Plan (UCASP) which is comprised of 47 public-use airports in the state. **Table 2-4** lists the number of public-use airports by classification. The UCASP evaluated the facilities by the purpose they serve. The UCASP categorized and defined the airports into the following classifications:

- International Airport – Provides essential national and international commercial airline access. Salt Lake City International Airport is the only airport in the State of Utah with this classification.

- National Airport – Accommodate a high level of commercial service and general aviation activity and serve major population centers or tourism destinations in the state. St. George Municipal Airport and Wendover Airport are the two National Airports in the state.

- General Aviation-Regional – Serve primarily general aviation activity, including jet and multi-engine aircraft and provide access to major population centers. Although, some GA-Regional airports offer commercial passenger service.

- General Aviation-Community – Provide aviation access to smaller population centers and are used for emergency air medical operations, business, recreational and personal flying activities.

- General Aviation-Local – Have local importance, primarily serving recreational and personal flying activities.

Canyonlands Field is classified in the UCASP as a General Aviation-Regional Airport.

Table 2-4 Utah Airports by Classification

Classification	Total
International Airports	1
National Airports	2
Regional Airports	18
Community Airports	13
Local Airports	12
Total	**46**

Source: Utah Continuous Airport System Plan, 2008

2.6 Airport Role

Canyonlands Field provides aviation access to the City of Moab, Grand County, and entire region of southeastern Utah. Airport users include:

- Airline Transportation – The current EAS contract is with Great Lakes Airlines operating the Embraer 120 Brasilia turboprop to Denver, Colorado.

- Business Transportation – Business aviation users benefit by being able to travel to or from local business centers to conduct activities in a single day, without requiring an overnight stay or extensive ground travel time. Local and other small businesses generally utilize single and multi-engine piston aircraft. Medium sized businesses and larger corporations having a need to travel to the Moab area generally utilize multi-engine piston, turboprop, or light to medium business jets. This user category also includes all travel conducted by governmental authorities.

- Personal Transportation – These users desire the utility and flexibility offered by general aviation aircraft. The types of aircraft utilized for personal transportation vary with individual preference or resources. The mix of aircraft includes a variety of single or multi-engine and occasionally turbojet aircraft.

- Recreational and Tourism – These users include transient pilots flying into the region to visit recreational and tourist attractions. These users typically utilize single-engine piston aircraft; however, a small percentage may operate multi-engine piston or larger aircraft.

Other types of aircraft in this category often include home-built, experimental aircraft, gliders and ultralights. Aviation businesses at Canyonlands Field include scenic and charter flights operated by fixed-wing, helicopter or hot air balloon, multiple sky diving operations and air freight deliveries.

- Flight Training – These users conduct local and itinerant flights in order to meet flight proficiency requirements for obtaining FAA pilot certifications. These flights include touch-and-goes, day and night local and cross-country flights and practice approaches. Pilot certifications include Sport, Private, Instrument, Commercial, Instructor and Airline Transport ratings. Depending on the level of interest and aircraft availability, a multi-engine rating may or may not be available. A commercial rating may be accomplished with either a single-engine or multi-engine aircraft. Air transport ratings are usually obtained at larger regional FAR Part 141 certificated flight schools. Flight training is provided by Redtail Aviation.

- Aircraft Maintenance – Redtail Aviation provides maintenance services to based and transient aircraft. Services include but are not limited to: 100-hour inspections, annual inspections and various repairs.

- Air Medivac – Air medivac provides essential emergency medical transport in life threatening situations and patient transfers to and from other hospitals and health care facilities throughout the region. These users utilize a variety of fixed – wing multi-engine turboprop and turbojet aircraft and helicopters.

- Military – The airport is currently utilized by the military for occasional fuel stops and local operations.

2.7 Regional Setting, Topography and Terrain

The City of Moab is located at an elevation of approximately 4,025 feet MSL. The terrain surrounding the airport within a ten mile radius is generally considered mountainous. The airport is located near the Colorado River. A map depicting the topography surrounding Canyonlands Field is shown in **Figure 2-4**. Canyonlands Field is the nearest commercial service airport to both Arches National Park and Canyonlands National Park, located 13 miles and 31 miles away, respectively. Also located in vicinity of Canyonlands Field are Dead Horse State Park and the Sand Flats Recreational Area, which is home to the world famous Slick Rock Biking Trail. The area is open to several recreational activities including horseback riding, fishing, hunting, and hiking. Moab serves as a regional center for business, healthcare, shopping and entertainment.

Figure 2-3 Arches National Park

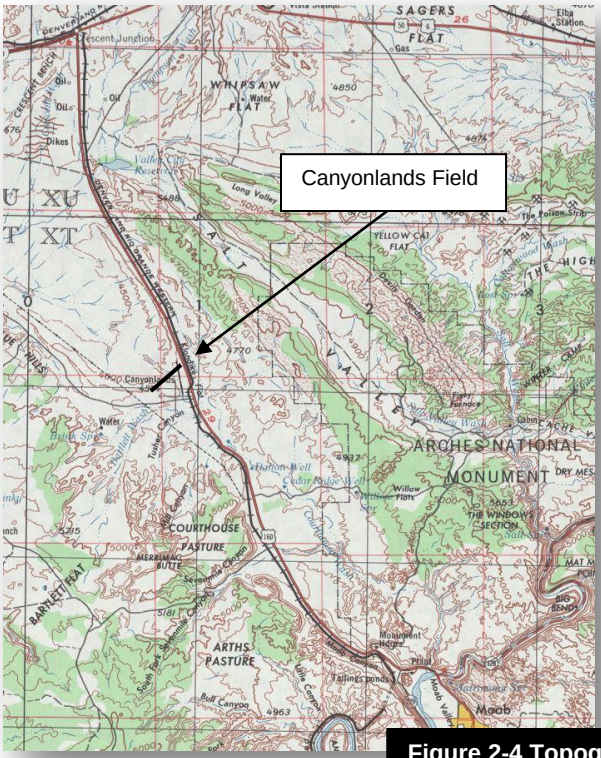


Figure 2-4 Topographical Map

Source: Zonu, 2014

2.8 Socioeconomic Factors

Examining the specific socioeconomic characteristics of Grand County, the City of Moab and the airport service area will help determine the factors that influence aviation activity and the extent to which aviation facility developments are needed at Canyonlands Field. Characteristics, such as employment, tourism demographic patterns and income will help in establishing the potential growth rate of aviation within the area. By analyzing the information in this chapter, forecasts and projections of aviation activity can be developed and are provided in Chapter Three, *Forecasts of Aviation Activity*.

2.8.1 Local Profile

The City of Moab is a large commercial/industrial center for southeastern Utah. According to the U.S. Census Bureau, the largest single industries in the region are tourism/recreation, education/health care, and retail.

2.8.2 Population

There were 9,225 people residing in Grand County and 5,046 people residing in Moab as indicated by the 2010 U.S. Census Bureau. According to recent population estimates from the U.S. Census Bureau, the population for Grand County grew to 9,360 and 5,130 for Moab in 2012.

Projections pertaining to population data were developed for Grand County by the Utah Governor's Office of Management and Budget, as shown in **Table 2-5,** indicates a forecasted 1.04 percent annual average growth (AAG) for Grand County from 2010 through 2060. **Figure 2-5** shows the historical and projected population outlook for Grand County.

Table 2-5 Historical and Forecasted Population

	Grand County	AAG
Historical		
1990	6,622	2.24%
2000	8,531	0.75%
2010	9,225	1.04%
Forecast		
2020	10,300	1.04%
2030	11,300	1.04%
2040	12,147	1.04%
2050	13,098	1.04%
2060	14,301	1.04%

Source: Utah Governor's Office of Management and Budget, 2014

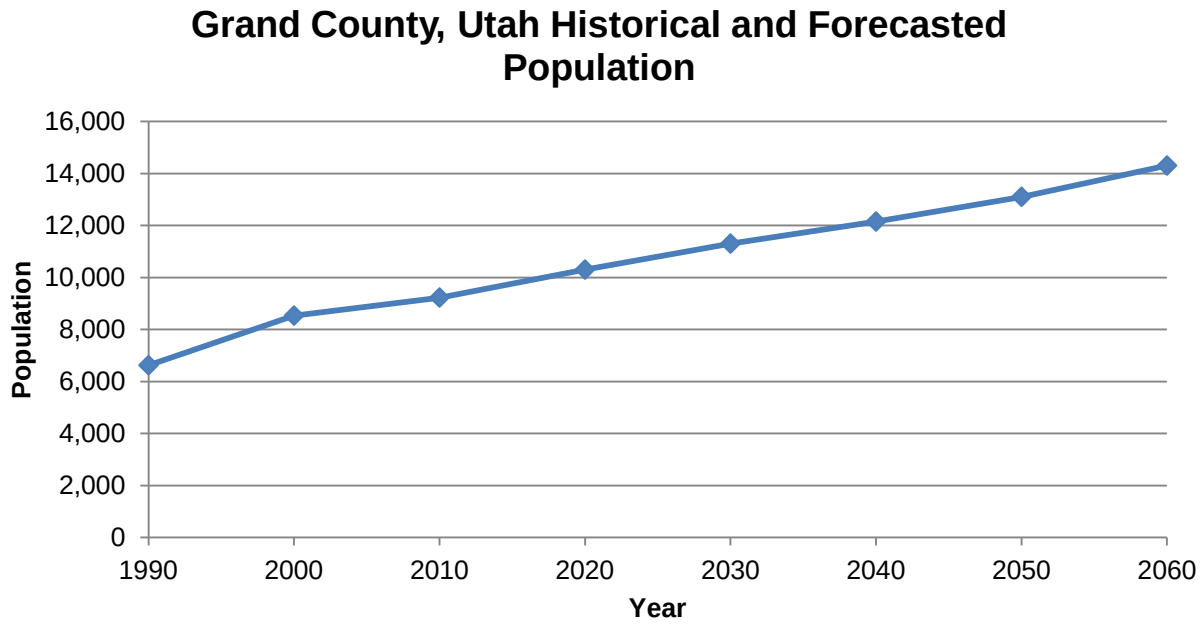


Figure 2-5 Historical and Forecasted Population

2.8.3 Employment

As previously noted, according to the 2012 U.S. Census Bureau, the largest industries in Grand County are tourism/recreation, education/health care, and retail. This indicates a region which depends strongly on visitors to the area for economic growth. According to the U.S. Census, there are 1,261 businesses in Grand County. The types of jobs within the Airport's service area affect aviation demand. Typically, careers in manufacturing and service industries tend to generate more aviation activity than resource industries such as agricultural or mining.

According to the U.S. Bureau of Labor Statistics, the unemployment rate for Grand County was 4.0 percent in July 2014 – less than that of the United States (5.9 percent) but greater than the State of Utah (3.6 percent). Employment distribution by industry for Grand County is shown in **Table 2-6**.

Table 2-6 Grand County Employment Distribution

Industry	2012	Total Percent
Agriculture	18	0.46%
Mining	45	1.16%
Construction	431	11.11%
Manufacturing	204	5.26%
Trade, Utilities and Transportation	335	8.64%
Information Technology	59	1.52%
Financial Activities	251	6.47%
Professional and Business Services	339	8.74%
Education and Health Services	726	18.72%
Leisure and Hospitality	936	24.14%
Other Services	118	3.04%
Government	416	10.73%

Source: U.S. Census Bureau, 2012

2.8.4 Income

Historical and future projections for per capita personal income (PCPI) are shown in **Table 2-7**. In 2012, the PCPI for Grand County was $27,135 and increased approximately 5.9 percent annually from $21,205 in 2002. It is assumed the PCPI will continue to grow at the same average annual rate of approximately 2.5 percent through the 20 year planning period.

According to the 2012 U.S. Census Bureau, the median income for a household in Grand County was $42,208 and $38,820 in the City of Moab. The median household income for the State of Utah was $58,164. The percentage of families living below the poverty line in 2012 was 17.6 percent within Moab, 13.6 percent within Grand County and 12.1 percent for the State of Utah.

Table 2-7 Per Capita Personal Income (PCPI) Growth

Year	Grand County
Historical	
2002	$21,205
2012	$27,135
2014 (Projected)	$30,337
Forecast	
2019	$40,407
2024	$53,818
2029	$71,682
2034	$95,475
AAG	**5.9%**

Source: Bureau of Economic Analysis, 2014

2.8.5 Additional Growth Indicators

Additional growth indicators include building permits, taxable sales and net assessed valuation. According to the U.S. Census Bureau, there were 79 commercial and residential building permits issued in 2012.

As mentioned, both Arches and Canyonlands National Parks provide a significant draw to visitors to the area. The two parks hosted a combined 1.5 million visitors in 2013. The impacts of the parks on Canyonlands Field are further discussed in Chapter Three, *Forecasts of Aviation Demand*.

2.9 Certificated Airmen and Registered Aircraft

The FAA Aircraft Registration Inquiry and Certificated Airmen databases were reviewed to determine current distribution of pilots and registered aircraft in Moab and the Grand County area. This data indicates there are nine student pilots, 14 private pilots, 19 commercial pilots, and four airline transport pilots for a total of 46 certificated airmen and 26 registered aircraft in Grand County.

2.10 Based Aircraft and Operations

The number of based aircraft, operations and fleet mix was based on the information found in the FAA Form 5010, *Airport Master Record,* and the Airport Manager. According to the Form 5010 for 2013, there were 33 based aircraft and 9,900 total annual operations. Based on discussions with airport management, the 5010 activity levels for operations are not considered to be accurate. According to the Airport Manager, there are 31 based aircraft at Canyonlands Field. **Table 2-8** depicts the number of current based aircraft and total annual operations.

Table 2-8 Based Aircraft and Operations in 2014

Based Aircraft	
Fixed Wing Single-Engine	31
Total	**31**
Operations	
Air Carrier	0
Air Taxi and Commuter	4,000
General Aviation – Local	7,500
General Aviation – Itinerant	3,500
Military	250
Total	**15,250**

Source: FAA Form 5010, *Airport Master Record* and Airport Management, 2015

2.11 Passenger Enplanements

Canyonlands Field receives both scheduled and unscheduled passenger service. The airport is currently contracted with Great Lakes Airlines. The airline schedule includes two daily round trips Thursday through Monday and one daily roundtrip Tuesday and Wednesday to Denver International Airport (DEN). Scheduled flights are operated on the 30-passenger Embraer 120 Brasilia turboprop. **Figure 2-6** depicts the existing and historical non-stop destinations served from Canyonlands Field. Additionally, nonscheduled passenger charter services and scenic air tours are provided by Redtail Aviation, based at Canyonlands Field. Airline passenger enplanements are defined as the total number of revenue passengers boarding aircraft, including originating, stopover and transfer passengers, in scheduled and nonscheduled air carriers and are recorded by service providers and reported to the FAA. The number of enplanements depends on several factors including socioeconomic, aviation trends and ticket prices amongst other things. In 2014, the airport enplaned a total of 9,237 passengers, an increase from 2013's total of 7,048 enplanements. **Table 2-9** and **Figure 2-7** show the Airport's historical enplanement data. Chapter Three, *Forecasts of Aviation Activity*, includes the enplanement forecast for the 20 year planning period.

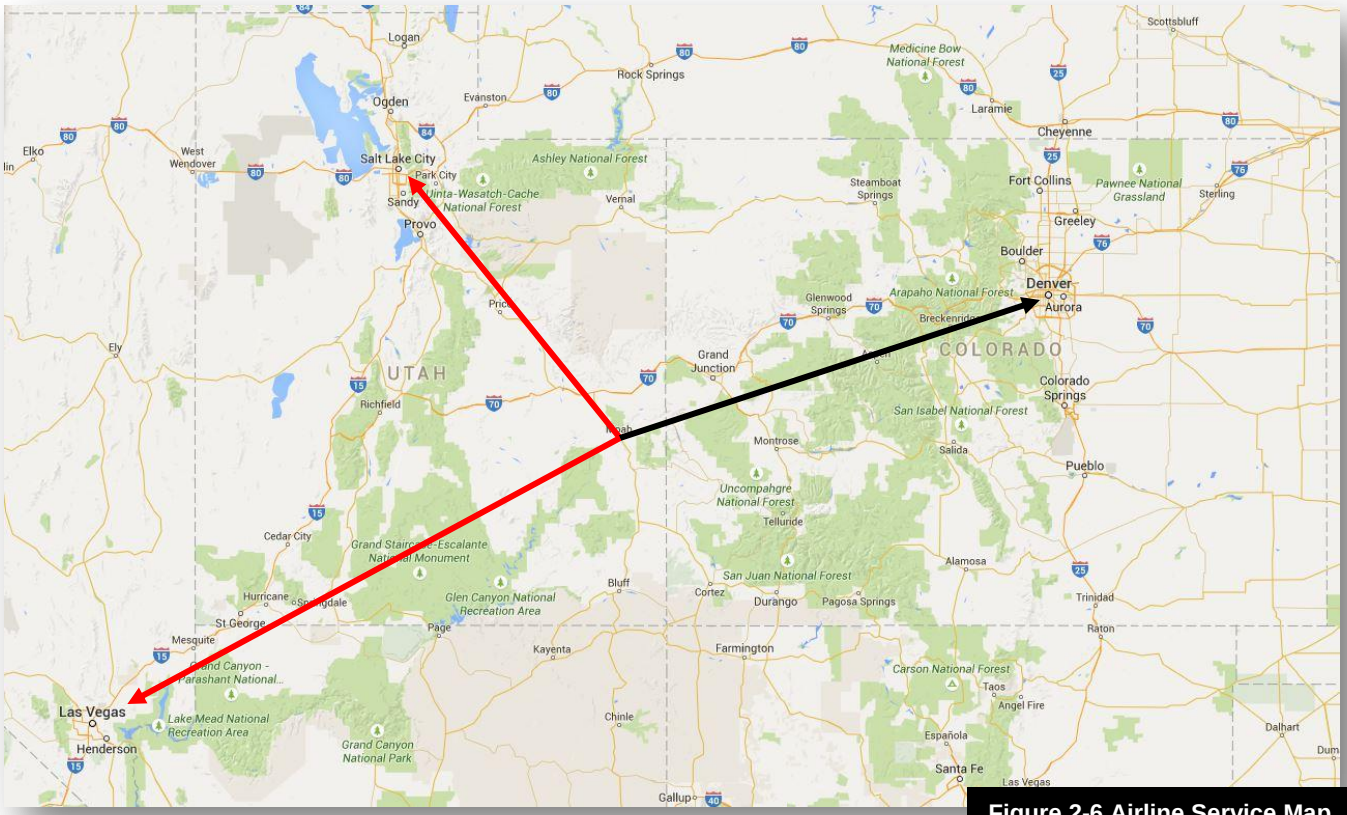


Figure 2-6 Airline Service Map

Source: Google Maps, 2014

Legend
Current Route
Former Route

Table 2-9 Historical Enplanement Data

Year	Total Enplanements	Annual % Change
2004	3,522	-
2005	3,078	14.4%
2006	3,586	14.2%
2007	2,843	26.1%
2008	2,870	0.9%
2009	3,982	27.9%
2010	2,701	47.4%
2011	9,181	70.6%
2012	7,955	15.4%
2013	7,048	12.9%
2014	9,237	23.7%

Source: FAA and Airport Management

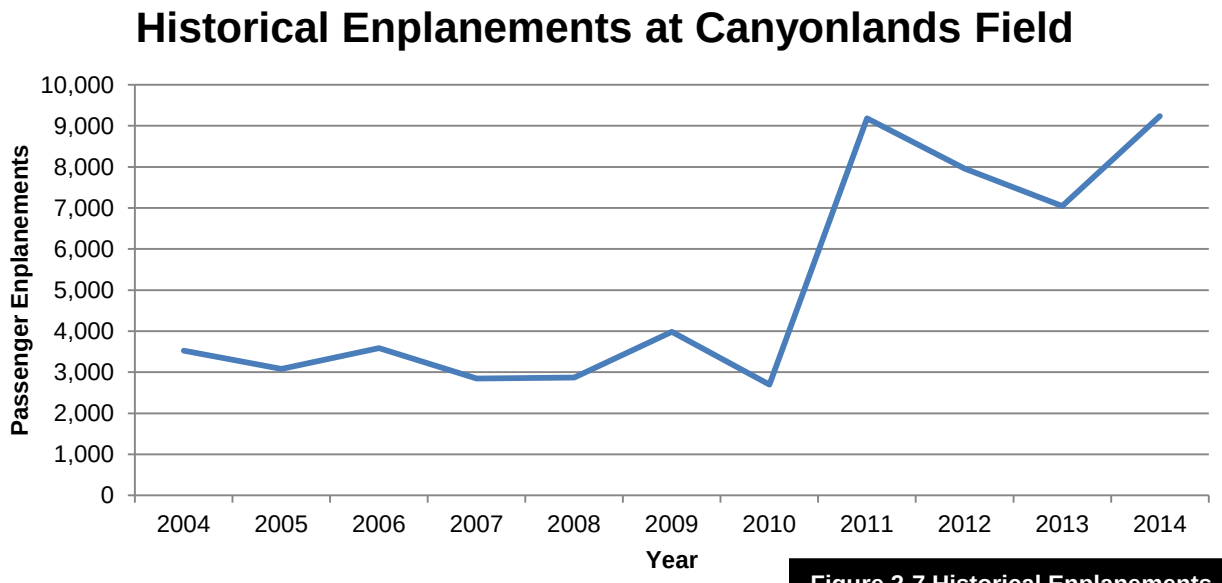


Figure 2-7 Historical Enplanements

2.12 Airport Service Area

2.12.1 Airline Passenger Service Area

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.); proximity to its users; quality of ground access; required driving time to the airport; and, the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Canyonlands Field, the airports in the area and their specific services and facilities were reviewed. The Service Area is depicted in **Figure 2-10** and is home to approximately 28,610 people.

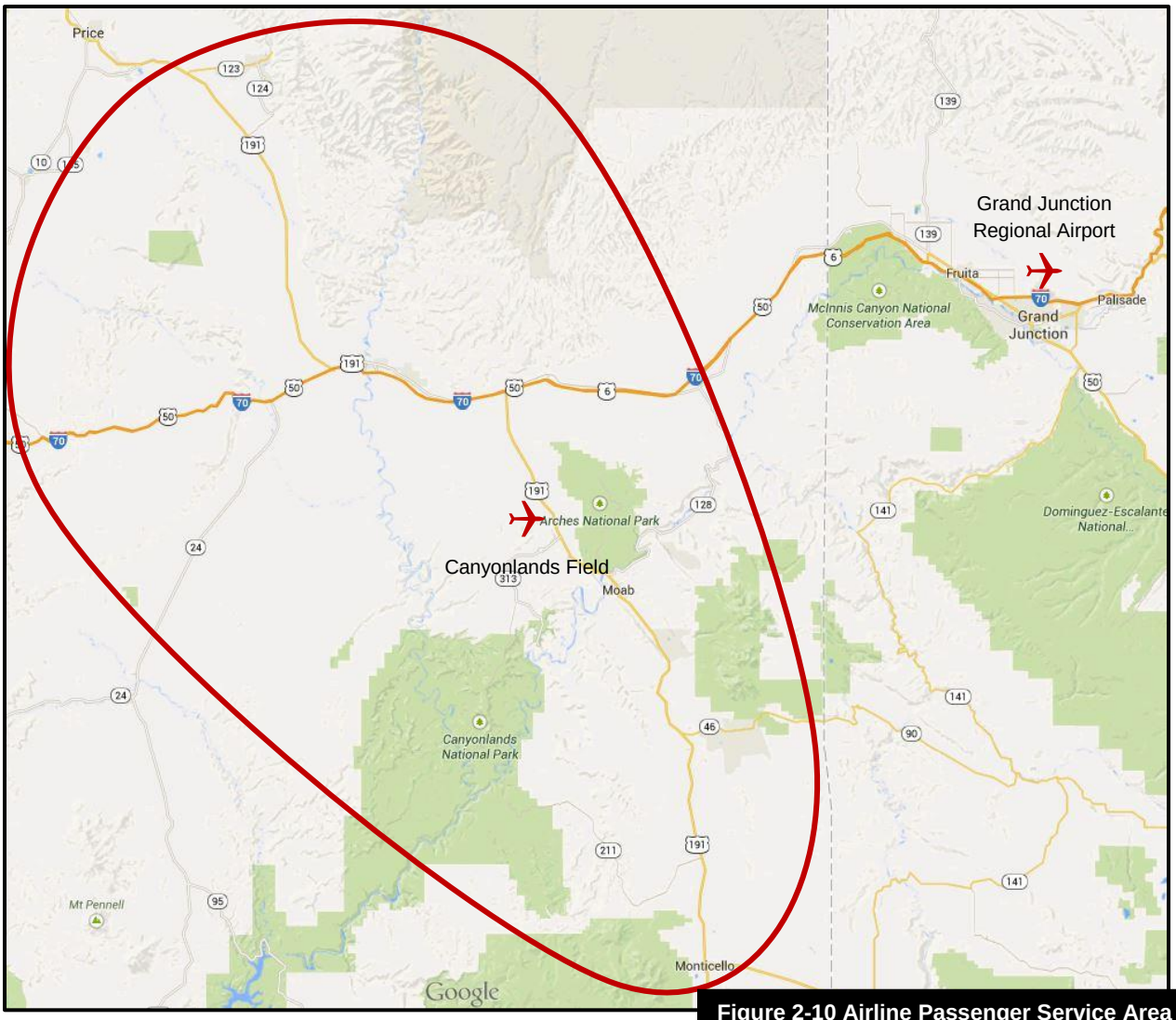
The nearest airport to Moab offering scheduled passenger service is in Grand Junction, Colorado, approximately 120 miles east of Moab. Grand Junction Regional Airport, a non-hub primary commercial service airport, is served by Allegiant Air to Las Vegas, Nevada and Los

Angeles, California; Denver Air Connection to Denver, Colorado and regional carriers operating on behalf of American Airlines to Dallas/Ft. Worth, Texas and Phoenix, Arizona; Delta Air Lines to Salt Lake City, Utah; and United Airlines to Denver, Colorado and Houston, Texas.

The nearest large hub airport is located in Salt Lake City, Utah approximately 250 miles north of Moab. Salt Lake City International Airport is a hub for Delta Air Lines and is served by several major carriers. Destinations served from Salt Lake City International Airport include numerous cities throughout the United States, Canada, Mexico and Europe.

Figure 2-8 SkyWest Airlines EMB-120

Figure 2-9 Redtail Aviation Quest Kodiak



Source: Google Maps, 2014

Figure 2-10 Airline Passenger Service Area

2.12.2 General Aviation Service Area

The general aviation service area, much like the airline passenger service area, is defined by the communities and surrounding areas served by the airport facility. To define the general aviation service area for Moab, the airports in the area and their specific services and facilities were reviewed.

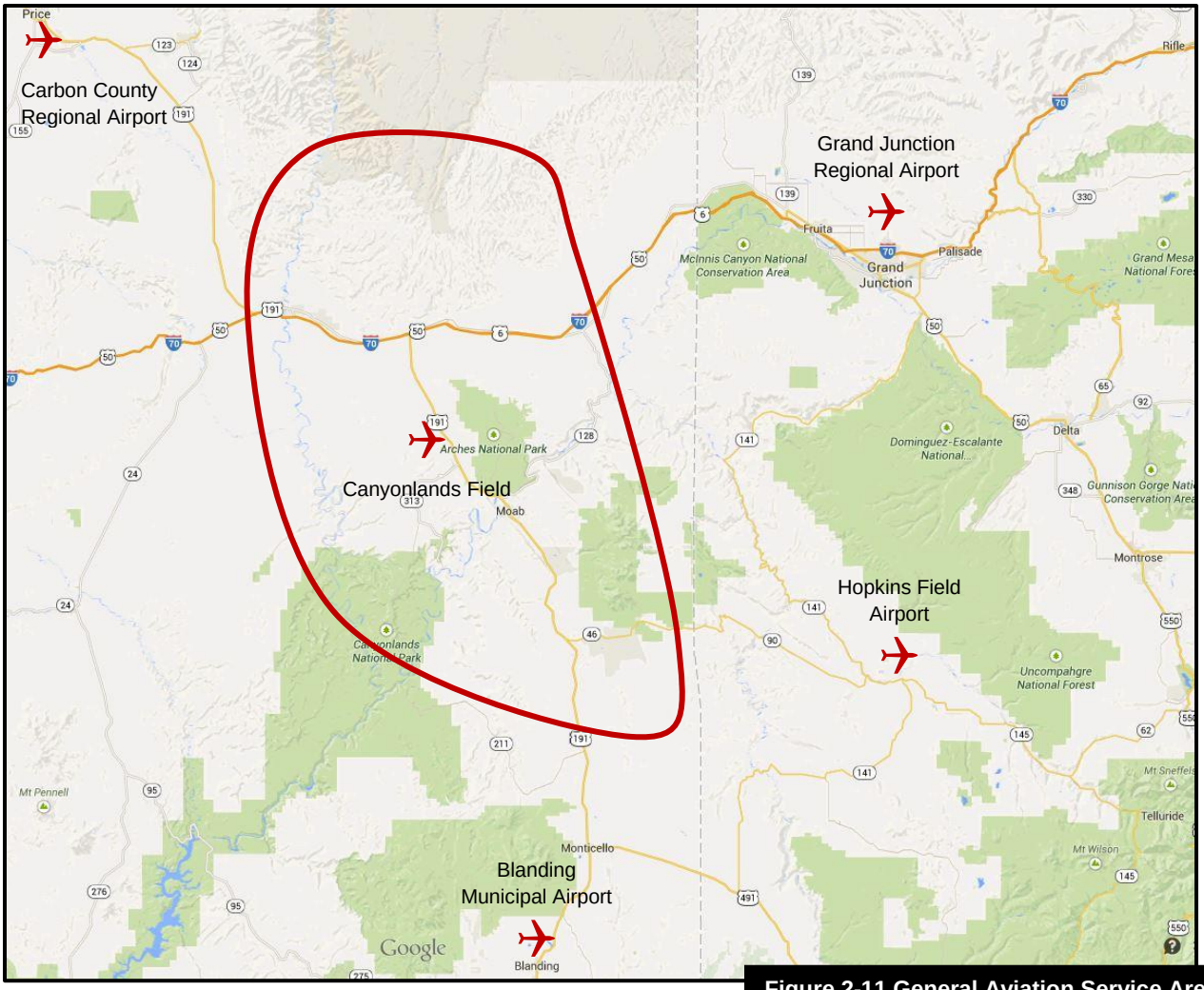
The nearest public use general aviation airport with a paved surface and an instrument approach is located approximately 61 nautical miles east in Grand Junction, Colorado. The service area includes the area within half the distance of the nearest airport with a paved runway and instrument approach from Canyonlands Field. **Table 2-10** depicts the closest airports with instrument approaches.

There are no additional airports within the vicinity of the service area of Moab. The general aviation service area is shown in **Figure 2-11**.

Table 2-10 Moab and Nearby Airports With Instrument Approaches

Airport	ID	Distance (NM)	Distance (Road)	NPIAS Status	Runway Lengths & Widths	Pavement Type	Inst. Approach	Fuel
Canyonlands Field Moab, UT	CNY	-	-	NP-CS	7,100' x 75'	Asphalt	GPS/VOR	100LL & Jet-A
Grand Junction Regional Airport Grand Junction, CO	GJT	61	120	P-CS	10,501' x 150' 5,502' x 75'	Asphalt Asphalt	ILS/GPS VOR	100LL & Jet-A
Hopkins Field Airport Nucla, CO	AIB	64	101	GA	4,600' x 75' 4,000' x 80'	Asphalt Dirt	GPS	100LL & Jet-A
Huntington Municipal Airport Huntington, UT	69V	65	112	GA	4,048' x 75' 3,640' x 70' 2,079' x 56'	Asphalt Dirt Dirt	GPS/VOR	100LL
Carbon County Regional Airport Price, UT	PUC	69	101	GA	8,313' x 100' 4,514' x 75' 3,541' x 75'	Asphalt Asphalt Asphalt	ILS/GPS VOR	100LL & Jet-A
Blanding Municipal Airport Blanding, UT	BDG	71	95	GA	5,781' x 75'	Asphalt	GPS	100LL & Jet-A

Source: AirNav.com, 2014



Source: Google Maps, 2014

✈=Airports with Paved Runway and Instrument Approach

Figure 2-11 General Aviation Service Area

2.13 Existing Airside Facilities

The “airside” of an airport is the portion typically located within the security fenced area, in which aircraft, support vehicles and equipment are located; and in which aviation-specific operational activities take place. **Figure 2-12** provides a visual depiction of existing airside facilities and the facilities are summarized in **Table 2-18**.

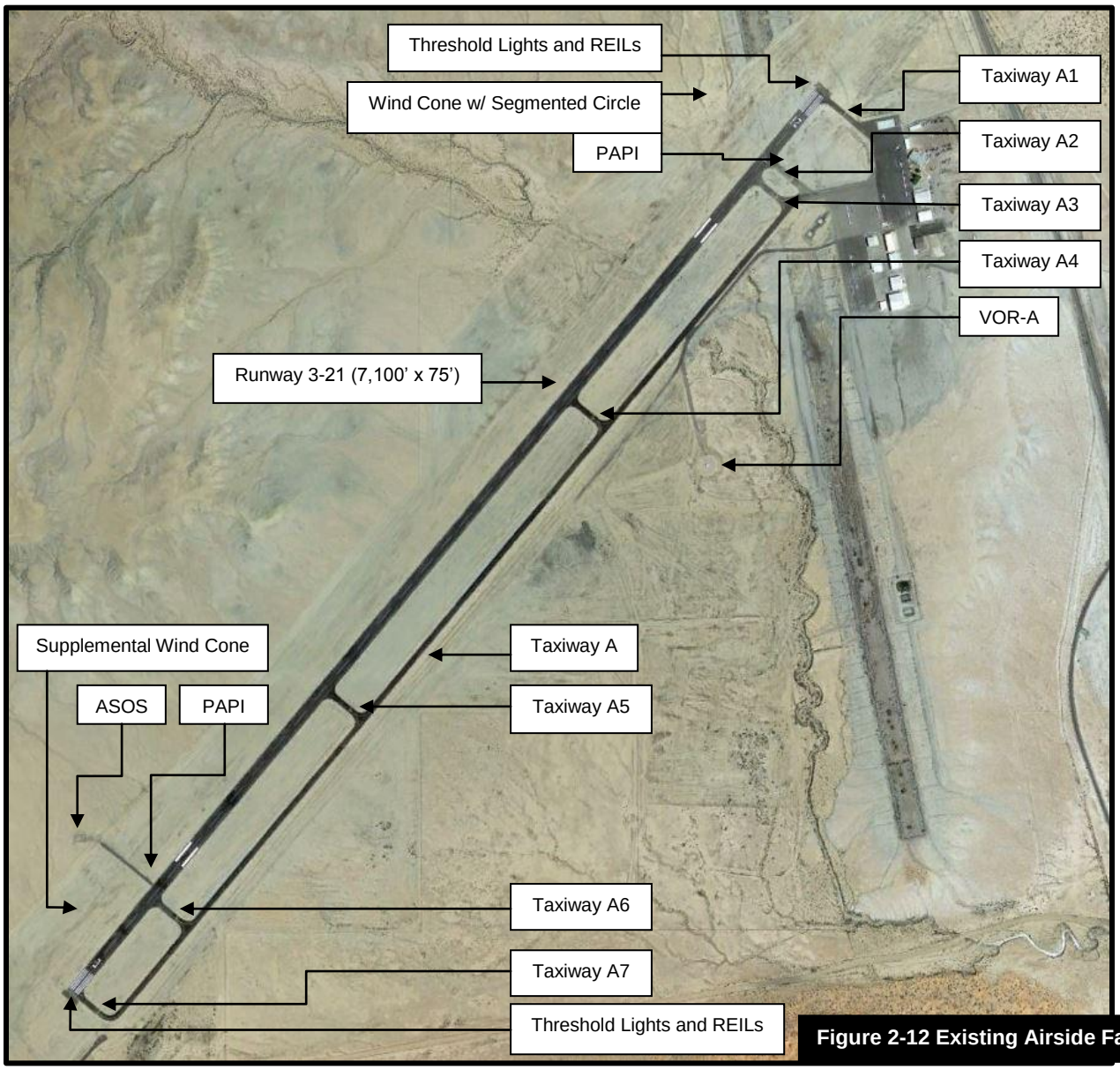


Figure 2-12 Existing Airside Facilities

2.13.1 Runway 3-21

Runways are a defined rectangular surface on an airport prepared or suitable for the landing or takeoff of aircraft. Canyonlands Field has one asphalt-surfaced runway, Runway 3-21.

Runway 3-21, is 7,100 feet long and 75 feet wide and has a published pavement strength of 25,000 pounds Single Wheel Gear (SWG). Runway 3-21 is an asphalt runway and considered to be in good condition. The runway has a porous friction course (PFC) which is a thin asphalt layer designed to drain internally to shed surface water off the runway. Runway 3-21 is considered to be in fair condition according to the current UDOT Pavement Condition Index Survey. The results of the Pavement Condition Index survey are located in **Table 2-11**. Runway 3-21 has nonprecision instrument markings on each runway end which are considered to be in good condition. Runway 3-21 is equipped with Medium Intensity Runway Lights (MIRLs).

Figure 2-13 Runway 3-21 and Taxiways

The runway has a Runway Design Code (RDC) of B-II and the design aircraft is listed on the current ALP as the Beechcraft 1900 turboprop. However, due to a change in fleet mix, the existing design aircraft is the Embraer 120. RDC B-II indicates the runway is designed to accommodate Category B aircraft with an approach speed of 91 knots or more but less than 121 knots and aircraft with a tail height of 20 feet but less than 30 feet and a wingspan greater than 49 feet but less than 118 feet.

2.13.2 Taxiway System

Taxiways provide a surface for aircraft to transition from the parking apron to and from the runways. They expedite aircraft departures from the runway and increase operational safety and

efficiency. All taxiways at Canyonlands Field are 35 feet wide and adhere to the design standards for Taxiway Design Group (TDG) 2. Taxiway A is a partial parallel (nearly full-length) taxiway serving Runway 3-21 via exit/entrance Taxiways A2, A3, A4, A5, A6 and A7. Runway 3-21 is also served by a separate entrance/exit taxiway, A1, which connects the aircraft parking apron to the Runway 21 threshold. The taxiway system is equipped with Medium Intensity Taxiway Lights (MITLs). The taxiway system is considered to be in fair condition according to the current UDOT Pavement Condition Index Survey. The results of the Pavement Condition Index survey are located in **Table 2-11**

2.13.3 Aircraft Apron Area and Heliport

The aircraft apron provides a defined area intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking or maintenance. Aprons are typically connected to the runway via taxiways. There is one aircraft parking apron at Canyonlands Field which serves commercial service and general aviation aircraft. The portion of apron dedicated to commercial service aircraft is located in the immediate vicinity of the passenger terminal and is approximately 475 square yards. This area is marked with a red line indicating a restricted area. Deicing operations occur on the commercial service apron after the aircraft has been relocated to a suitable distance from the passenger terminal building. There is no deicing material collection at Canyonlands Field.

The total size of the aircraft parking apron is approximately 34,400 square yards. There are 29 recessed tiedowns and one concrete hard stand available for based and transient aircraft on the aircraft parking apron. The commercial service and general aviation aprons are considered to be in fair to good condition according to the current UDOT Pavement Condition Index Survey. **Table 2-11** lists the existing apron data.

There are two heliports located adjacent to the aircraft parking apron. A heliport is designed as an area of land, water or structure used or intended to be used for the landing and takeoff of helicopters. The two heliports are 45 feet wide by 45 feet long and marked with standard heliport markings.

Table 2-11 Existing Pavement Data

Pavement	Pavement Type	PCI	Pavement Condition
Runway 3-21	Asphalt	61 to 79	Fair
Taxiway A	Asphalt	60 to 66	Fair
Commercial Service Apron	Asphalt	90	Good
General Aviation Apron	Concrete	100	Good
General Aviation Apron	Asphalt	58 to 89	Fair/Good
Heliport 1	Concrete	Not Evaluated	Fair
Heliport 2	Concrete	Not Evaluated	Fair

Source: UDOT, 2014

Figure 2-14 Aircraft Parking Apron

2.13.4 Airfield Lighting, Signage and Visual Aids

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Several common airfield lighting features include:

- Rotating Beacon – This visual aid is equipped with high intensity lamps mounted on an assembly which rotates 360 degrees every six seconds while emitting flashes of light. The designation for Canyonlands Field, a civilian land airport, is alternating green and white lights in equal duration. The beacon is activated by a photocell from dusk to dawn. If the beacon is activated during other hours it typically indicates that the airport is operating under instrument flight rules (IFR). The rotating beacon is located south of the aircraft parking apron and passenger terminal building.

- Wind Cone – This visual aid provides visual surface wind information to pilots. The primary wind cone is collocated with a segmented circle and located in the central portion of the airport. The segmented circle and lighted wind cone are co-located north of the Runway 21 threshold. A supplemental lighted wind cone is located approximately 600 feet from the Runway 3 threshold.

- Retroreflectors – This visual aid is used in lieu of taxiway lighting and consists of a single row bordering each side of the taxiway of reflective blue tape mounted on a pole. There are no retroreflectors at Canyonlands Field.

- Runway Edge Lights – This visual aid consist of a single row of white lights bordering each side of the runway and can be classified according to three intensity levels. High intensity runway lights (HIRL) are the brightest runway lights available. Medium intensity runway lights (MIRL) and low intensity runway lights (LIRL) are the lowest in intensity. The runway lights are typically activated from the aircraft cockpit by transmitting a series of "clicks" on the radio transmitter on the UNICOM (122.8 MHz). Instrument runways incorporate amber/white runway remaining lights on the last half of the runway or last 2,000 feet of runway, whichever distance is less. Runway 3-21 is equipped with MIRLs installed and the runway edge lights have white colored lenses (with amber/white lights on the last 2,000 feet).

Figure 2-15 Runway Edge Lights

- Runway End Identifier Lights – This visual aid consists of a pair of lights on each end of the runway threshold which flash in unison to provide identification of the approach end of the runway. This can be used to identify the runway surface from surrounding terrain or in poor visibility. Runways 3 and 21 are equipped with REILs. The Runway 3 REILs are owned and operated by the FAA. The Runway 21 REILs are owned and operated by Grand County.

- Taxiway Edge Lights – This visual aid consists of a single row of blue lights bordering each side of the taxiway. These lights mark the edge of the taxiways and guide aircraft from the runway to the ramp or apron area. Taxiway A and associated entrance/exit taxiways are equipped with MITLs. The MITLs are currently in poor condition and are slated to be replaced in 2015.

Figure 2-16 Threshold Lights

- Threshold Lights – This visual aid consists of a single row of green lights used to indicate the beginning of the usable landing surface. These lights are two-directional and appear red

from the opposite end of the runway to mark the end of the usable runway. Runways 3 and 21 are both equipped with eight threshold lights.

- Marking – This visual aid varies depending on whether the runway is used exclusively for visual flight rule operations (VFR) or instrument flight rule (IFR) operations. A visual runway is typically marked with the runway designator numbers and a dashed white centerline. A nonprecision instrument runway and its pavement markings include runway numbers (i.e., designators), centerlines, runway thresholds and aiming points. A precision instrument runway and its pavement markings include nonprecision instrument runway markings and the touchdown zone. Runway designators indicate the magnetic azimuth of the runway centerline. The runway centerlines provide alignment guidance during takeoff and landing. The runway threshold markings consist of twelve longitudinal stripes of uniform dimensions painted systematically along the runway centerline. The aiming point markings are located approximately 1,000 feet from the runway ends which serve as a visual aiming point for landing aircraft. Runway touchdown markings identify the touchdown zone for landing operations and are spaced to provide distance information in 500 foot increments. These markings consist of one, two or three rectangular bars systematically arranged in pairs on either side of the runway centerline. The total number of markings is based on the runway length.

  Runway 3-21 is marked with nonprecision instrument runway markings. The pavement markings are similar to those on precision runways, but do not include touchdown zone markings. The nonprecision markings on Runway 3-21 are in good condition as they were repainted in 2013.

  All taxiways at Canyonlands Field have visible taxiway centerline stripes with hold-short lines located at the required locations. These markings ensure that aircraft taxi along designated passageways for proper wingtip clearance and to advise of the areas protected for runway operations. Marking width is six to 12 inches as required by 14 Code of Federal Regulation (CFR) Part 139. Existing markings include enhanced markings applied to the extended runway holding position markings, taxiway centerline markings and surface painted hold signs. Enhanced taxiway centerline markings begin 150 feet prior to all holding position markings and consist of a yellow dashed line on either side of the taxiway centerline. These dashes are nine feet long with three foot gaps. Enhanced taxiway centerlines are only installed at holding positions where aircraft immediately enter a

Figure 2-17 Pavement Markings

runway. Surface painted holding position signs are required at all 14 CFR Part 139 airports with more than one runway. Surface painted holding position signs (SPHPS) are located both to the left and to the right of the taxiway centerline, however, if the taxiway centerline is less than 45 feet from the left and right edge of the taxiway, then the SPHPS on the right side may be omitted. If the taxiway width is 35 feet or less, the SPHPS can be centered on the taxiway which is the configuration at Canyonlands Field.

- Segmented Circle – This visual aid is located around the wind direction indicator. The segmented circle has two purposes: (1) identifying the location of the wind direction indicator and (2) identifying any non-standard traffic patterns. Canyonlands Field is equipped with a segmented circle. Canyonlands Field utilizes standard left-hand traffic patterns for Runway 3 and right-hand traffic for Runway 21.

- Signage – Airfield signage serves as a visual aid providing guidance for aircraft and vehicles on the airfield. Airfield signs include: mandatory instruction, location, direction, destination, information and runway distance remaining signs. Canyonlands Field is equipped with lighted runway entrance signs, runway hold position signs, taxiway and runway location, directional and destination signs, runway boundary signs, and runway distance remaining signs.

Figure 2-18 Taxiway Signage

- Precision Approach Path Indicator (PAPI) – This visual aid is located on the left side of the runway and consists of two or four lights installed in a single row. A PAPI provides visual approach path guidance by emitting a series of white and red lights. On a four light PAPI, three white lights denote the aircraft is above the glide path. Three red lights denote the aircraft as being below the glide path. A split two red lights and two white lights mean the aircraft is on the glide path. These lights have an effective visual range of five miles during the day and up to 20 miles at night. Four box PAPIs are installed on the approach end of Runways 3 and 21. The PAPIs at Canyonlands Field are owned and operated by Canyonlands Field.

- Approach Lighting System (ALS) – This visual aid is a lighting system installed at the approach end of a runway and consists of a series of lights that provide the pilot with transition from the aircraft instruments to the visual runway environment. For traditional ground-based NAVAID approaches (e.g., Very High Frequency Omni-Directional Range (VOR), ILS, NDB) an ALS is required for visibility minimums of less than 1-mile;

however, for GPS approaches with vertical guidance (e.g., LPV) they are only recommended, not required. Types of ALS include: Approach Lighting System with Sequenced Flashing Lights (ALSF), Simplified Short-Approach Light System with Sequenced Flashing Lights/Runway Alignment Indicator Lights (SSALF/SSALR), Medium-Intensity Approach Lighting System with Sequenced Flashing Flights/Runway Alignment Indicator Lights (MALSF/MALSR), Lead-in Light System (LDIN), Runway Alignment Indicator Lights (RAIL) and Omnidirectional Approach Lighting System (ODALS). Canyonlands Field is not equipped with any ALS.

2.13.5 Navigational Aids and Instrument Approaches

A Navigational Aid (NAVAID) is the primary means of enroute navigation and includes any ground based or satellite based electronic device used to provide course or altitude information to pilots. An instrument approach procedure is the use of a NAVAID to provide horizontal and/or vertical guidance to the runway during periods of inclement weather or night operations. NAVAIDs include Very High Frequency Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TAC), Nondirectional Beacons (NDBs), Tactical Air Navigational Aids (TACANs), Global Positioning System (GPS), and Instrument Landing Systems (ILS). Canyonlands Field has two published instrument approach procedures. There is also a published departure procedure which depicts a route to facilitate an efficient transition from the departure airport to the enroute route structure. **Figure 2-19** and **Figure 2-20** depict the published approach minima for the equipment below. Available NAVAIDs present at Canyonlands Field include:

- Global Positioning System (GPS) – GPS is a satellite-based navigation system comprised of ground stations and user receivers. An aircraft GPS receiver can track the position of the aircraft by calculating and comparing signal distance from several satellites. The system is reliable in all terrain and all weather conditions and is typically accurate within 100 feet. Runway 3 is equipped with nonprecision GPS approaches with minimums as low as 1-statue mile visibility and ceiling minimums of 900-feet (AGL).

- Very High Frequency Omni-Directional Range – This VOR operates by emitting a steady 360 degree signal, as well as producing a rotating signal which compares aircraft position information with a steady signal in order to transmit course information back to the aircraft. Its low altitude standard service volume has a range of 40 nautical miles (nm) between 1,000-feet and 18,000-feet MSL. The VOR is equipped with Distance Measuring Equipment (DME) which provides pilots with their distance to the VOR. The MOAB VOR is located on the airfield to the southwest of the aircraft parking apron. The VOR is used for nonprecision circling approaches to Canyonlands Field. The Airport is equipped with VOR circling approach minimums as low as 1 ¼ -statue mile visibility and ceiling minimums of 1,000-feet (AGL).

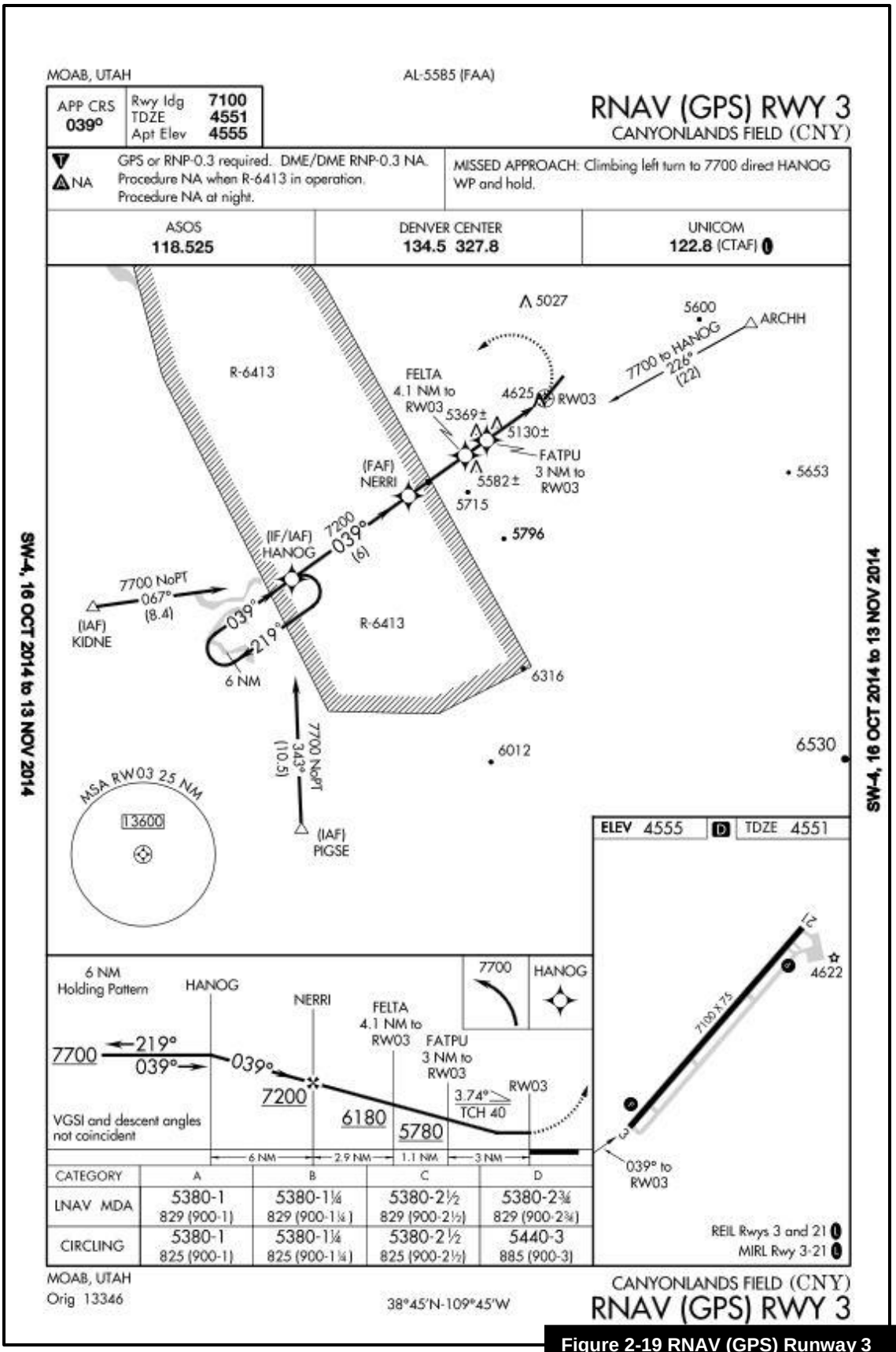


Figure 2-19 RNAV (GPS) Runway 3 Approach (Not for Navigational Use)

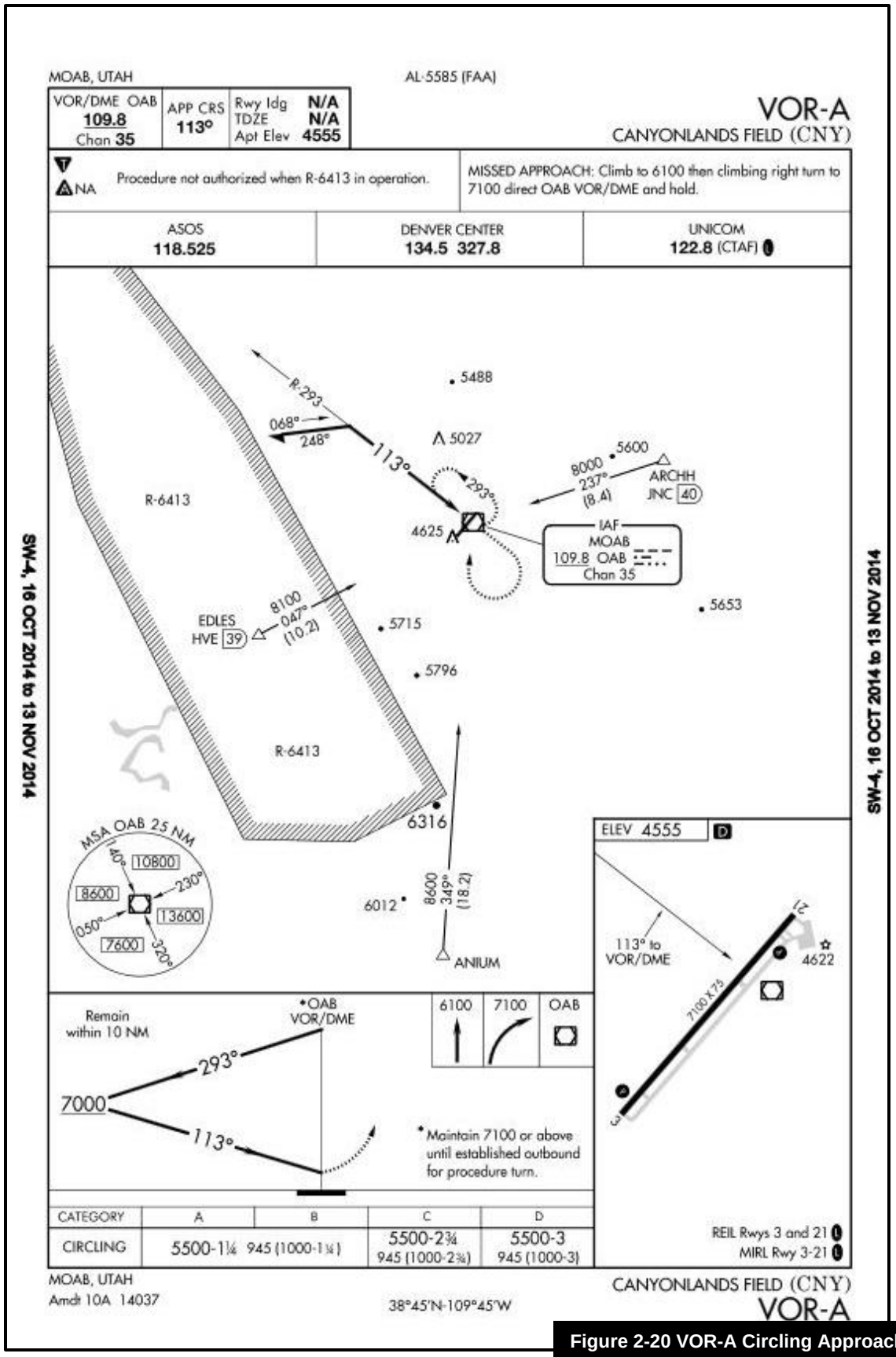


Figure 2-20 VOR-A Circling Approach (Not for Navigational Use)

2.13.6 Federal Aviation Administration Safety and Design Standards

FAA AC 150/5300-13A, *Airport Design*, establishes design standards for airports. When design standard deficiencies exist, the FAA recommends correction of such deficiencies as soon as practicable.

2.13.6.1 Airport Design Standards

The Airport Reference Code (ARC) is a coding system established by the FAA and used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC is established from the highest Runway Design Code (RDC) for the airport. The RDC has three components relating to the airport design aircraft. The existing design standards for Canyonlands Field are listed in **Table 2-15**.

The first component, depicted by a letter (e.g. A, B, C, D, or E), is the Aircraft Approach Category (AAC) and relates to the aircraft approach speed based upon operational characteristics. An aircraft fits into a category based on 1.3 times the stall speed of that aircraft at maximum gross weight in the landing configuration.

The second component of the ARC is the Aircraft Design Group (ADG) and is depicted by a Roman numeral (e.g. I, II, III, IV V or VI). The aircraft design group is based on an aircraft's physical characteristics (wingspan or tail height, whichever is most demanding).

The third component relates to the visibility minimum expressed by RVR values in feet of 1,200, 1,600, 2,400, 4,000 and 5,000 (corresponding to lower than ¼-mile, lower than ½-mile but not lower than ¼-mile, lower than ¾-mile but not lower than ½-mile, lower than 1-mile but not lower than ¾-mile and not lower than 1-mile respectively). For a runway which only has visual approaches the identifier is VIS.

Tables 2-12, 2-13 and 2-14 provide a breakdown of AAC, ADG and RVR.

Table 2-12 Aircraft Approach Category (AAC)

Aircraft Approach Category	Approach Speed
A	<91 knots
B	>91 knots but <121 knots
C	>121 knots but <141 knots
D	>141 knots but <166 knots
E	166 knots or greater

Source: FAA AC 150/5300-13A *Airport Design*

Table 2-13 Airplane Design Group (ADG)

Group #	Wingspan (Ft.)	Tail Height (Ft.)
I	< 49'	< 20'
II	49' - < 79'	20' - < 30'
III	79' - < 118'	30' - < 45'
IV	118' - < 171'	45' - < 60'
V	171' - < 214'	60' - < 66'
VI	214' - < 262'	66' - < 80'

Source: FAA AC 150/5300-13A *Airport Design*

Table 2-14 Visibility Minimums

RVR (FT)	Flight Visibility Category (Statue Mile)
VIS	Visual
5,000	Not lower than 1 mile (NPA > 2 miles)
4,000	Lower than 1 mile but not lower than 3/4 mile (APV ≥ 3/4 but < 1 mile)
2,400	Lower than 3/4 mile but not lower than 1/2 (CAT - I PA)
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)
1,200	Lower than 1/4 mile (CAT - III PA)

Source: FAA AC 15/3500-13A *Airport Design*

The RDC and ARC at Canyonlands Field is B-II for Runway 3-21 with visibility minimums of 5,000 feet.

The Taxiway Design Group (TDG) is a numeric system which relates to the operational and physical characteristics of the aircraft intended to operate at the airport's taxiways. The TDG is determined by the length from the cockpit to main gear and main gear width in feet. The existing design standards for the taxiway system at Canyonlands Field are listed in **Table 2-15**.

2.13.6.2 Safety Areas

FAA AC 150/5300-13A, *Airport Design*, defines a Runway Safety Area (RSA) as "an identified surface surrounding the runway prepared and suitable for reducing risk of damage to airplanes in the event of an overshoot, undershoot or excursion from the runway." The RSA has dimensional requirements as well as clearing, grading and drainage requirements.

The dimensional requirements for an RSA (and a subsequent Taxiway Safety Area) reflect the aircraft types utilizing the runway. As defined in FAA AC 150/5300-13A, *Airport Design*, both the ADG (defined by the aircraft's wingspan) and the AAC (defined by an aircraft approach speed) are the basis for establishing the RSA dimensions.

The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations.
- Drained so as to prevent water accumulation.

- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment and the occasional passage of aircraft without causing structural damage to the aircraft.

- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function; and

- Installation of storm sewers is permissible within the RSA, but elevation of the storm water inlets may not vary more than three inches from surface elevation.

The RSAs surrounding Runway 3-21 at Canyonlands Field meet dimensional standards and are clear of obstructions and in good condition.

2.13.6.3 Obstacle Free Zone and Object Free Area

The Obstacle Free Zone (OFZ) is a three dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual Navigational Aids (NAVAIDs) that need to be located in the OFZ because of their function. The OFZ is similar to the 14 CFR Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway and it extends 200 feet beyond the end of each runway. The Runway Object Free Area (ROFA) is a two-dimensional ground area surrounding the runway. The ROFA standard precludes parked airplanes, agricultural operations and objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. Both the OFZ and OFA at Canyonlands Field meets the requirements defined within FAA AC 150/5300-13A, *Airport Design*.

2.13.6.4 Runway Protection Zone (RPZ)

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end.

At the end of Runway 3-21, the RPZs begin 200 feet from the runway. The RPZs for Runway 3-21 are 500 feet wide at the inner end and 700 feet wide at the outer end and extend 1,000 feet.

The land uses not recommended within the RPZ are residences and places of public assembly (e.g., churches, schools, hospitals, parking lots, office buildings, shopping centers and other uses with similar concentrations of persons typify places of public assembly). The FAA recommends that airport’s control RPZs through fee simple ownership or avigation easements.

The approach and departure RPZs for Runway 3-21 begin at 200 feet from the pavement edge and are located on existing Airport property.

Table 2-15 Current Airfield Design Standards

Runway	**3-21**
Runway Design Code	B-II-5000
Approach Visibility Minimums	1 SM
RW Length	7,100’
RW Width	75’
RW Safety Area width	150’
RW Safety Area length beyond runway end	300’
RW Object Free Area width	500’
RW Object Free Area length beyond runway end	300’
Obstacle Free Zone width	400’
Obstacle Free Zone length beyond runway end	200’
Runway Protection Zone	500’ x 1,000’ x 700’
RW Centerline to taxiway/taxilane centerline	240’ (300’ Actual)
RW Centerline to aircraft parking area	250’ (380’ Actual)
Taxiway Design Group	**2**
TW Width	35’
TW Safety Free Area width	79’
TW Object Free Area width	131’
TW Centerline to Parallel TL Centerline	105’
TL Object Free Area width	115’

Source: FAA AC 150/5300-13A *Airport Design*

2.13.7 Title 14 Code of Federal Regulation (CFR) Part 77

Title 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation activity. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in 14 CFR Part 77 are applied to each runway. These surfaces are shown in **Figure 2-21**. The FAA defines runway types as the following:

- Visual/utility runway – a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight or less.

- Nonprecision instrument/utility runway – a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority.

- Nonprecision instrument/larger-than-utility runway – is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

- Precision Instrument – is a runway having an existing instrument approach procedure utilizing an ILS or a Precision Approach Radar (PAR).

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums.

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface slope is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the 14 CFR Part 77 runway classification criteria.

The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

The Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

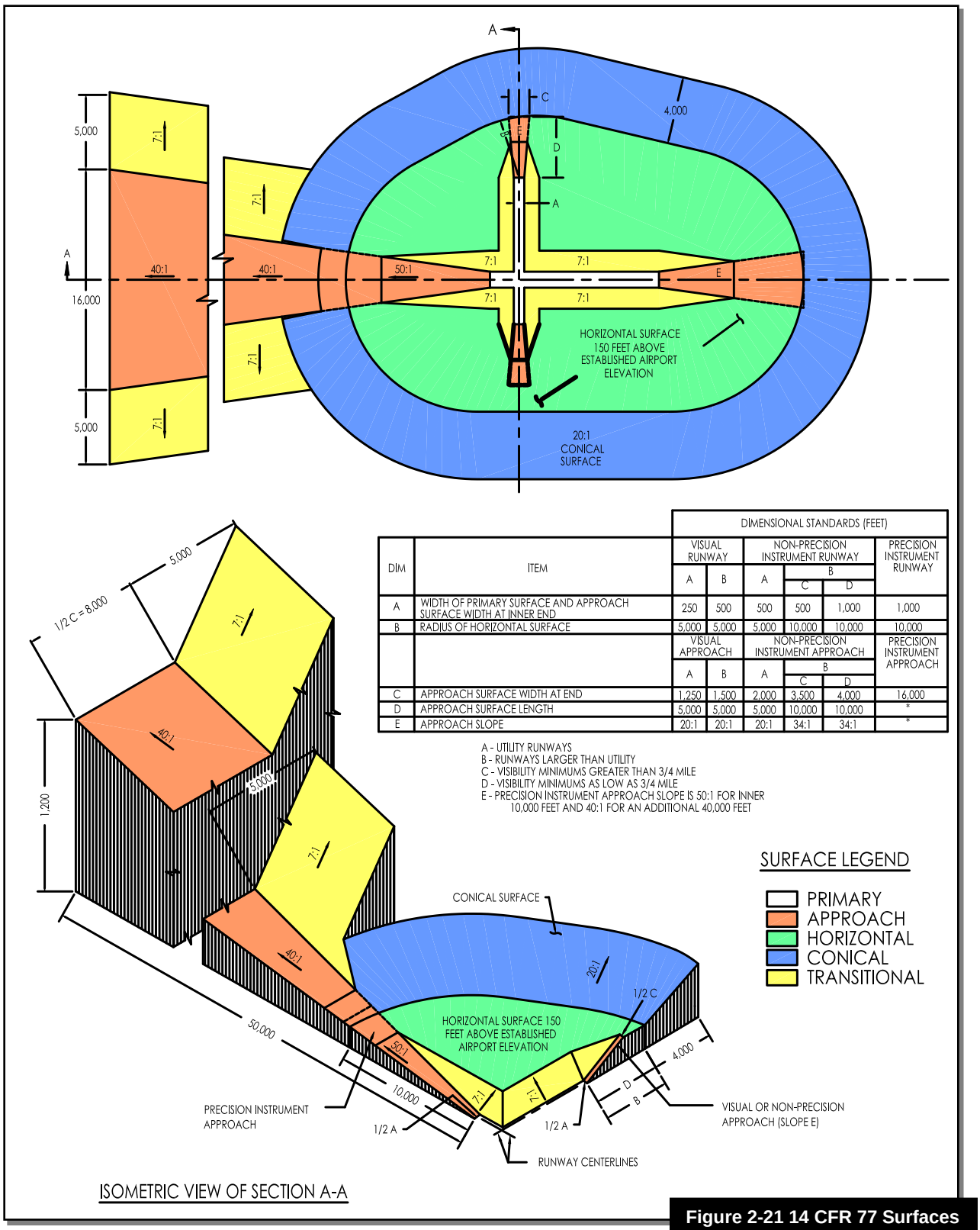
The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

The Part 77 surfaces for Canyonlands Field are listed in **Table 2-16.**

Table 2-16 Part 77 Surfaces – Runway 3-21

	Runway 3-21
Runway 3	Nonprecision – Larger Than Utility > 1 Mile
Runway 21	Visual – Larger Than Utility
Primary Surface Width	500'
Primary Surface beyond RW end	200'
Approach Surface dimensions	RW 3: 500' x 3,500' x 10,000' RW 21: 500' x 1,500' x 5,000'
Approach Surface slope	RW 3: 34:1 RW 21: 20:1
Transitional Surface slope	7:1

Source: 14 CFR Part 77



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Figure 2-21 14 CFR 77 Surfaces

Source: 14 CFR Part 77, 2014

2.14 Existing Landside Facilities

The landside facilities of an airport consist of those facilities that are not included as airside characteristics. Examples of such landside facilities include any structure adjoining the airfield, terminal buildings, hangars, the access routes to and from the airport, automobile parking areas, airport fencing, utilities, fuel provisions and snow removal and maintenance equipment. The Canyonlands Field existing landside facilities are shown in **Figure 2-22**.

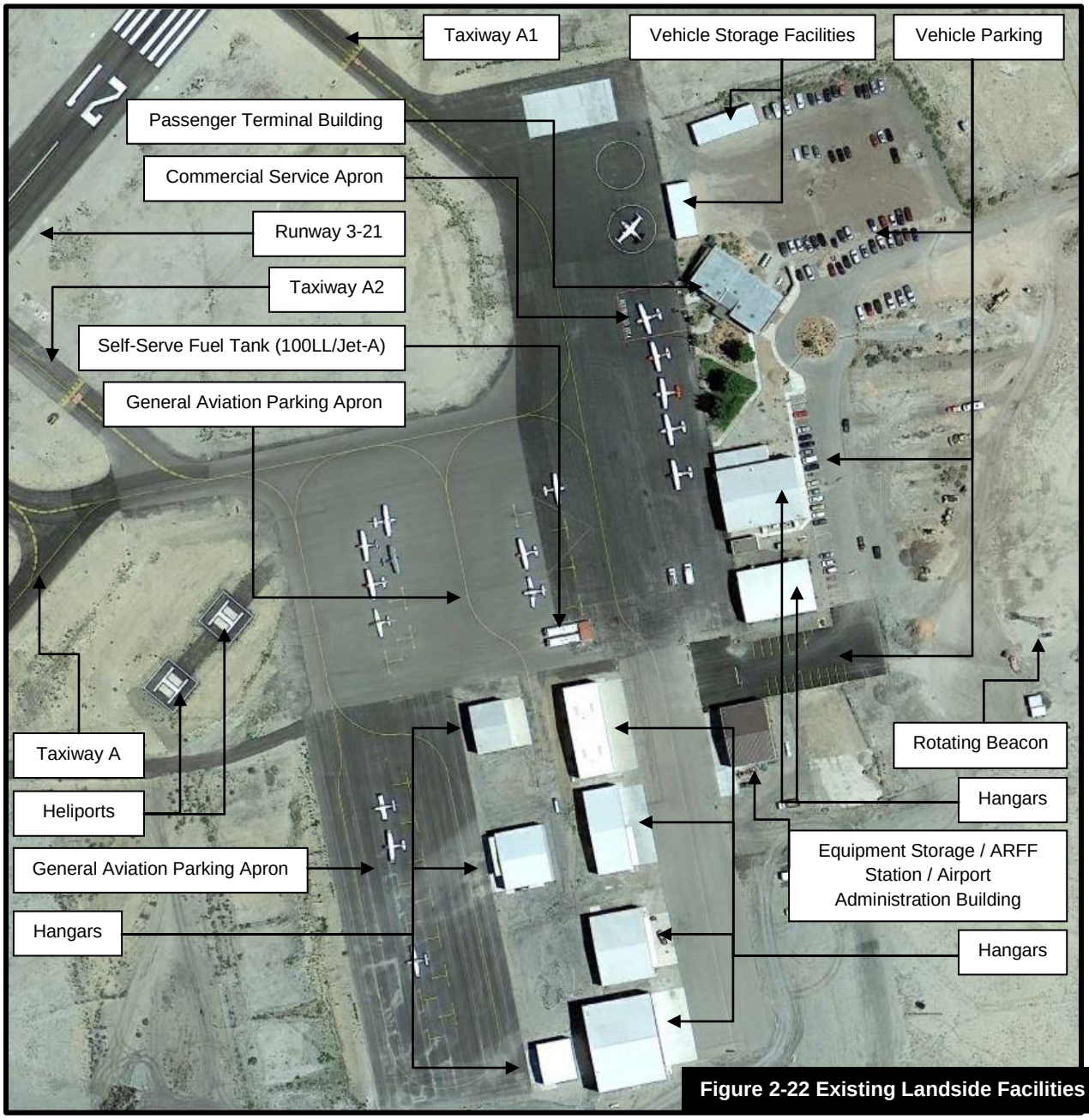


Figure 2-22 Existing Landside Facilities

2.14.1 Passenger Terminal Building

Airport passenger terminal buildings are used to transfer passengers between aircraft and ground transportation and provide facilities for passengers enplaning and deplaning aircraft. The terminal building houses ticket counters for airlines serving the airport, including space for issuing tickets, transferring checked baggage, security screening of checked bags, area for the Transportation Security Administration (TSA) personnel to screen passengers and sterile waiting area for passengers that have been processed through the security checkpoint. Terminal buildings also have gates to provide passengers access to and from the aircraft. The number of gates varies depending on the volume of airline traffic utilizing the airport. Terminal buildings also provide baggage claim areas which usually include baggage carousels for passengers to retrieve checked baggage upon arrival at the airport. The terminal building is typically utilized by airport management for office space and by airport tenants including rental car companies, restaurants and gift shops.

The size of these different areas varies depending on the amount of traffic the facility receives. Large commercial service airports have several concourses which may be connected by walkways, sky-bridges or underground tunnels. Concourses can be set up to accommodate one or two specific airlines depending on the size. Smaller commercial service airports typically share one satellite concourse with gates. Smaller regional aircraft may be accessed through either a jet-bridge or through ground loading.

Canyonlands Field has a single-story, 4,500 square foot terminal building. The most recent renovation occurred in 2013, where the original passenger terminal building was completely renovated. The passenger terminal building is shown in **Figure 2-23**. The layout of the passenger terminal building is shown in **Figure 2-24**.

Figure 2-23 Passenger Terminal Building

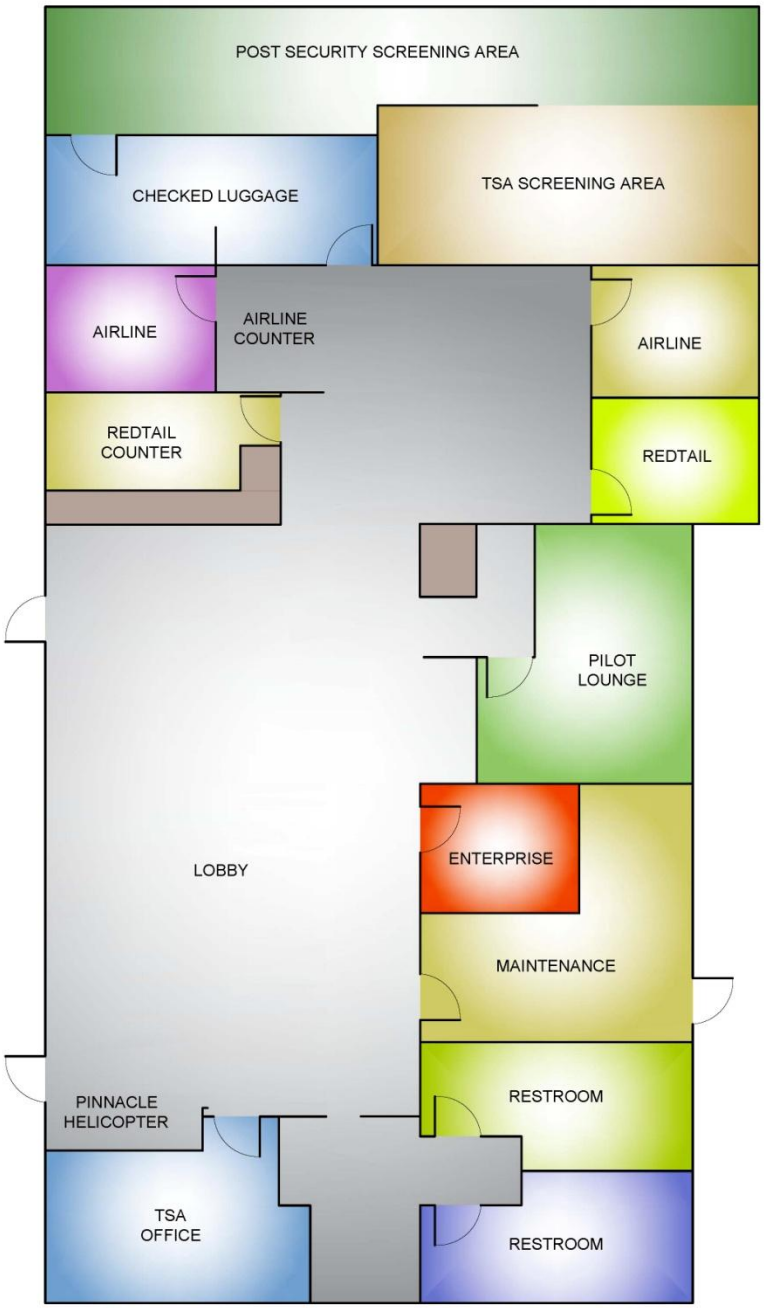


Figure 2-24 Passenger Terminal Building Floor Plan

2.14.2 Airline Ticket Counters and Offices

There are two airline ticket counters with office space and baggage processing areas located in the passenger terminal building. Passengers are able to obtain boarding passes, check-in luggage for their flight or obtain customer services at these locations. The remaining counter and office space in the terminal building is used for TSA baggage screening. All outgoing luggage receives security screening and evaluation in the TSA's designated area.

Figure 2-25 Airline Ticket Counter

2.14.3 Security Screening Area

The passenger screening area is located in the central portion of the passenger terminal building adjacent to the main entry doors. The TSA owns and operates aviation security equipment such as a metal detector and X-ray to detect any foreign devices which can pose harm to other passengers, flight crew or the general population. A secondary screening room is available to provide the TSA a secure location to conduct further investigation.

2.14.4 Passenger Boarding Gate

A passenger lounge is located in the western portion of the passenger terminal building and can only be accessed after completing TSA screening. There is one passenger boarding gate, which directly connects the passenger lounge to a designated path on the commercial service apron to the parked aircraft. Incumbent airlines lease and operate the passenger boarding gate. Airline passengers access their aircraft via a ramp connected by ground personnel to the aircraft. Redtail Aviation does not require security screening for their passengers and ground personnel escort passengers to their aircraft via gate access.

2.14.5 Greeter's Lobby

There is a greeter's lobby located in the passenger terminal building. The area consists of chairs, vending facilities and local tourism information. This area serves as a non-sterile waiting area for departing passengers.

Figure 2-26 Terminal Building Lobby

2.14.6 Rental Car Services

There are two rental car counters located in the passenger terminal building. Enterprise Rent-A-Car and Canyonlands Car Rentals utilize one counter each. The rental car services are available to Canyonlands Field passengers, general aviation users and the general public. Customers are able to check-in for car rentals and obtain customer services at these locations. The rental cars are obtained and returned to the designated parking lots on the east side of the passenger terminal building.

Figure 2-27 Rental Car Desk

2.14.7 Curb Side

Passengers departing or arriving from Canyonlands Field who are utilizing taxi, limousine, hotel shuttle or private automobiles use the curbside staging area located along the northern portion of the passenger terminal building. This area allows passengers to be dropped off or picked up at a fast rate without requiring the vehicle to use the parking lot. The curbside access point can be reached via a two-way road connecting to U.S. Highway 191.

2.14.8 Miscellaneous Services and Facilities

The passenger terminal building also serves two other airport businesses, Redtail Aviation and Pinnacle Helicopters. Additionally, a pilot lounge with a kitchenette, courtesy phone and Data Transmission Network (DTN) weather station is available for based and transient pilots operating to and from Canyonlands Field.

2.14.9 Airport Services/Fixed Based Operators

A Fixed Base Operator (FBO) is typically a private enterprise that leases land from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services provided varies from airport to airport; however, these services frequently include: aircraft fueling; maintenance and repair; aircraft rental and/or charter services; flight instruction; pilot lounge and flight planning facilities; and, aircraft tie down and/or hangar storage. A Specialized Aviation Service Operator (SASO) is a private enterprise which does not provide full FBO services, but focuses on an area of specialty for based and transient aircraft (i.e. maintenance, aircraft charter or aircraft refueling).

Redtail Aviation is the FBO at Canyonlands Field. They lease from the county the airport ramp space for aircraft parking and fueling, two hangars for maintenance and aircraft storage and office space in the main terminal building.

Redtail Aviation is located in the passenger terminal building and provides a range of services including: full service Jet-A and Avgas 100 low lead (LL) fuel, on-site certificated aircraft airframe and power-plant maintenance technicians, flight training, aircraft rental, scenic air tours, passenger charters and hangar storage.

2.14.10 Airport Maintenance and Equipment

Airport maintenance is conducted under the authority of the Airport Manager. The airport owns and operates several pieces of maintenance equipment including: snow removal equipment vehicles and various maintenance support trucks. The current inventory of support vehicles includes:

Figure 2-28 Ford Taurus Sedan

- One 10-foot snow plow attachment
- One 8-foot snow plow attachment
- One 4-foot snow plow attachment
- One dump truck with 12-foot snow plow attachment
- Two Ford F250 pick-ups
- Two Ford sedans (**Figure 2-28**)
- One all-terrain vehicle
- One tractor with front loader

Airport management maintains an active snow and ice control plan. The maintenance equipment is stored in the ARFF station located adjacent to the northeast portion of the aircraft parking apron.

Figure 2-29 Hangars at Canyonlands Field

2.14.11 Hangars

Hangars are typically classified as either T-hangars (small multi-unit storage complexes that usually accommodate one single engine aircraft

in each unit) or conventional box hangars, which range from small to very large accommodating a variety of aircraft types or corporate fleets. The existing aircraft hangars consist of 11 conventional hangars. The existing hangars are either owned by private organizations, individuals or the airport. **Figure 2-29** shows examples of hangars located at Canyonlands Field.

2.14.12 Utilities

Available utilities at Canyonlands Field include power, water, sewer, gas, phone and internet. The electricity is provided by Rocky Mountain Power and natural gas is provided by Questar Gas. Telephone and internet services are provided by Emory Telecom. All facilities utilize on-site wells for water, septic systems and on-site waste water ponds.

2.14.13 Access Routes, Signage and Automobile Parking

Canyonlands Field is located approximately 18 miles north of downtown Moab and can be reached by following U.S. Highway 191 north from downtown Moab, to Aviation Way. Aviation Way provides public and non-public access and is the main circulation roadway to the Airport. There is signage available on U.S. Highway 191 to incoming direct traffic to the airport. The passenger terminal building and general aviation ramp are accessed via Aviation Way.

Figure 2-30 Passenger Terminal Building Parking

The parking lot is adjacent to the terminal building to the east and south with 31 paved parking spaces, of which: one is designated handicapped, two are designated “passenger-drop off”, five are “designated employee only” and seven are designated “one hour only”. There is additional unpaved parking located north and east of the passenger terminal building. The airport also has three parking garages with four 10 foot long by eight foot wide stalls in each building. These are rented on monthly leases to those who wish to store their vehicle at the airport for long durations and ensure protection from weather and outdoor conditions. Automobile parking is provided prior to reaching the terminal building on Aviation Way and is free to airport users.

2.14.14 Intermodal Transportation

The ground transportation network within the City of Moab consists of private automobile transportation, charter buses, hotel courtesy transportation, and taxi and limo service. There is

no passenger rail service to Moab. The nearest rail service is located 36 miles north in Green River, Utah. The City of Moab has two daily scheduled shuttles to Salt Lake City provided by Moab Luxury Coach. U.S. Highway 191 runs north-south of Moab intersecting with Interstate 70 approximately 13 miles north of Canyonlands Field.

2.14.15 Aircraft Fuel Facilities

A FBO or the airport sponsor typically provides aircraft fuel services. Combinations of 100 low lead (LL) and/or Jet-A fuel are usually provided depending on the aircraft traffic mix.

Redtail Aviation provides fuel service at Canyonlands Field. Redtail Aviation has one 12,000 gallon above ground Jet-A storage tank and one 12,000 gallon above ground 100LL storage tank. All tanks are single wall within containment areas. Redtail also operates a Jet-A dispensing fuel truck and a 100LL dispensing fuel truck. The fuel available at Redtail Aviation is full service and self-serve.

2.14.16 Security

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals on to airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the property and outside any of the safety areas defined by the Federal Aviation Administration (FAA) in Advisory Circular (AC) 150/5300-13A, *Airport Design* and 14 Code of Federal Regulation (CFR) Part 77*, Objects Affecting Navigable Airspace.*

The Airport is entirely fenced with a five strand barbed wire perimeter fence with an additional mesh guard along the bottom half. The terminal area is also surrounded by an eight foot chain-link fence. There are also controlled access points to the airport. These access points are a variety of pedestrian gates, doors, and manual or automatic vehicle gates. Each access point is controlled by key pads, padlock or cipher lock.

The Sheriff's Department is not located on Airport property, but responds as needed. Canyonlands Field is under contract with the Grand County Sherriff's Department for one deputy to be located at the airport during commercial air service operations. The TSA provides baggage and passenger screening for all scheduled air carrier flights operating at Canyonlands Field.

2.14.17 Emergency Services

Operators of Part 139 airports are required to provide aircraft rescue and fire fighting (ARFF) services during air carrier operations that require a Part 139 certificate. Canyonlands Field is classified as a Class III FAR Part 139 Airport which means the Airport is certificated to serve scheduled operations of small air carrier aircraft (e.g. 10-30 passenger seats). As a result of

being classified as a Class III airport certain criteria must be met by the Airport including providing a certain level of emergency response.

FAR Part 139 also establishes the level of aircraft rescue and fire fighting (ARFF) equipment and agents required for an airport. The ARFF Index level required is determined by the longest passenger aircraft with an average of five daily departures serving the airport as follows:

- Index A – Aircraft less than 90 ft in length;
- Index B – Aircraft at least 90 ft but less than 126 ft;
- Index C – Aircraft at least 126 ft but less than 159 ft;
- Index D – Aircraft at least 159 ft but less than 200 ft; and
- Index E – Aircraft greater than 200 ft in length.

Figure 2-31 ARFF Station

Canyonlands Field is currently classified as an Index A airport.

The ARFF station is located on the Airport and provides fire fighting and rescue services for aircraft, buildings located on the Airport (main terminal, storage hangars), parking areas, and the fuel farm with a three minute response time to any area of the Airport. Ambulance services are also provided by Grand County. The ARFF building provides two vehicle storage bays. The ARFF building was constructed in 2011, is 52 feet wide by 68 feet deep by 20 feet tall and located south of the Airport terminal. The ARFF station has three bay doors which open to the airside. There is one ARFF truck, an Oshkosh Striker 1500 (Vehicle #1) manufactured in 2011 which meets Index B requirements. It has the ability to contain 1,500 gallons of water, 200 gallons of foam or 500 pounds of dry chem. The ARFF vehicles and equipment are in excellent condition and owned by Grand County. The ARFF station is depicted in **Figure 2-31**.

There is one firefighter based at the Airport fire station 15 minutes prior and 15 minutes after the arrival and departure of all scheduled air carrier flights. The nearest ambulance is provided by the Grand County Emergency Medical Service.

There is one hospital located in Moab: Moab Regional Hospital. Moab Regional Hospital has 17 licensed beds and is open 24-hours a day. **Table 2-17** depicts all rescue services available for Canyonlands Field.

Figure 2-32 ARFF Truck with ARFF Personnel

Table 2-17 Canyonlands Field Rescue Data

Equipment/Facilities/Etc.	Operational Data
Personnel	One firefighter per shift
Oshkosh Striker 1500	1,500 gallons of water, 200 gallons of foam and 500 pounds of dry chem. For airport use only
Moab Regional Hospital	17 beds

2.14.18 Weather Reporting Services

The weather reporting system at Canyonlands Field includes an Automated Surface Observing System (ASOS). The ASOS program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). The ASOS serve as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological and climatological research communities. The ASOS is connected to the National Airspace Data Interchange Network (NADIN) which disseminates weather conditions to pilots through various aviation weather websites including the FAA Terminal Aerodrome forecast. The ASOS is owned and operated by the National Oceanic and

Atmospheric Administration and is located approximately 600 feet northeast of the Runway 3 threshold. The ASOS may be reached via radio at 118.525 MHz or by dialing (435) 259-8576.

2.14.19 Summary of Existing Airport Facilities

Table 2-18 lists the existing airside and landside facilities available at Canyonlands Field.

Table 2-18 Existing Airport Facilities Summary

Facility Information	
Identifier	CNY
FAA Site Number	25205.1*A
NPIAS Number	49-0020
Owner/Sponsor	Grand County
Airport Elevation	4,557-feet Mean Sea Level
Runway and Taxiway Data	
Runway 3-21	Length: 7,100' Width: 75' Surface: Asphalt - PFC Marking: Non-Precision Lighting: MIRLs Pavement Strength: 25,000 lbs. SWG
Visual Aids	PAPIs, REILs
Approach Minimums	1-mile
Taxiways	A, A1, A2, A3, A4, A5, A6 and A7
Taxiway Lighting	MITL
Aircraft Apron	34,400 square yards
Tie Downs	29
Navigational Aids	
Air Navigation Aids	VOR, GPS
Airport Beacon	Clear-Green (Civil Airport)
Wind Indicator	Lighted
Segmented Circle	Yes
Unicom	122.80 MHz
Airport Building and Services	
Hangars	11 Conventional
Passenger Terminal Building	4,500 Square Feet
Automobile Parking	31 Paved
Perimeter Fencing	4 strand barbed wire perimeter fence/7-foot terminal area fence
Fuel	100LL & Jet-A
Services	Car rental, taxi, wireless internet, airframe repairs, maintenance, deicing, flight instruction, restrooms, aircraft rental, charter and pilot lounge.
Weather Equipment	ASOS
FBO	Redtail Aviation
Utilities	Electrical, natural gas, water and sewer, telephone and internet

2.15 Airspace

2.15.1 National Airspace System

The National Airspace System consists of various classifications of airspace that are regulated by the FAA and is considered controlled or uncontrolled airspace. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) regulations and must follow either Visual Flight Rule (VFR) or Instrument Flight Rule (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment and pilot certification and vary depending on the Class of airspace and are described in Federal Aviation Regulations (FAR) Part 71, Class designations; Airways; Routes; and Reporting Points and FAR Part 91, General Operating and Flight Rules.

General definitions of the Classes of airspace are provided below and depicted in **Figure 2-33**:

- Class A Airspace – Airspace from 18,000 feet Mean Sea Level (MSL) up to and including Flight Level (FL) 600.

- Class B Airspace – Airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements.

- Class C Airspace – Generally airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control and that have a certain number of IFR operations or passenger enplanements. The airspace usually consists of a 5 nautical mile (nm) radius core surface area that extends from the surface up to 1,200 feet above the airport elevation and a 10 nm radius shelf area that extends from 1,200 feet up to 4,000 feet above the airport elevation.

- Class D Airspace – Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.

- Class E Airspace – Generally controlled airspace that is not Class A, Class B, Class C or Class D.

- Class G Airspace – Generally uncontrolled airspace that is not designated Class A, Class B, Class C, Class D or Class E.

- Victor Airways – These airways are low altitude flight paths between ground based VHF Omnidirectional Receivers (VORs).

Figure 2-34 illustrates that the airspace surrounding Canyonlands Field is Class G from the ground to 700-feet AGL. At 700 feet above the airport surface, the airspace classification

changes to Class E airspace which requires pilots to comply with more restrictive weather requirements and certain air traffic control procedures for IFR operations.

The traffic patterns to Canyonlands Field are standard left hand traffic for Runway 3 and right hand traffic for Runway 21. The published traffic pattern altitude (TPA) is 1,560 feet above ground level (AGL) for heavy and turbine powered aircraft, 1,060 feet AGL for all aircraft. Airspace and future land use planning are further discussed in Chapter Four, *Facility Requirements*.

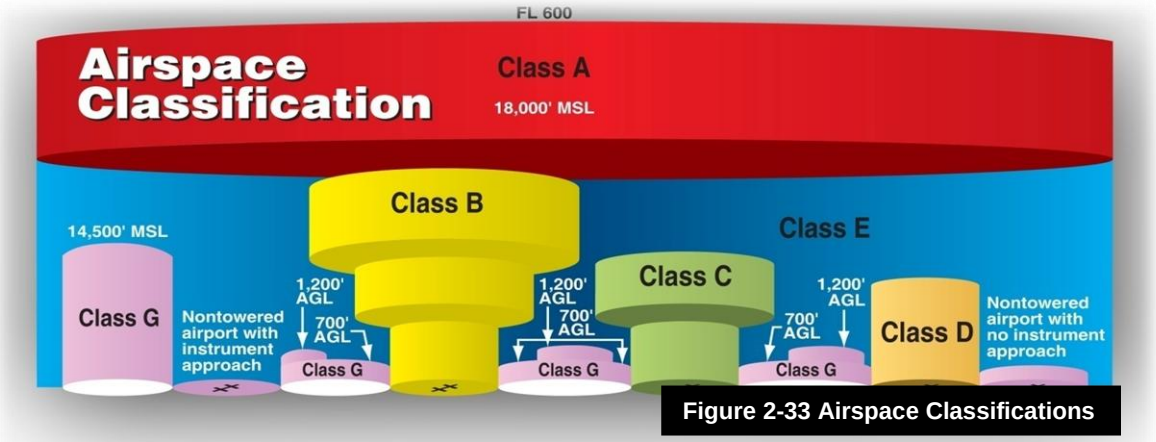


Figure 2-33 Airspace Classifications

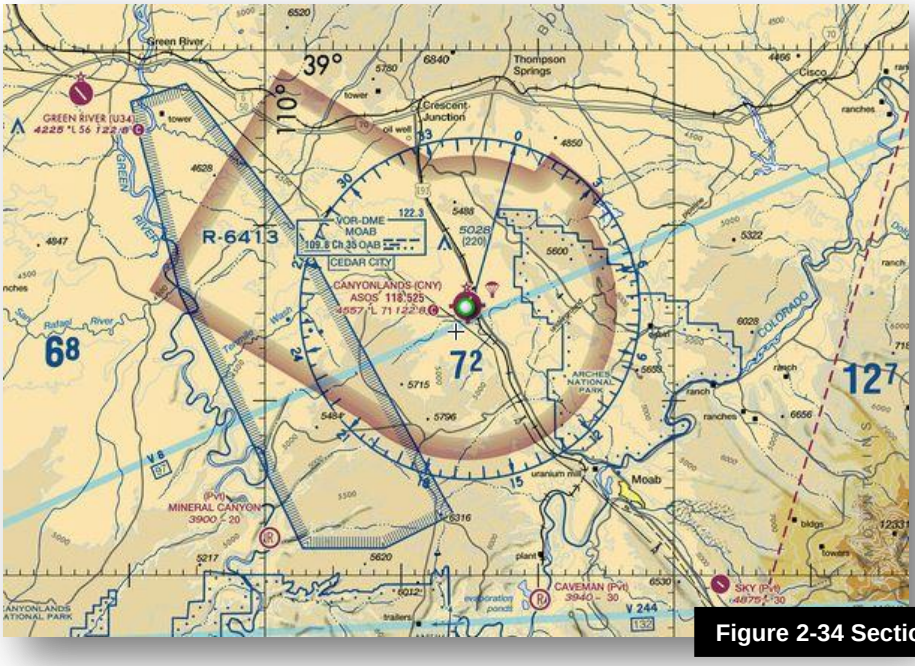


Figure 2-34 Sectional Map

2.15.2 Airspace Jurisdiction

Canyonlands Field is located within the jurisdiction of the Denver Route Control Center (ARTCC) and the Cedar City Flight Service Station (FSS). As Canyonlands Field has no air traffic control tower, the airport is considered to be uncontrolled and pilots are requested to announce their position in relation to the airfield to ensure traffic avoidance. The altitude of radar coverage by the Denver ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions and surrounding terrain. The Cedar City FSS provides additional weather data and other pertinent information to pilots on the ground and enroute.

2.15.3 Airspace Restrictions

Military Operations Areas (MOAs) consist of airspace with defined vertical and lateral limits established for the purpose of separating certain military training activities from general IFR traffic which separate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. Restricted airspace is similar to a MOA but typically includes activities which would be hazardous to aviation operations such as missile testing or artillery shelling. Prohibited airspace is an area which no civilian aviation operations may occur within due to protection of national security interests.

Whenever an MOA is being used, nonparticipating IFR traffic may be cleared through an MOA if IFR separation can be provided by Air Traffic Control (ATC). Otherwise, ATC reroutes or restricts nonparticipating IFR traffic. MOAs, Restricted and Prohibited airspaces are depicted on sectional, VFR terminal area, and en route low altitude charts. These are also further defined on the back of the sectional charts with times of operation, altitudes affected, and the controlling agency. R-6413 Restricted airspace is located approximately eight miles west of Canyonlands Field and includes an unlimited ceiling. R-6413 is active at various unspecified times and is activated via NOTAM. R-6413 is controlled by Denver Center.

2.16 Climate and Meteorological Conditions

Meteorological conditions play an important role in the planning and development of an airport. Wind direction and speed are essential in determining optimum runway orientation. Temperatures substantially affect aircraft performance and are a major factor in runway length determination. The percentage of time an airport experiences low visibility due to meteorological conditions is a key factor in determining the need for instrument approach procedures and the type of procedure and facilities needed. The type of instrument approach procedure that might be needed, in turn, determines airspace and imaginary surface requirements. The amount and type of precipitation that occurs at an airport affects visibility and runway friction, or runway braking effectiveness. It also affects the type of maintenance equipment required (e.g., snow and ice removal equipment).

2.16.1 Local Climatological Data

Moab experiences a four-season climate generally experiencing hot, dry weather in the summer and cooler temperatures in the winter. The fall and spring season provide a good transition between the two extremes. Moab receives approximately nine inches of precipitation annually. Average annual snowfall for Moab is 10 inches. The average maximum temperature of the hottest month is 98.2 degrees Fahrenheit in July, while the average minimum temperature of the coldest month is 18.2 degrees Fahrenheit in January. The annual average maximum temperature is 71.4 degrees Fahrenheit and the annual average minimum temperature is 41.8 degrees Fahrenheit. **Figure 2-35** shows the average annual precipitation for the State of Utah which shows that Moab is located within the dry portion of the state.

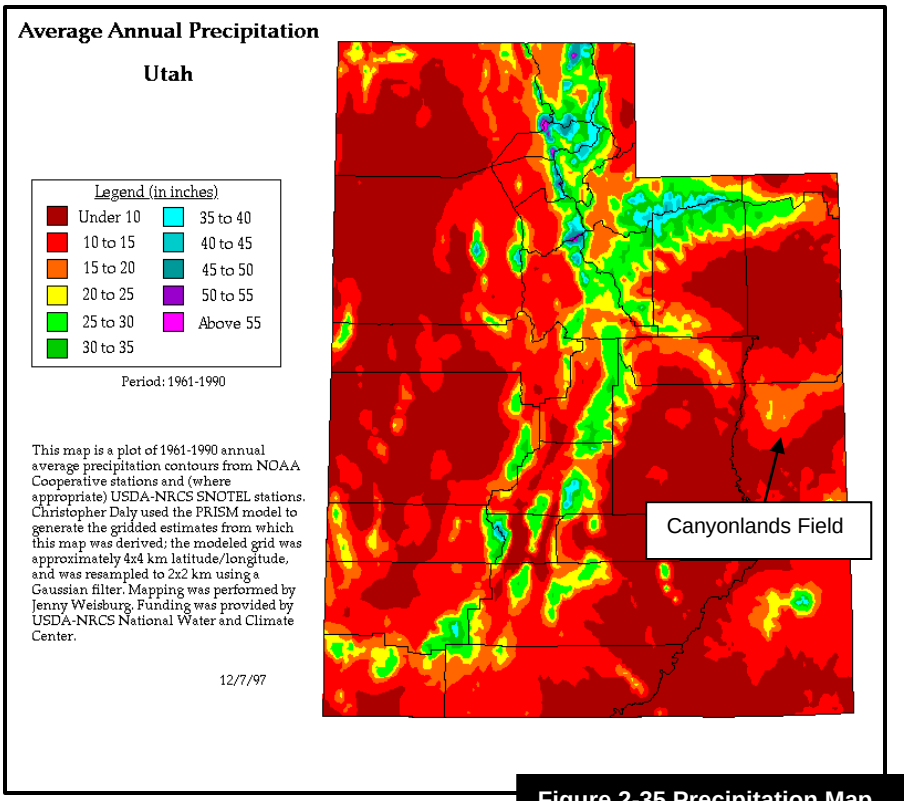


Figure 2-35 Precipitation Map

2.16.2 Ceiling and Visibility Conditions

Ceiling and visibility conditions are important considerations since the occurrence of low ceiling and/or poor visibility conditions limit the use of an airport. Under poor visibility conditions or Instrument Meteorological Conditions (IMC), the pilot must operate under Instrument Flight Rules (IFR), rather than Visual Flight Rules (VFR). Under IFR, the pilot maneuvers the aircraft through sole reference to instruments in the aircraft and navigational aids on the ground. When flight conditions are visual or Visual Meteorological Conditions (VMC), the pilot can maneuver the aircraft by reference to the horizon and objects on the ground. On average, there are 121 cloudy days per year in Moab.

2.16.3 Wind Conditions

FAA AC 150/5300-13A, *Airport Design*, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector, which acts at a right angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each Airport Reference Code is shown in **Table 2-19**.

Table 2-19 Crosswind Components

Allowable Crosswind in Knots	Airport Reference Code
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III & C-I through D-III
20 knots	A-IV through D-VI

Source: FAA AC 150/5300-13A *Airport Design*

Wind conditions are based on weather observations taken in at Canyonlands Field during the period from 2004-2014. This data, obtained from the National Oceanic and Atmospheric Administration (NOAA) Climate Data Center, consists of 89,701 hourly observations separated by visual meteorological conditions (VMC) and instrument meteorological conditions (IMC), and "all weather" conditions as described below. Data was obtained from the ASOS located on the airfield which indicates that Runway 3-21 provides 92.72 percent wind coverage for aircraft in the ARC A-I through C-III, the percentage values are provided in **Table 2-20** and **Figure 2-36** and **Figure 2-37**. Therefore, the existing runway configuration is not adequate for aircraft in categories with an ARC less than A/B-II.

Table 2-20 Canyonlands Field Wind Data

Runway 3-21	10.5 Knots	13 Knots	16 Knots
All-Weather	92.72%	95.50%	98.07%
IFR Conditions	92.76%	95.04%	97.44%

Based on 89,701 observations at the Canyonlands Field ASOS between 2004 and 2014

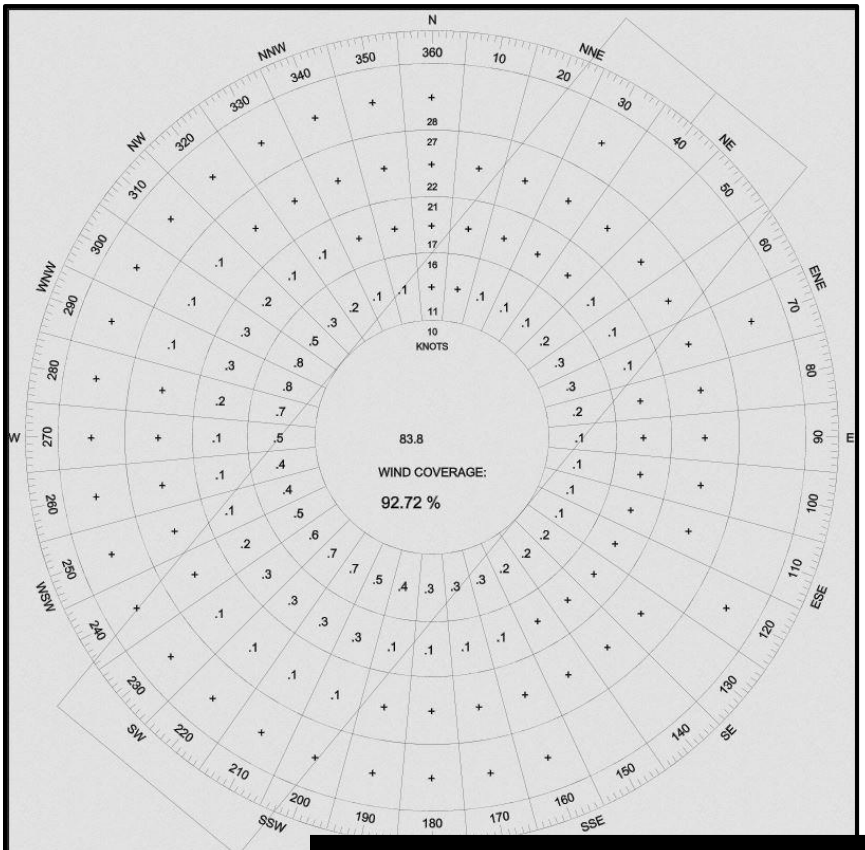


Figure 2-36 Canyonlands Field Windrose – All Weather

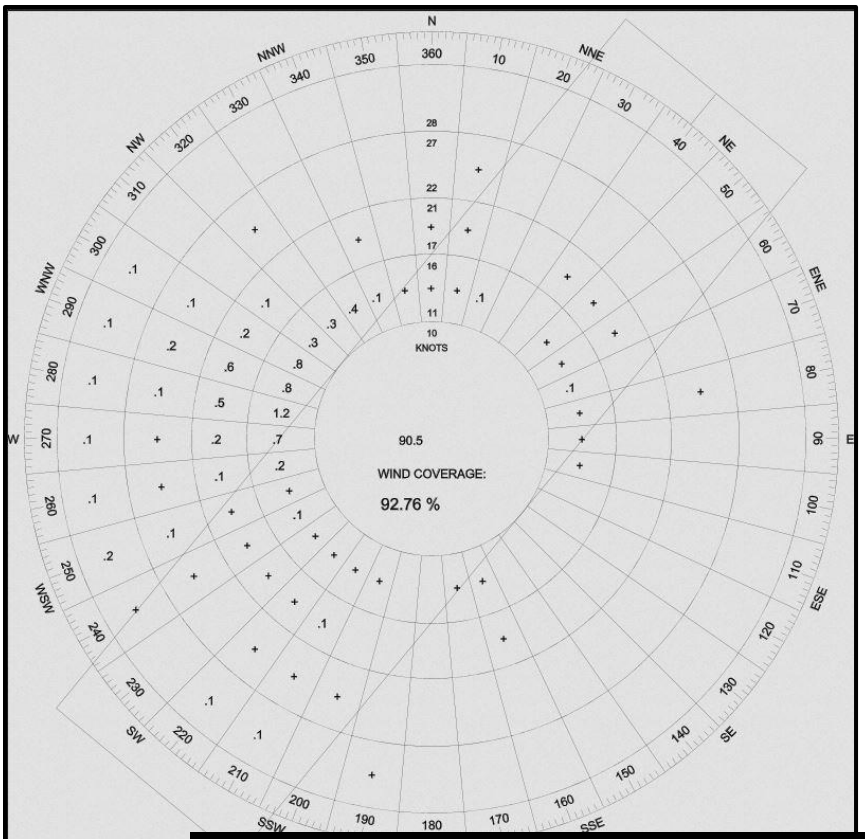


Figure 2-37 Canyonlands Field Windrose – IFR Conditions

When conducting a wind coverage evaluation analysis, the FAA suggests that historical weather information for the last ten consecutive years be utilized. Records of lesser duration may be acceptable on a case-by-case basis. In some instances, it may be desirable to obtain and assemble wind information for periods of particular significance, for example: seasonal variations; instrument weather conditions; daytime versus nighttime; and regularly occurring gusts.

2.17 Environmental Inventory

The requirements of the National Environmental Policy Act (NEPA) require an environmental determination before implementing proposed airport improvement projects. The purpose of the environmental inventory is to identify key environmental resources that may be affected by potential airport development. The data compiled in this section will be used later in this study. Background research was completed by reviewing available documentation from the U.S. Environmental Protection Agency (EPA), Flood Insurance Rate Maps (FIRM), National Register of Historic Places (NHRP), and Federal Emergency Management Agency (FEMA).

The level of the NEPA documentation required is usually based on the results of the environmental overview and the requirements specified in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures,* and FAA Order 5050.4B, *National Environmental Policy Act*

(NEPA) Implementing Instructions for Airport Actions. Typical levels of analysis and determinations include Categorical Exclusions (CatEx), Environmental Assessments (EA) with Finding of No Significant Impacts (FONSI), and Environmental Impact Statements (EIS) with a Record of Decision (ROD).

2.17.1 Air Quality

The National Ambient Air Quality Standards (NAAQS) are set forth by the Clean Air Act Amendments of 1997 and establish the pollutant concentrations that states, cities and towns must comply with within specified timeframes.

Air quality attainment maps were obtained from the U.S. Environmental Protection Agency's (EPA) Green Book's 2014 map of nonattainment and attainment areas. Grand County is located within an attainment area, as shown in **Figure 2-38**. An attainment area is a zone within which the level of a pollutant is considered to meet National Ambient Air Quality Standards. Air pollutants are emitted by a variety of means and sources at airports including: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.

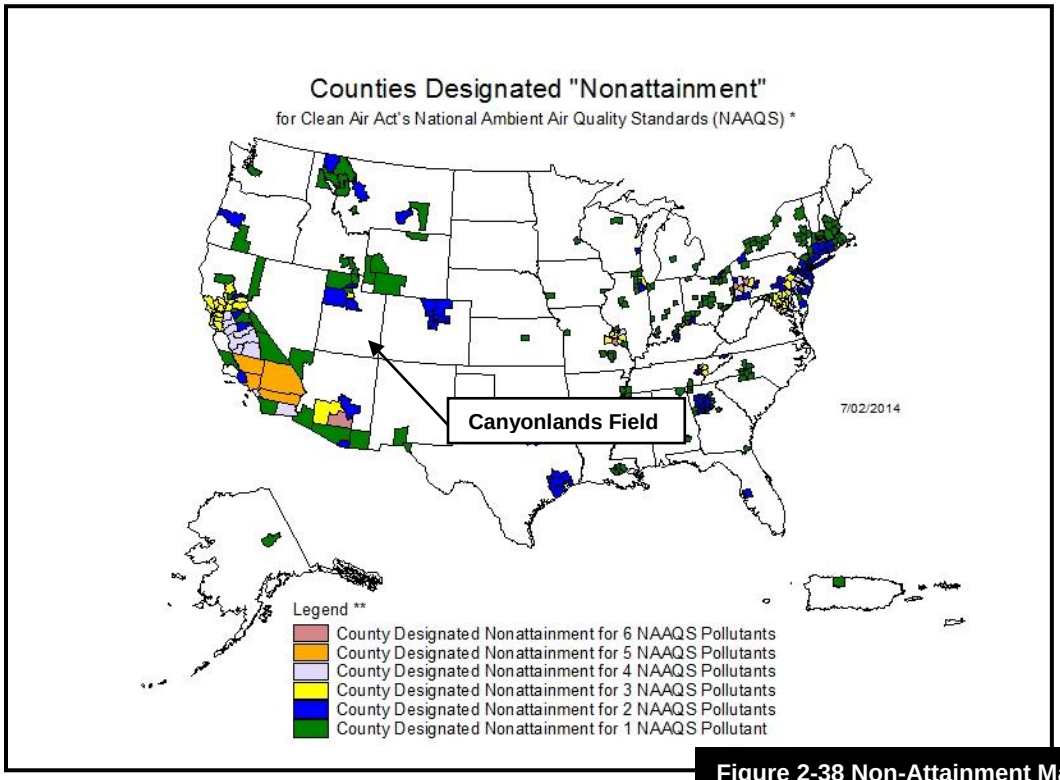


Figure 2-38 Non-Attainment Map

2.17.2 Compatible Land Use Planning

The FAA recommends that airport sponsors protect the areas surrounding an airport from incompatible development. Incompatible development includes those land uses which would be sensitive to aircraft noise or over flight, such as residences, schools, churches and hospitals

and those uses which could attract wildlife and cause a hazard to aircraft operations such as landfills, ponds and wastewater treatment facilities. The land uses surrounding the Airport include industrial and commercial development.

The Airport is located within unincorporated Grand County and falls in the "Airport Limitation District" (AL District). According to Grand County Zoning Plans, projects within the AL District are to "…establish standards assuring the long-range, safe and beneficial use of Canyonlands Field." The County ordinance also states there is a height restriction within the AL District, which is a 35 foot unless otherwise noted by the ALP. The adjacent area is non-zoned land. All land uses surrounding Canyonlands Field are considered to be compatible with airport operations. Compatible Land Use and Height Restriction drawings included as part of this Airport Layout Plan should be used as a tool for the County in reviewing and evaluating the compatibility of proposed development in the vicinity of the Airport.

2.17.3 Department of Transportation Act – Section 4 (f)

The Department of Transportation Act (DOT Act) of 1966 included a special provision - Section 4(f) - which stipulated that the Federal Highway Administration (FHWA) and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply:

- There is no feasible and prudent alternative to the use of land.
- The action includes all possible planning to minimize harm to the property resulting from use.

An additional Section, 6(f), follows the same guidelines but applies to the aforementioned areas if Land and Wildlife Conservation Funds were used. There are no Section 4(f) properties located within the immediate vicinity of the airport property which has the potential to be designated as Section 4(f) and/or Section 6(f) properties. The nearest area considered to be classified under Section 4(f) is Arches National Park located approximately three miles east of Canyonlands Field. Canyonlands National Park is located approximately 15 miles southwest of Canyonlands Field.

2.17.4 Prime and Unique Farmlands

The Farmland Protection Policy Act (FPPA) authorizes the Department of Agriculture to develop criteria for identifying the effects of Federal programs upon the conversion of farmland to uses other than agriculture.

Conversion of "Prime or Unique" farmland may be considered a significant impact. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed or fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland which is used to produce

specific high value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits and vegetables.

The land encompassed by Canyonlands Field is not classified as prime or unique by the U.S. Department of Agriculture (USDA).

2.17.5 Floodplains

Executive Order 11988, *Federal Floodplain Management*, states that agencies must reduce the risk of flood loss, minimize the impacts of floods on human safety, health, and welfare, and restore and preserve natural and beneficial values served by floodplains. Federal Emergency Management Agency (FEMA) floodplain maps were not available for the airport property. Historical data shows there have been no flooding events at the airport. Based on the airport elevation and surrounding drainages no floodplains at the airport are known to exist. The airport is located approximately 13 miles north of the Colorado River.

2.17.6 Fish, Wildlife and Plants

The *Endangered Species Act* (16 U.S.C. §1531 et. Seq. (1973)) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designed critical habitat of such species.

The U.S. Fish and Wildlife Service was consulted concerning the possibility of any impacts to threatened and endangered species and candidate species that may occur within the Airport environment. A list of federally threatened or endangered species was obtained for Grand County. Future development projects should be evaluated to determine if any of the listed species occur or would be impacted.

The species shown are currently listed for Grand County but do not necessarily occur at or in the vicinity of Canyonlands Field. The species are listed in **Table 2-21**.

Table 2-21 Threatened and Endangered Species, Grand County, Utah

Species	Status
Birds	
California condor (*Gymnogyps californianus*)	Experimental Population, Non-Essential
Greater sage-grouse (*Centrocerus urophasianus*)	Candidate
Mexican Spotted owl (*Strix occidentalis lucida*)	Endangered
Southwestern Willow flycatcher (*Empidonax traillii extimus*)	Endangered
Yellow-Billed Cuckoo (*Coccysuz americanus*)	Threatened
Fishes	
Bonytail chub (*Gila elegans*)	Endangered
Colorado pikeminnow (*Ptychocheilus lucius*)	Endangered
Humpback chub (*Gila cypha*)	Endangered
Razorback sucker (*Xyrauchen texanus*)	Endangered
Flowering Plants	
Jones Cycladenia (*Cycladenia humilis var. jonesii*)	Endangered

Source: USFWS, 2014

2.17.7 Wetlands

Executive Order 11990, *Protection of Wetlands,* requires federally supported projects to preserve wetlands and to avoid and minimize wetland impacts to the maximum extent practicable. The use of National Wetlands Inventory (NWI) mapping, field reconnaissance, and county soil survey can aid in identifying potential wetlands and jurisdictional waters of the U.S. subject to the permitting jurisdiction of the U.S. Corp of Engineers (USACE). There do not appear to be any wetlands within the Airport boundary as shown in **Figure 2-39**. However, arroyos located southwest of Runway 3 are likely considered jurisdictional waters of the United States and would be subjected to permitting requirements.

Figure 2-39 Wetlands Map

2.17.8 Noise

FAR Part 150 is a voluntary program that U.S. airports may undertake to seek a balance between their operational needs and the noise impacts their operations are having on the surrounding community. The study of airport noise and land use compatibility authorized under the 14 CFR Part 150, *Airport Noise Compatibility Planning*, which sets out rules and guidelines and authorizes Federal assistance for the preparation of airport noise compatibility programs. There are two principal technical elements:

- Noise Exposure Maps (NEM) – describe existing noise conditions are the Airport area and projected future conditions if no noise abatement actions were taken.

- Noise Compatibility Program (NCP) – provides guidelines for the mitigation of existing incompatible land uses and the prevention of development that would introduce new incompatible uses.

The level of sound can be measured objectively, but noise, unwanted sound, is a very subjective matter. Techniques have been developed that measure single events in an effort to measure the noise in objective terms, giving extra weight to those sound frequencies that are most annoying to the human ear. The FAA has suggested, but not mandated, guidelines for determining land use compatibility with a given Ldn or DNL level (day/night average sound level). Ideally, residentially areas should be located in areas below 65 DNL. The existing 65 DNL noise contour does not extend beyond the Airport boundary; thus there are no noise sensitive or incompatible land uses within the 65 DNL noise contour. The existing noise contour is shown in **Figure 2-40**. Noise sensitive areas in the vicinity of Canyonlands Field include Arches National Park located three miles to the east.

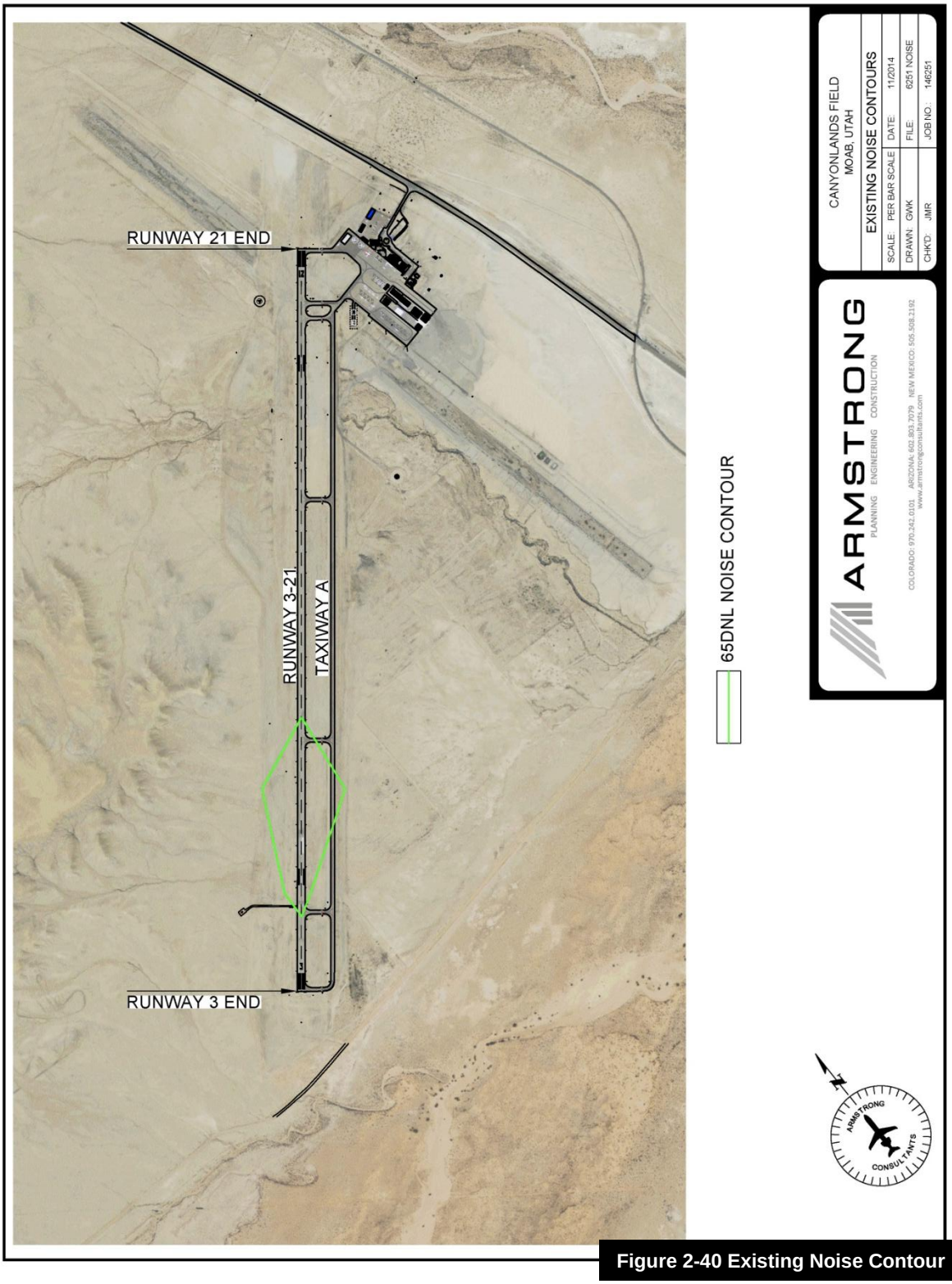


Figure 2-40 Existing Noise Contour

CHAPTER THREE

FORECASTS OF AVIATION DEMAND

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER THREE
FORECASTS OF AVIATION DEMAND

3.1 Introduction

Forecasts of aviation activity serve as a guideline for the timing required for implementation of airport improvement programs. While such information is necessary for successful comprehensive airport planning, it is important to recognize that forecasts are only approximations of future activity, based upon historical data and viewed through present situations. They must therefore, be used with careful consideration, as they may lose their validity with the passage of time.

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the orderly development of aviation facilities at Canyonlands Field.

At airports served by air traffic control towers comprehensive logs of aircraft operations are available. At airports without control towers, as in the case of Canyonlands Field, the existing aviation activity levels are based upon approximations from Airport Management, Fixed Base Operator (FBO) operation logs or other miscellaneous sources which monitor activity levels. Activity projections are made based upon estimated growth rates, area demographics, industry trends and other indicators. Forecasts are prepared for the Initial-Term (0-5 years); the Intermediate-Term (6-10 years) and the Long-Term (11-20 years) time frames. Utilizing forecasts within these time frames will allow airport improvements to be timed to meet demand, but not so early as to remain idle for an unreasonable length of time.

There are four types of aircraft operations considered in the planning process. These are termed “based, transient, local and itinerant.” They are defined as follows:

Based aircraft are defined aircraft based (stored at the airport on a permanent, seasonal or long-term basis) with no attempt to classify the operations as to purpose. An example of a based aircraft is an aircraft which is stored in a hangar at Canyonlands field year-round.

Transient aircraft are defined as the aircraft that utilize the airport but are not based at the airport under study. An example of a transient aircraft is an aircraft parked at Canyonlands Field for a weekend visit from another airport.

Local operations are defined as aircraft (departures or arrivals) for the purpose of training, pilot currency or pleasure flying within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas and pleasure flights that originate and terminate at the airport under study. These operations can be conducted by both based and transient aircraft.

Itinerant operations are defined as arrivals and departures that originate or terminate at another airport. These operations can be conducted by both based aircraft and transient aircraft.

3.2 National and Regional Trends

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation. The national trends listed below are from the FAA forecast fiscal years 2014-2034. Given the current instability in the global economy, uncertainty remains in the timing for the recovery of demand in the aviation industry, therefore the FAA has placed a larger variance around these forecasts than in other years.

3.2.1 Regional Carriers

The FAA 2014-2034 forecast predicts regional carrier enplanements to increase 0.6 percent in 2014, increase an additional 2.7 percent per year between 2015 through 2019 and grow 2.6 percent a year thereafter until 2034. Regional carrier revenue passenger miles are forecast to increase 1.8 percent in 2014 and grow at an average annual rate of 2.3 percent for the remaining 20 years of the forecast period. The regional air carrier passenger aircraft fleet is projected to decrease to 2,141 aircraft in 2034 at an average annual decrease of 0.1 percent. The regional jet fleet is anticipated to increase from 1,642 aircraft in 2013 to 1,953 aircraft in 2034, an annual increase of 0.8 percent. It is anticipated that within the forecast period, all regional jets and turboprops with a capacity of 50 seats or less will be retired. Regional carriers have begun to favor utilizing larger capacity aircraft which offer enhanced operating economics. In doing so, regional carriers can reduce their small aircraft fleet while maintaining comparable passenger capacity levels. This has direct implications for Canyonlands Field and will be further discussed in this chapter.

3.2.2 Cargo

Total air cargo revenue ton miles (RTMs) (freight/express and mail) decreased 4.8 percent in 2013 but are expected to increase 1.2 percent in 2014, with an average annual rate of 4.2 percent to 2034. Domestic RTMs are forecasted to increase 1.4 percent a year and international RTMs to increase 5.4 percent a year. The cargo fleet is expected to increase to 1,182 aircraft in 2034, an average increase of 2.4 percent per year.

3.2.3 General Aviation

The general aviation fleet is anticipated to increase from 202,865 aircraft in 2013 to 225,700 in 2034, growing an average of 0.5 percent a year. Fixed-wing turbine aircraft are expected to grow at a rate of 2.6 percent per year. Fixed-wing piston aircraft and rotorcraft are projected to decline at a rate of 0.3 percent per year. General aviation hours flown is forecast to increase at an average annual growth of 1.4 percent per year. Fixed-wing turbine aircraft hours flown are forecasted to grow at a rate of 3.2 percent per year and jet powered aircraft at a rate of 4.2 percent per year. Fixed-wing piston aircraft hours flown are anticipated to decline at a rate of 0.4 percent per year and rotorcraft hours flown are forecasted grow at a rate of 2.8 percent per year.

3.2.4 Aviation Industry Trends

One important aviation industry trend is the increasing amount of research funding for programs like NextGen. The National Aeronautics and Space Administration (NASA), Federal Aviation Administration, States, industry and academic partners have joined forces to pursue NextGen. This long-term strategic undertaking seeks to bring next-generation technologies and improved air access to small communities. Current NASA investments in aircraft technologies are enabling industry to bring affordable, safe and easy-to-use features to the marketplace, including "Highway in the Sky" glass cockpit operating capabilities, affordable crashworthy composite airframes, more efficient IFR flight training and revolutionary aircraft engines. To facilitate this initiative, a comprehensive upgrade of public infrastructure must be planned, coordinated and implemented within the framework of the national air transportation system. State partnerships are proposed to coordinate research support in key public infrastructure areas.

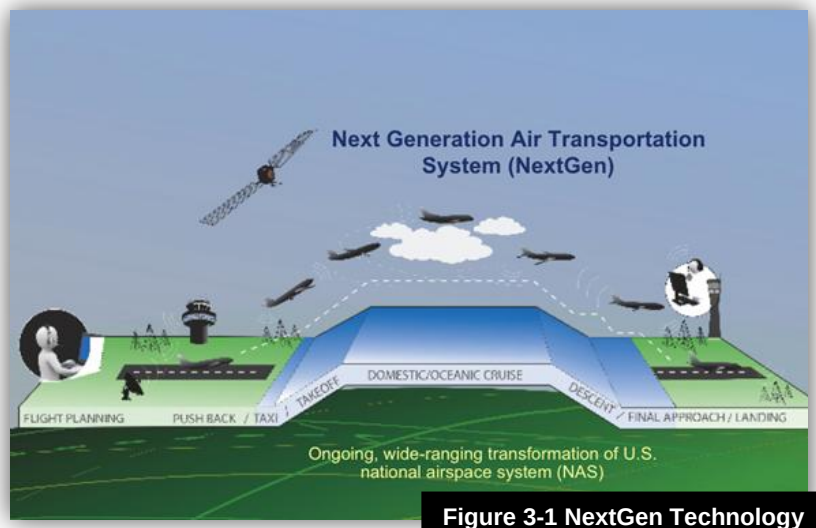


Figure 3-1 NextGen Technology

Figure 3-2 NextGen Precision

3.3 Existing Baseline Activity Levels

The Airport Manager reports 31 based aircraft and 15,250 total annual operations at Canyonlands Field. The Airport Manager reports 9,237 passenger enplanements from January through December 2014. Approximately 73 percent of enplanements were on scheduled air carrier flights while the remaining 27 percent of enplanements were on scenic air tours or charter flights.

3.4 Available Activity Forecasts

It is important to evaluate historical and existing activity levels alongside currently available forecasts from external sources in order to formulate realistic forecast figures. The FAA Terminal Area Forecasts (TAF) (October 2014) indicates 31 existing based aircraft, 10,150 existing annual operations and 4,187 annual enplanements for Canyonlands Field for 2014 and forecasted to remain constant through 2034. The 2008 UCASP forecasts 27 based aircraft, 12,808 annual operations and 3,698 annual enplanements in 2026. Both the FAA TAF and UCASP forecasts are substantially lower than the actual operations figures at Canyonlands Field. Therefore, the FAA TAF and UCASP will not be utilized for forecasting aviation demand.

3.5 Forecasts of Aviation Activity

3.5.1 Factors Influencing Aviation Demand at Canyonlands Field

As discussed in Chapter Two, *Inventory*, tourism is an integral part of Grand County and Moab's economy. The area is widely known for their superior outdoor attractions. Arches National Park, Canyonlands National Park, the Colorado River and Dead Horse Point State Park, which are all located near Canyonlands Field, offer visitors a vast number of activities. Between these destinations, there are prime areas for hiking, mountain biking, rafting, driving off-road vehicles and horseback riding.

In 2013, Arches and Canyonlands National Parks together hosted approximately 1.5 million visitors. This number represents a substantial growth from the 1.1 million visitors in 2004. Since 2004, the two parks have experienced a 3.54 percent average annual increase in visitors.

The vast majority of the visitors utilizing these recreational areas also contribute to the local economy by staying in hotels or campgrounds, eating at restaurants and shopping at local stores. Moab offers several tourist attractions such as art galleries, museums, festivals and seasonal events, golfing and wineries.

These visitors directly impact Canyonlands Field by departing and arriving on flights operated by airlines, utilizing air tours (**Figure 3-3**), helicopter tours, skydiving, hot air balloons, operating their own general aviation aircraft to the airport or participating in recreational activities such as skydiving.

Figure 3-3 Redtail Aviation Quest Kodiak

Another major factor influcing aviation demand at Canyonlands Field is the overall trend in general aviation and regional airline fleet mix transitioning from smaller aircraft to larger aircraft. The hours flown and number of pistion driven general aviation aircraft are

forecasted to decline while turbine and jet powered aircraft are expected to increase.

Regional carriers have also indiciated the retirement of both turboprop and jet powered aircraft with passenger capacities less than 50 seats in favor of larger capacity regional aircraft. This would include the Embraer 120 Brasilia (**Figure 3-4**) which historically served Canyonlands Field. It is projected the replacement aircraft for the Embraer 120 would be the 50 seat Bombardier Canadair Regional Jet (CRJ) 200 or Embrear 140/145. As previously indicated, the CRJ-200 and ERJ-140/145 have a capacity of 50 seats or less and are also slated for retirement from passenger service prior to 2034. It is likely the CRJ-200 and ERJ-140/145 will be retired in the early to mid-2020's according to recent projections. By the mid to late-2020's and onwards, the regional air carrier fleet mix will likely consist of the Bombardier CRJ-700/900 (**Figure 3-5**) and CS100, Embraer 170 and 175 and Mitsubishi Regional Jet, or similar aircraft.

Figure 3-4 SkyWest Airlines EMB-120

SkyWest Airlines announced effective April 30, 2015 they will no longer serve Canyonlands Field due to the retirement of the Embraer 120. Great Lakes Airlines has been awarded the Essential Air Service contract as a result of SkyWest's departure from Canyonlands Field.

The accelerated retirement of regional aircraft with 50 seat or less capacity is primarily attributed towards an increase in the experience required for pilots and pilot rest requirements for Part 121 airlines. In doing so, this increased the minimum experience requirements for Part 121 airlines from a commercial pilot certificate to requiring an Airline Transport Pilot (ATP) certificate. Additionally, the change in rest hour requirements changed from eight hours to 10 hours. Both of these have created a shortage of qualified pilots to operate scheduled air carrier flights. In response, many regional airlines have reduced their smaller capacity aircraft fleets and have been replaced with larger aircraft in order to adequately schedule flights.

Figure 3-5 Bombardier CRJ-700

Mainline airlines, regional airlines and scheduled cargo airlines are all required to adhere to these regulations. Commuter airlines operate under Part 135 which have less stringent regulations.

3.5.2 Enplanement Forecast

A comparative analysis of enplanement forecasts was accomplished using four methodologies to derive a preferred forecast of enplanements for Canyonlands Field. The forecast methodologies consider growth rates for the City, County, State and tourism industry for comparative analysis.

Enplanements at Canyonlands Field have grown at an average annual growth rate of five percent between 2004 and 2013. In 2014, there were 9,237 enplanements at Canyonlands Field, which represents a 23.7 percent growth over the 2013 total. This growth can be attributed to access to more reliable air service provided by SkyWest Airlines, increases in local purchasing power and growth in visitors to the Moab area.

The first method projected annual enplanement growth based on the historical and forecasted increase in Personal Per Capita Income (PCPI) for Grand County. The forecasted PCPI was calculated with the 5.9 percent average annual growth rate experienced in Grand County over the previous decade. This method results in 29,070 enplanements for Canyonlands Field in 2034. This method is considered to be the “high-forecast”. The Local Income method results are shown in **Table 3-1**.

Table 3-1 Local Income Method

Year	Per Capita Personal Income	Total Enplanements
2014	$30,337	9,237
2019	$40,407	12,303
2024	$53,818	16,387
2029	$71,682	21,826
2034	$95,475	29,070

The second method projected enplanements in direct relation to forecasted visitor growth at Arches and Canyonlands National Parks. There is an anticipated 3.57 percent average annual visitor growth over the 20 year period. This results in 18,636 enplanements in 2034. This method is considered to be the “average-forecast”. The National Park Visitor method results are shown in **Table 3-2**.

Table 3-2 National Park Visitor Method

Year	Forecasted Park Visitors	Total Enplanements
2014	1,600,294	9,237
2019	1,907,228	11,009
2024	2,273,031	13,120
2029	2,708,996	15,637
2034	3,228,577	18,636

The third method applied the FAA Regional Airline Forecast enplanements forecasted growth rate for regional airlines. The annual growth rate of 2.7 percent results in 15,509 annual enplanements in 2034. This method is considered to be the “low-forecast”. The FAA Regional Airline Forecast method results are shown in **Table 3-3**.

Table 3-3 FAA Regional Airline Forecast Method

Year	Annual Average Growth	Total Enplanements
2014	2.7%	9,237
2019	2.7%	10,553
2024	2.7%	11,998
2029	2.7%	13,641
2034	2.7%	15,509

The fourth method is a cohort forecast which averages the Local Income, National Park Visitor and FAA Regional Airline Forecast methods together. This method results in 21,072 annual enplanements in 2034. This method has been selected as the preferred method as it represents a sustained positive growth that factors in the high-demand for local visitor attractions while accommodating future changes to the regional air carrier industry. The Cohort Method results are shown in **Table 3-4**. A comparison of the four forecasting methods against the FAA TAF and UCASP Forecast for Canyonlands Field enplanements is shown in **Figure 3-6**.

Table 3-4 Enplanement Forecast Methods

Year	Local Income Method	National Park Visitor Method	FAA Regional Airline Forecast Method	Cohort Method (Preferred)
2014	9,237	9,237	9,237	9,237
2019	12,303	11,009	10,553	11,288
2024	16,387	13,120	11,998	13,835
2029	21,826	15,637	13,641	17,035
2034	29,070	18,636	15,509	21,072

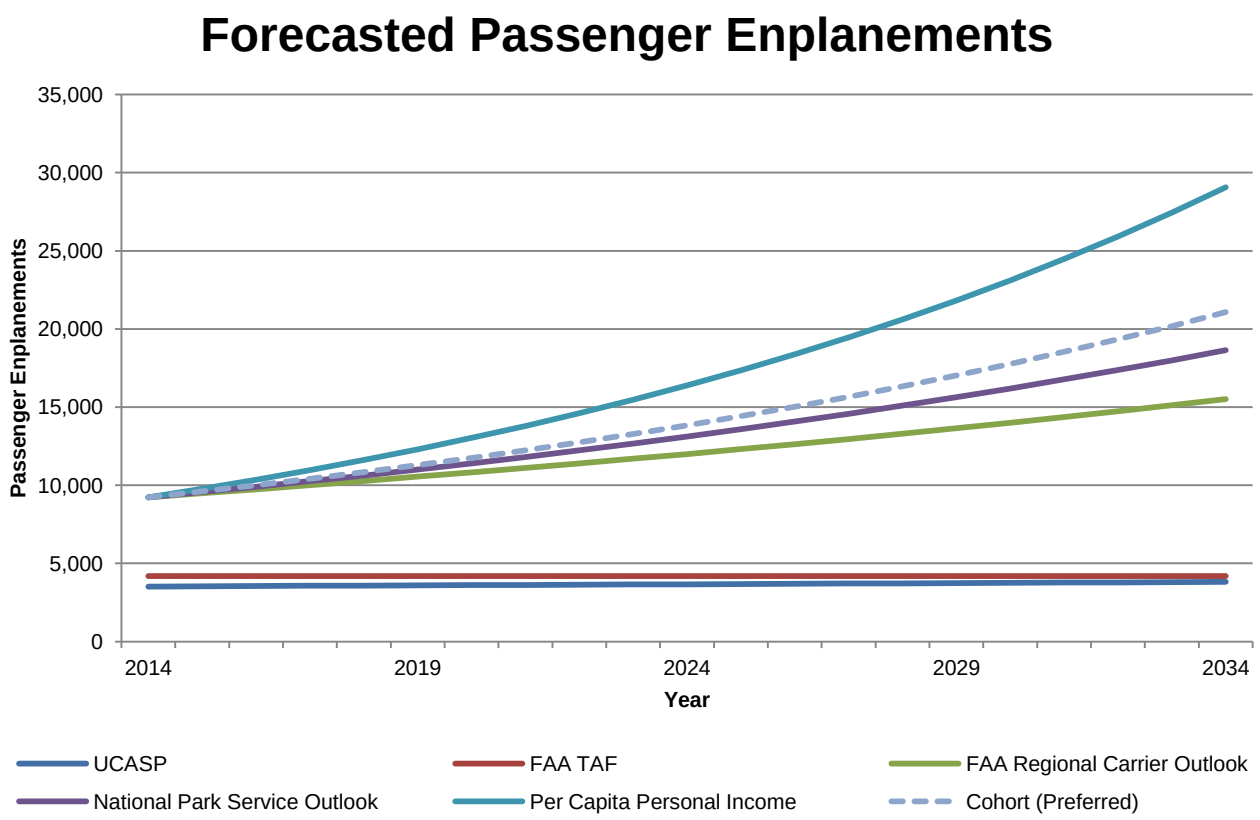


Figure 3-6 Forecasted Passenger Enplanements

Air Service Impacts on Enplanement Forecasts

As mentioned, Canyonlands Field receives subsidized air service through the Essential Air Service program. Carriers which are awarded EAS routes are typically regional airlines (i.e. SkyWest Airlines, Endeavor Air, Envoy Air, Great Lakes Airlines, etc.) or commuter airlines (i.e. Air Choice One, Cape Air, Redtail Aviation, SeaPort Airlines, etc.).

Regional airlines offer a streamlined service to mainline carriers to provide seamless onward connections. Regional airlines usually operate under the brand of a major airline as an affiliate carrier. For example, at Canyonlands Field, SkyWest Airlines operated as Delta Connection in cooperation with Delta Air Lines. Passengers departing on SkyWest Airlines checked-in at a Delta Air Lines-branded counter, received a Delta Air Lines-branded ticket and obtained frequent flier miles through Delta's program. Additionally, once in Salt Lake City, passengers would be able to connect to another Delta Air Lines flight without having to recheck-in or be re-screened by security. Regional airlines also tend to operate large turboprop and jet-powered aircraft which typically have greater maintenance reliability. Overall, these carriers are able to provide a nearly equivalent level of service and convenience offered by major carriers.

Commuter airlines (also known as air taxis) offer standalone services between small communities and medium to large-sized cities. They typically do not offer interline agreements

which are utilized by regional airlines and therefore are not able to provide a seamless onward connection. Additionally, commuter airlines do not offer integrated service with major carriers, so their passengers are unable to check their luggage through to their final destination or obtain frequent flier miles. Passengers are typically required to recheck-in at their connecting airport and often times are required to be re-screened. Commuter airlines typically operate smaller single or multi-engine turbine-driven and multi-engine piston-driven aircraft which tend to have lower maintenance reliability and greater wind restrictions.

The type of carrier operating at Canyonlands Field can have a strong impact on the airport's forecasted enplanements. As shown with recent historical enplanements, the availability of SkyWest Airlines service produced substantially greater numbers than recent years. As EAS contracts can be awarded to either regional or commuter airlines, it is prudent to evaluate the impacts of the type of carrier operating at Canyonlands Field on forecasted enplanements. Three scenarios have been developed to evaluate these potential impacts. The results of the three scenarios are shown in **Table 3-5** and **Figure 3-7**.

- Scenario One: The airport is continued to be served by a regional airline operating under a major airline brand. This scenario is consistent with the preferred enplanements shown in **Table 3-4**.

- Scenario Two: The airport is served by a commuter airline operating as a standalone brand. This scenario assumes approximately 50 percent reduction in airline enplanements; however, charter and scenic air tour enplanements are not affected. The anticipated reduction is attributed to smaller aircraft operating the route, reduced convenience and passenger perception.

- Scenario Three: The airport is not served by a scheduled air carrier. Enplanements would be generated through charter flights and scenic air tours only. This scenario assumes enplanements to be reduced by approximately 73 percent.

Table 3-5 Air Service Scenarios

Year	Scenario One			Scenario Two			Scenario Three		
	Total	RA	AT	Total	RA	AT	Total	RA	AT
2014	9,237	6,708	2,529	4,619	2,071	2,548	2,494	0	2,494
2019	11,288	8,240	3,048	5,644	2,530	3,114	3,048	0	3,048
2024	13,835	10,100	3,735	6,918	3,101	3,816	3,735	0	3,735
2029	17,035	12,436	4,599	8,518	3,819	4,699	4,599	0	4,599
2034	21,072	15,383	5,689	10,536	4,723	5,813	5,689	0	5,689

RA= Regional Airline Enplanements
AT= Air Taxi Enplanements (i.e. scenic air tours/charter)

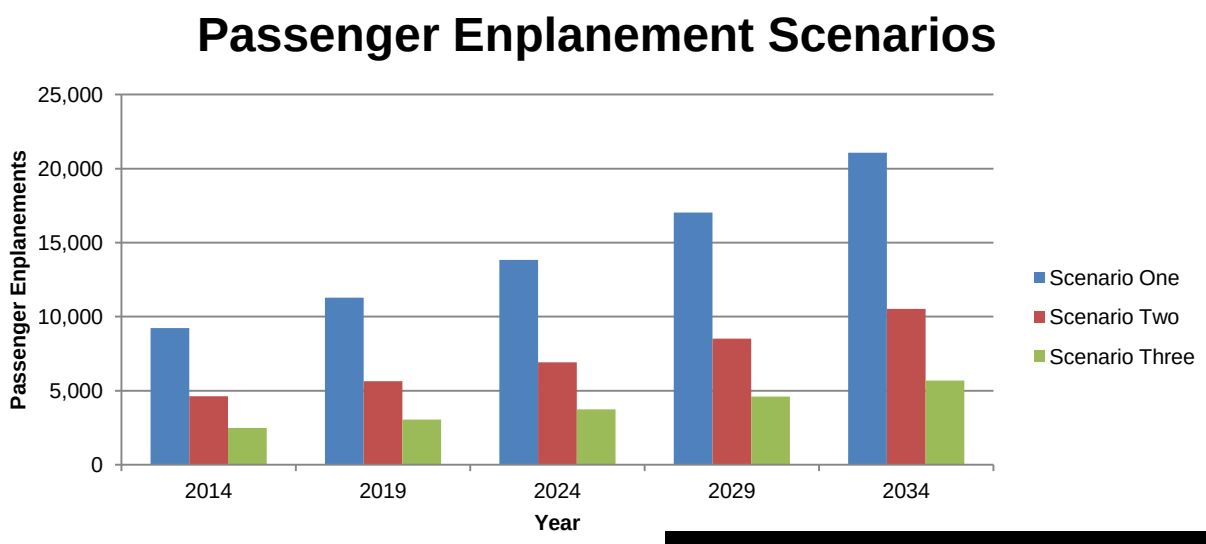


Figure 3-7 Forecasted Enplanements Scenarios

3.5.3 Based Aircraft Forecast

A comparative analysis of based aircraft forecasts was accomplished using three methodologies to derive a preferred forecast of based aircraft for Canyonlands Field. The forecast methodologies consider growth rates for the City, County, State and region for comparative analysis.

The first method utilized a per capita approach that projects the number of based aircraft in direct proportion to the projected population of Grand County. This resulted in 38 based aircraft in 2034. The second method results are shown in **Table 3-6**.

Table 3-6 Per Capita Method

Year	Total Population	Total Based Aircraft
2014	9,616	31
2019	10,129	33
2024	10,668	34
2029	11,237	36
2034	11,836	38

The second method is a market share forecast which applies the existing number of based aircraft as a percentage of the total based aircraft in the State of Utah. In the 2014 FAA TAF, the State of Utah has 1,880 based aircraft. According to airport management, there are 31 based aircraft at Canyonlands Field. Canyonlands Field has a 1.65 percent share of the total based aircraft market in Utah. The 2014 FAA TAF projects 2,248 based aircraft in the State of Utah in 2034. By applying the 1.65 percent share, Canyonlands Field would be projected to have 37 based aircraft in 2034. The first method results are shown in **Table 3-7**.

Table 3-7 Market Share Method

Year	FAA TAF – Utah	Total Based Aircraft
2014	1,880	31
2019	1,967	32
2024	2,048	34
2029	2,140	35
2034	2,248	37

It is anticipated that Canyonlands Field based aircraft growth will continue to rise as projected. A cohort forecast was utilized averaging the Per Capita and Market Share methods. This method takes into factors the population growth trends within the State of Utah and Grand County which would have the greatest impact on based aircraft. This method projected a total of 38 based aircraft in 2034. All forecasts are depicted in **Table 3-8**. A comparison of the three forecasting methods against the FAA TAF and UCASP Forecast for Canyonlands Field enplanements is shown in **Figure 3-8**. The projected based aircraft fleet mix is shown in **Table 3-9**.

Table 3-8 Based Aircraft Forecast Methods

Year	Per Capita Method	Market Share Method	Cohort Method (Preferred)
2014	33	33	31
2019	35	35	33
2024	37	36	34
2029	39	38	36
2034	41	39	38

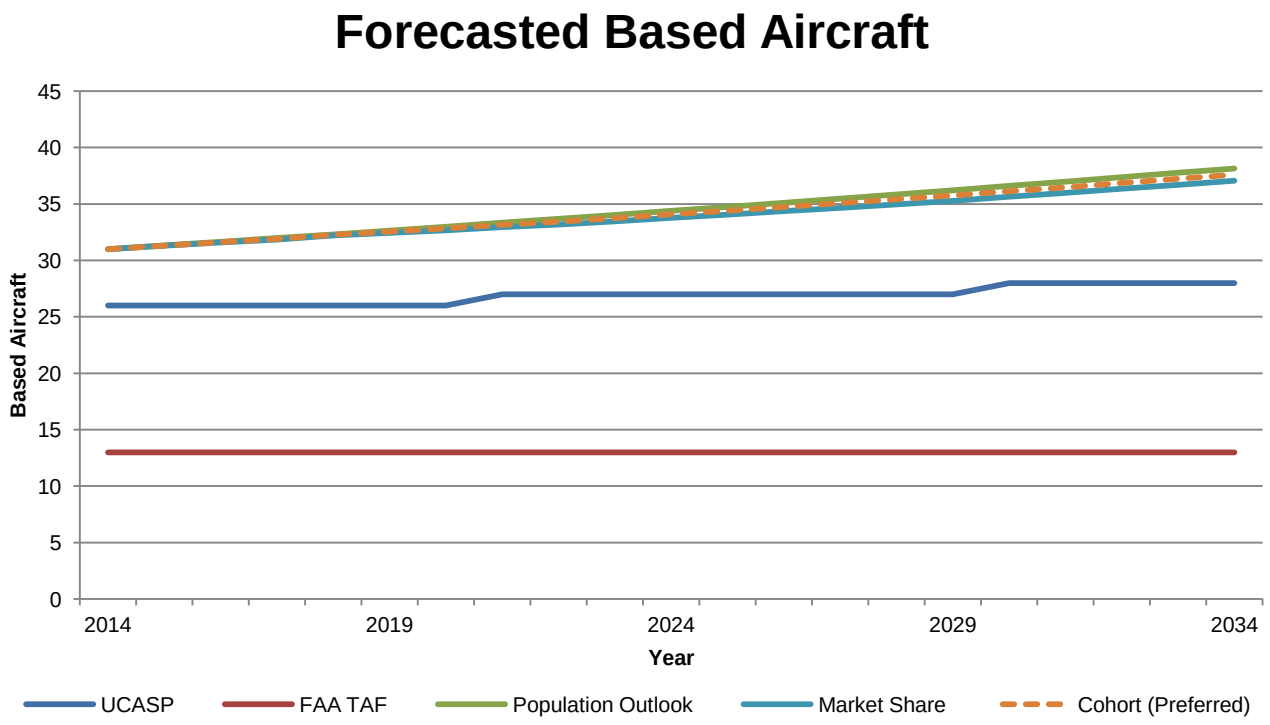


Figure 3-8 Forecasted Based Aircraft

Table 3-9 Forecasted Based Aircraft Fleet Mix

	2014	2019	2024	2029	2034
Single Engine Aircraft	31	32	33	34	35
Multi Engine /Turbo-Prop Aircraft	0	1	1	1	1
Jet Aircraft	0	0	0	0	1
Rotorcraft	0	0	0	1	1
Total Based Aircraft	**31**	**33**	**34**	**36**	**38**

3.5.4 Aircraft Operations Forecast

These methods were used to to develop a preferred forecast of aircraft operations at Canyonlands Field. Each method utilized the preferred based aircraft forecast of 38 based aircraft in 2034, and then applied an Operations per Based Aircraft (OPBA) to the based aircraft forecast. The methods are summarized as follows:

Method 1: Existing operations and based aircraft (492 OPBA)

Method 2: FAA Order 5090.3C (450 OPBA)

Method 3: UCASP (474 OPBA)

For the first method, the base year level of operations per based aircraft of 492 was applied to the preferred based aircraft forecast. Applying 492 OPBA to the preferred based aircraft forecast results in 18,694 annual operations in 2034. This method is considered to be the “high-forecast”.

For the second method, a general guideline from FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) of 450 OPBA for busy reliever airports was applied to the based aircraft forecast. Applying 450 OPBA to the preferred based aircraft forecast results in 17,100 forecast operations in 2034. This method is considered to be the “low-forecast”.

The third method is the OPBA calculated from the Utah Continuous Airport System Plan forecast for 2026. The projected OPBA for Canyonlands Field is 474. Applying 474 OPBA to the preferred based aircraft forecast results in 18,012 annual operations in 2034. This method is considered to be the “average-forecast”.

These estimates provide a likely range of activity for future operations at Canyonlands Field and are shown in **Table 3-10** and **Figure 3-9**. Aircraft operations are expected to increase with the additional based aircraft and future development. It is reasonable to anticipate that the OPBA will remain constant. Therefore, Method 1 has been selected as the preferred operations forecast.

3.5.5 Itinerant and Local Operations

Local operations consist of training, business and recreational flights in the area. Itinerant flights, including those by locally based aircraft, primarily consist of airline, personal transportation, business transportation and recreational flights to and from other airports. The existing split of 25 percent itinerant operations and 75 percent local operations is expected to remain fairly constant over the 20 year planning period. Anticipated users whose operations would likely be considered local include agricultural, aerial observation and surveying, recreation, tourism and flight training. The breakdown of itinerant operations is approximately 26 percent air taxi, 72 percent general aviation and two percent military. Within the air taxi category, 17.5 percent consists of scheduled airline operations with the remaining 82.5 percent including charter or air tour operations. It is expected that military operations will remain constant throughout the planning period. The current and forecasted air operations percentages are shown in **Figure 3-10**. The preferred total annual operations with associated operations are shown in **Figure 3-11**.

Table 3-10 Forecasted Annual Operations

Year	Air Taxi	GA-Itinerant	GA-Local	Military	Total Ops
2014	4,000	3,500	7,500	250	15,250
2019	4,262	3,730	7,992	250	16,234
2024	4,394	3,844	8,238	250	16,726
2029	4,656	4,074	8,730	250	17,710
2034	4,918	4,303	9,222	250	18,694

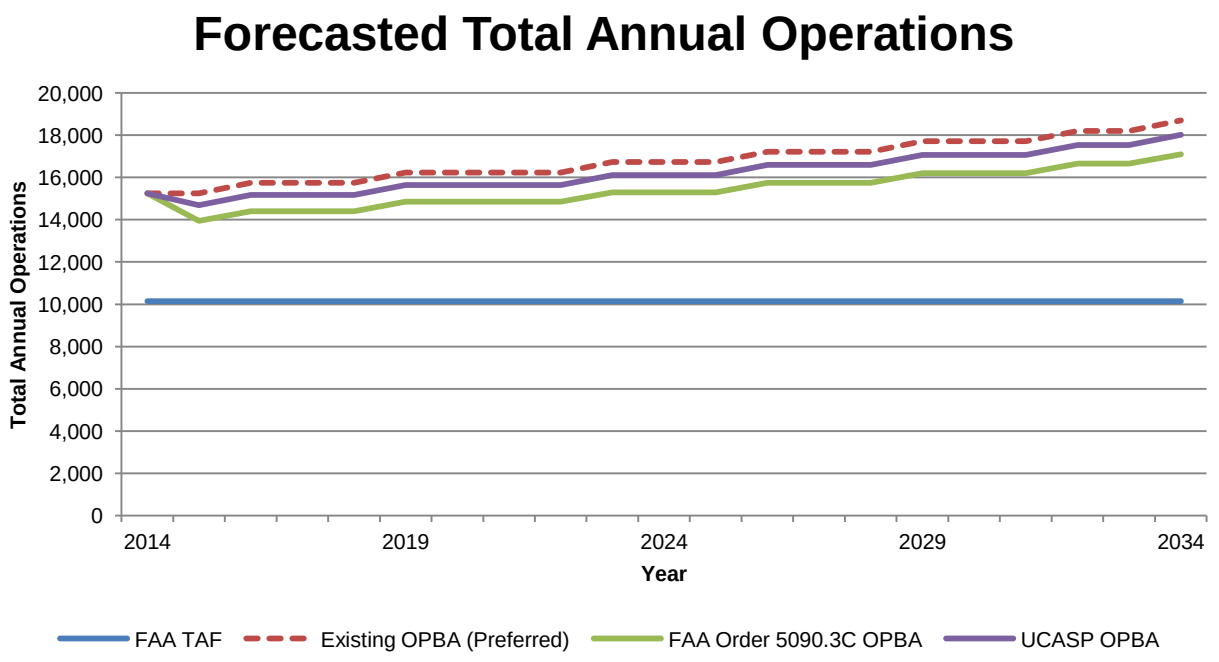


Figure 3-9 Forecasted Total Annual Operations

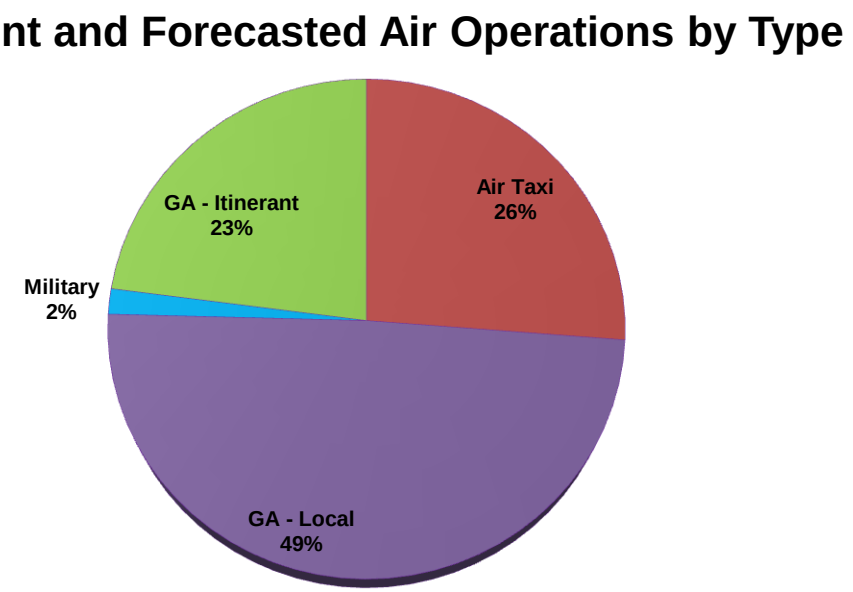


Figure 3-10 Current and Forecasted Aircraft Operations by Type

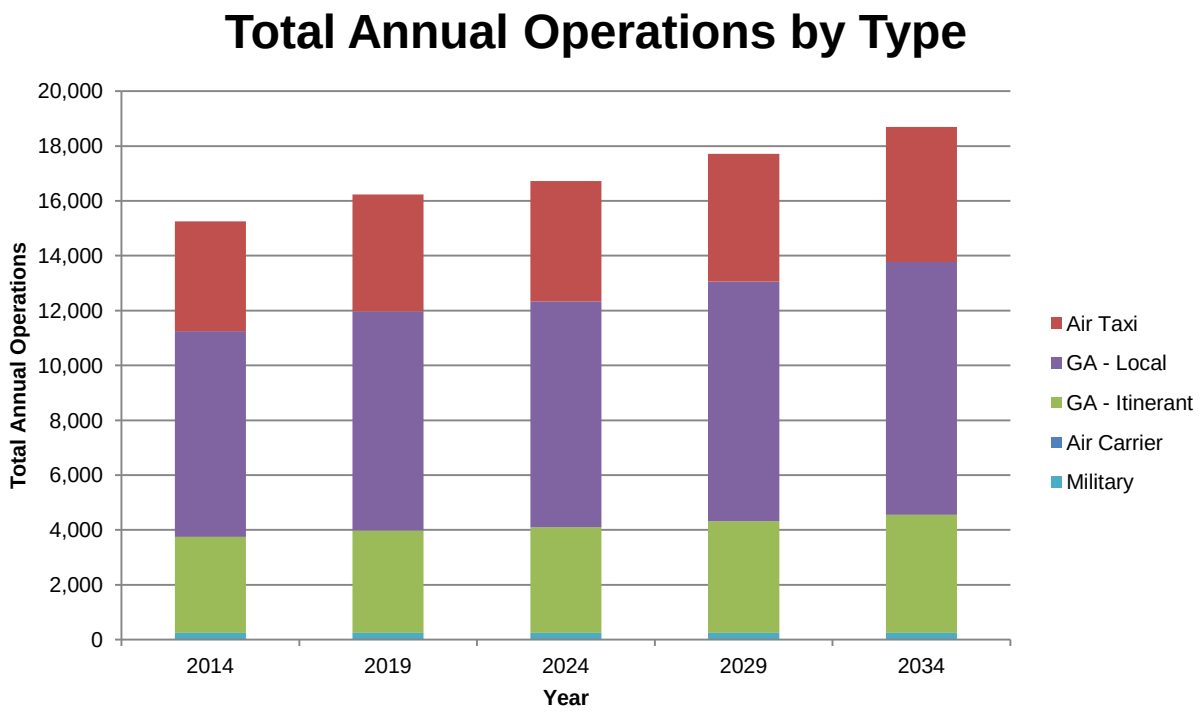


Figure 3-11 Total Annual Operations Forecast by Type

3.6 Airport Seasonal Use Determination

A seasonal fluctuation in aircraft operations can be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns and non-towered general aviation airports. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity.

Traffic at Canyonlands Field is heavily driven by visitors to the local area which tend to be in the spring and fall. Seasonal traffic estimates, determined by historical airport records, at Canyonlands Field are shown in **Figure 3-12.** The greatest peak months of total operations are May and September.

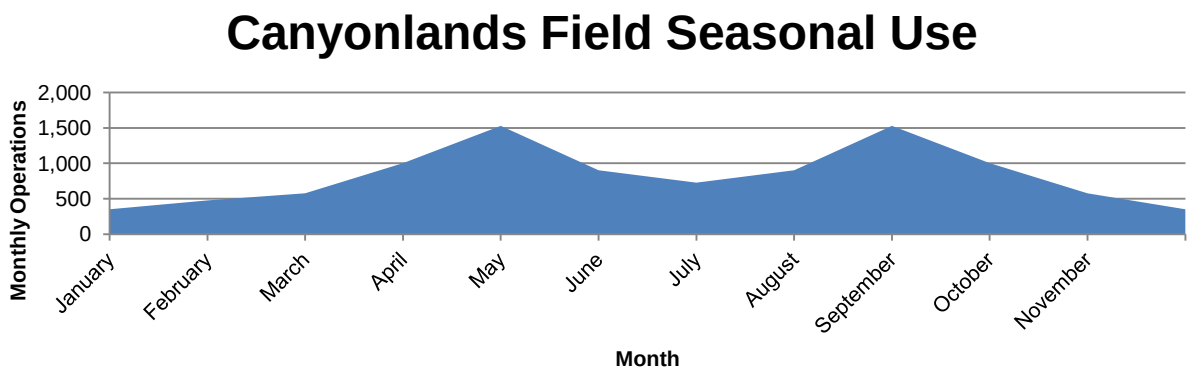


Figure 3-12 Canyonlands Field Seasonal Use

3.7 Hourly Demand and Peaking Tendencies

In order to arrive at a reasonable estimate of demand at the airport facilities, it was necessary to develop a method to calculate the levels of activity during peak periods. The periods normally used to determine peaking characteristics are defined below:

Peak Month: The calendar month when peak enplanements or operations occur.

Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.

Busy Day: The Busy Day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.

Design Hour: The peak hour within the Design Day. This descriptor is used in airfield demand/capacity analysis, as well as in determining terminal building, parking apron and access road requirements.

Busy Hour: The peak hour within the Busy Day. In this case, the Busy Hour is equal to the Design Hour.

Airport management recorded monthly operations from January 2008 to December 2014, which was used as a tool to determine the peaking characteristics for Canyonlands Field. Using the operation records, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve. The formula is as follows:

$$M = A (T / 100)$$
$$D = M / (365 / 12)$$

Where T = Monthly percent of use (from curve)
M = Average monthly operations
A = Total annual operations
D = Average Daily Operations in a given month

Approximately 90% of total daily operations occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, meaning the maximum peak hourly occurrence may be 50% greater than the average of the hourly operations calculated for this time period.

The Estimated Peak Hourly Demand (P) in a given month was, consequently, determined by compressing 90% of the Average Daily Operations (D) in a given month into the 12-hour peak use period, reducing that number to an hourly average for the peak use period and increasing the result by 50% as follows:

$$P = 1.5 (0.90D / 12)$$

Where D = Average Daily Operations in a given month.
P = Peak Hourly Demand in a given month.

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in **Table 3-11**. As is evident in **Table 3-11**, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the months of May and September (highlighted in bold), with an average of 95 daily operations and approximately 10.7 operations per hour in 2034.

Table 3-11 Estimated Monthly/Daily/Hourly Demand - Operations

Planning Year: 2019					Planning Year: 2024				
Operations: 16,234					Operations: 16,726				
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	3.53%	572	19	2.1	January	3.53%	590	19	2.2
February	4.79%	777	26	2.9	February	4.79%	801	26	3.0
March	5.81%	943	31	3.5	March	5.81%	971	32	3.6
April	10.10%	1,640	54	6.1	April	10.10%	1,689	56	6.2
May	**15.42%**	**2,504**	**82**	**9.3**	**May**	**15.42%**	**2,580**	**85**	**9.5**
June	9.09%	1,476	49	5.5	June	9.09%	1,521	50	5.6
July	7.32%	1,189	39	4.4	July	7.32%	1,225	40	4.5
August	9.09%	1,476	49	5.5	August	9.09%	1,521	50	5.6
September	**15.42%**	**2,504**	**82**	**9.3**	**September**	**15.42%**	**2,580**	**85**	**9.5**
October	10.10%	1,640	54	6.1	October	10.10%	1,689	56	6.2
November	5.80%	941	31	3.5	November	5.80%	970	32	3.6
December	3.53%	572	19	2.1	December	3.53%	590	19	2.2
Planning Year: 2029					Planning Year: 2034				
Operations: 17,710					Operations: 18,694				
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	3.53%	624	21	2.3	January	3.53%	659	22	2.4
February	4.79%	848	28	3.1	February	4.79%	895	29	3.3
March	5.81%	1,029	34	3.8	March	5.81%	1,086	36	4.0
April	10.10%	1,789	59	6.6	April	10.10%	1,888	62	7.0
May	**15.42%**	**2,732**	**90**	**10.1**	**May**	**15.42%**	**2,883**	**95**	**10.7**
June	9.09%	1,610	53	6.0	June	9.09%	1,699	56	6.3
July	7.32%	1,297	43	4.8	July	7.32%	1,369	45	5.1
August	9.09%	1,610	53	6.0	August	9.09%	1,699	56	6.3
September	**15.42%**	**2,732**	**90**	**10.1**	**September**	**15.42%**	**2,883**	**95**	**10.7**
October	10.10%	1,789	59	6.6	October	10.10%	1,888	62	7.0
November	5.80%	1,027	34	3.8	November	5.80%	1,084	36	4.0
December	3.53%	624	21	2.3	December	3.53%	659	22	2.4

Peak passenger enplanements were also calculated to determine the passenger terminal building holding capacity. The existing peak hour of enplanements was calculated using the total number of aircraft passenger seats available on the forecasted fleet mix anticipated to serve Canyonlands Field. The forecasted peak hour was determined by the percentage of the existing peak hour directly related to forecasted yearly enplanements. The estimated monthly, daily and hour passenger enplanement demand is shown in **Table 3-12**.

Table 3-12 Estimated Monthly/Daily/Hourly Demand – Passenger Enplanements

	2014	**2019**	**2024**	**2029**	**2034**
Yearly Enplanement	9,237	11,288	13,835	17,035	21,072
Peak Month	1,424	1,741	2,133	2,627	3,249
Peak Month Average Day	47	58	71	88	108
Peak Hour	39*	59**	85***	69***	85****

* Assumes Embraer 120 (30 Passenger Capacity) and Quest Kodiak (9 Passenger Capacity)

**Assumes Bombardier CRJ-200 (50 Passenger Capacity) and Quest Kodiak (9 Passenger Capacity)

***Assumes Bombardier CRJ-700 (60 Passenger Capacity) and Quest Kodiak (9 Passenger Capacity)

****Assumes Bombardier CRJ-900 or Embraer 175 (76 Passenger Capacity) and Quest Kodiak (9 Passenger Capacity)

3.8 Forecast Summary

Forecasts of activity were developed for based aircraft, annual operations, fleet mix and passenger enplanements at the airport. These forecasts represent low, average and high expected activity trends. The FAA TAF does not accurately reflect future total annual operations and based aircraft as it does not account for recent or anticipated growth at Canyonlands Field and the local community. It is assumed the impact of surrounding attractions and continued accessibility to air service will continually generate passenger enplanements and increase operations at the airport. For this reason, future passenger enplanements, based aircraft and total annual operations exceed the TAF by more than 10 percent. **Table 3-13** shows a summary of the preferred forecast for Canyonlands Field through the 20 year planning period.

Table 3-13 Forecast Summary

		2014	2019	2024	2029	2034
	Passenger Enplanements	9,237	11,288	13,835	17,035	21,072
	Based Aircraft	31	33	34	36	38
		Aircraft Operations				
Operations by Type	**Example Aircraft**			**Totals**		
Air Taxi and Scheduled Airline		**4,000**	**4,262**	**4,394**	**4,656**	**4,918**
Turboprop (B-II Regional Airliner)	Beechcraft 1900 Embrear 120	700	0	0	0	0
Regional Jet (C-II)	Bombardier CRJ-200/700 Embrear 140/145	0	746	0	0	0
Regional Jet or Turboprop (C-III)	Bombardier CRJ-900 Bombardier Q400	0	0	769	816	861
Turboprop	Beechcraft KingAir 200 Pilatus PC-12	1,485	1,582	1,631	1,728	1,826
Multi-Engine Piston	Cessna 402C Piper Conquest	330	354	363	380	406
Single-Engine Piston	Cessna 206 Cessna 210	825	880	906	962	1,014
Helicopter	Robinson R44 Eurocopter AS350	660	700	725	770	811
General Aviation		**11,000**	**11,722**	**12,082**	**12,804**	**13,526**
Corporate Jet	Cessna Citation X Gulfstream V	825	880	906	960	1,014
Turboprop	Cessna 208 Piper Meridian	1,650	1,758	1,812	1,921	2,029
Multi-Engine Piston	Beechcraft Baron Piper Seminole	1,100	1,172	1,208	1,280	1,354
Single-Engine Piston	Cessna 182 Piper Warrior III	6,875	7,326	7,552	8,003	8,453
Helicopter	Bell 412 Sikorsky S76	550	586	604	640	676
Military		**250**	**250**	**250**	**250**	**250**
Various	Beechcraft C-12 Sikorsky UH-60	250	250	250	250	250
	Total Annual Operations	**15,250**	**16,234**	**16,726**	**17,710**	**18,694**

Note: Projected fleet mix is an estimate and should be used for planning purposes only.

CHAPTER FOUR

FACILITY REQUIREMENTS

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER FOUR
FACILITY REQUIREMENTS

4.1 Introduction

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter Two, *Inventory*, and Chapter Three, *Forecasts of Aviation Demand*, are coupled with established planning criteria to determine future airport improvement needs.

The time frame for addressing development needs usually involves short-term (up to five years), medium-term (six to ten years) and long-term (eleven to twenty year) periods. Long range planning primarily focuses on the ultimate role of the airport and protects for post-planning period development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items and correction of design standard deficiencies.

4.2 Design Standards

The Runway Design Code (RDC) is a system established by the FAA to relate airport design criteria to the operational and physical characteristics of the aircraft that are currently operating and/or forecast to operate at the airport. The RDC has three primary components relating to airport design. The first component, depicted by letters A through E, is categorized by the design aircraft approach speed which determines the runway approach category (operational characteristic). The second component, depicted by Roman numerals I through VI, is categorized by either the design aircraft wingspan or tail height, utilizing the characteristic that places the aircraft in the highest design group (physical characteristic). The third component relates to the visibility minimums expressed by Runway Visual Range (RVR) values which are listed in feet (1,200, 1,600, 2,400, 4,000 and 5,000). If the airport does not have an instrument approach or visibility minimums greater than one statue mile, it is listed as VIS. In general, the approach category of the design aircraft drives the required design parameters for runway and runway facilities while the aircraft wingspan or tail height drives the required taxiway and taxilane separation criteria. **Table 4-1** has been included to provide a definition of both aircraft approach categories and aircraft design groups. Examples of each of these RDC are depicted in **Figure 4-1**.

To ensure that all airport facilities are designed to accommodate the expected air traffic, and to meet FAA criteria, the specific RDC for the runway must be determined. In order to designate a specific RDC for a runway, aircraft in that RDC should perform a minimum of 500 annual operations. The aircraft currently using the Canyonlands Field on a regular basis have a RDC of A-I, B-I, B-II and C-II.

The majority of business jet aircraft and very light jet aircraft which operate at Canyonlands Field fall into the B-I, C-I, B-II and C-II RDC. Commercial service aircraft currently operating at Canyonlands Field typically fall into the B-II RDC. The majority of commercial service aircraft

operating in the United States fall into the C-II to D-IV RDC. Airport users and fleet mix were discussed in the Chapter Three, *Forecasts of Aviation Demand*. Examples of aircraft with a RDC of A-I and B-I are listed in **Table 4-2**. Examples of aircraft with a RDC of A-II and B-II are listed in **Table 4-3**. Examples of aircraft with a RDC of C-II and D-II are listed in **Table 4-4**. Examples of aircraft with a RDC of C-III and D-III are listed in **Table 4-5**. Aircraft with a RDC of A-I through C-III are expected to utilize the airport in the short, medium and long-term time frames.

Table 4-1 Runway Design Code

Approach Category	Approach Speed	
Category A	less than 91 knots	
Category B	91 to 120 knots	
Category C	121 to 140 knots	
Category D	141 to 165 knots	
Category E	166 knots or more	
Design Group	**Wingspan**	**Tail Height**
Group I	< than 49 feet	< than 20 feet
Group II	49 to 78 feet	20 to 29 feet
Group III	79 to 117 feet	30 to 44 feet
Group IV	118 to 170 feet	45 to 59 feet
Group V	171 to 213 feet	60 to 65 feet
Group VI	214 to 261 feet	66 to 79 feet
RVR (ft)	**Flight Visibility Category (Statue Mile)**	
5,000	Not lower than 1 mile (APV > 1 mile)	
4,000	Lower than 1 mile but not lower than 3/4 mile (APV ≥ 3/4 but < 1 mile)	
2,400	Lower than 3/4 mile but not lower than 1/2 mile (CAT - I PA)	
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)	
1,200	Lower than 1/4 mile (CAT - III PA)	

Source: FAA AC 150/5300-13A*, Airport Design*

As discussed in Chapter Three, *Forecasts of Aviation Demand*, an emerging trend for regional airlines is a reduction in 30 to 50 passenger seat aircraft. Several major carriers and their regional affiliates have begun to reduce their fleet of the Embraer 120/140/145, Bombardier CRJ-200, DeHavilland Dash-8 and Saab 340 in favor of the larger Bombardier CRJ-700/900, Bombardier Q400 and Embraer 170/175. Destinations that are considered to be “capacity neutral” are less reliant on a higher frequency of flights with smaller aircraft and can be adequately served by a reduced schedule with larger aircraft. This allows the airline to transport an equal amount of passengers at a reduced cost. The fleet mix of commercial service aircraft at Canyonlands Field is anticipated to change along with industry trends.

With the recent retirement of SkyWest Airline’s Embraer 120, the C-II regional airline fleet mix has been identified for the short to medium-term time frame design aircraft for Canyonlands Field. With the understanding that the C-II regional airline fleet mix has been identified for retirement within the 20-year planning period, it is the fleet mix of aircraft anticipated to replace the Embraer 120 which currently serves Canyonlands Field in the short-term. With the anticipated retirement of the 50-

seat (C-II) regional airline fleet, the C-III regional airline fleet mix has been identified for the medium to long-term time frame design aircraft for Canyonlands Field.

This information indicates the fundamental development items for the short and medium-term will require a RDC upgrade to C-II for Runway 3-21. The long term will require an additional RDC upgrade to C-III for Runway 3-21. It is anticipated that operations by A-I through C-III aircraft will continue during the short, medium and long term.

Table 4-2 Example Aircraft Having a RDC of A-I or B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	9.1	6,200
Beech Bonanza V35B	70	33.5	6.6	3,400
Beech King Air B100	111	45.9	15.3	11,799
Cessna 150	55	33.3	8.0	1,670
Cessna 172	60	36.0	9.8	2,200
Cessna 177	64	35.5	8.5	2,500
Cessna 182	64	36.0	9.2	2,950
Cessna 340	92	38.1	12.2	5,990
Cessna 414	94	44.1	11.5	6,750
Cessna Citation I	108	47.1	14.3	11,850
Gates Learjet 28/29	120	42.2	12.3	15,000
Mitsubishi MU-2	119	39.1	13.8	10,800
Piper Archer II	86	35.0	7.4	2,500
Piper Cheyenne	110	47.6	17.0	12,050
Rockwell Sabre 40	120	44.4	16.0	18,650
Swearingen Merlin	105	46.3	16.7	12,500
Raytheon Beechjet	105	43.5	13.9	16,100
Eclipse 500 Jet	90	37.9	13.5	5,920

Source: FAA AC 150/5300-13A, *Airport Design* and Aircraft Manufacturer Performance Data

Table 4-3 Example Aircraft Having a RDC of A-II or B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	11.2	16,000
Beech King Air C90	100	50.3	14.2	9,650
Beech King Air 200	103	54.5	14.1	12,500
Beechcraft 1900	106	56.6	14.1	16,600
Cessna 441	100	49.3	13.1	9,925
Cessna Citation Bravo	112	52.2	15.0	14,800
Cessna Citation II	108	51.6	15.0	13,300
Cessna Citation III	114	50.6	16.8	17,000
Dassault Falcon 200	114	53.5	17.4	30,650
Dassault Falcon 50	113	61.9	22.9	37,480
Dassault Falcon 900	100	63.4	24.8	45,500
DHC-6 Twin Otter	75	65.0	19.5	12,500
Embrear 120	120	65.0	21.0	26,455
Fairchild Metro III	110	57.0	16.8	16,000
Grumman Gulfstream I	113	78.5	23.0	35,100
Pilatus PC-12	85	52.3	14.0	9,920
Saab 340	114	70.4	22.6	28,500

Source: FAA AC 150/5300-13A, *Airport Design* and Aircraft Manufacturer Performance Data

Table 4-4 Example Aircraft Having a RDC of C-II or D-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
1329 JetStar	132	54.5	20.4	43,750
Astra 1125	126	52.5	18.1	23,500
Bombardier CRJ-200	125	61.8	20.7	53,000
Cessna Citation 650	126	53.6	16.8	23,000
Cessna Citation 750 X	131	63.6	18.9	36,100
Embraer 135	130	65.8	22.2	41,887
Embraer 140	135	65.8	22.2	44,312
Embraer 145	135	65.8	22.2	48,501
Falcon 900 EX	126	63.5	24.2	48,300
Gulfstream-II	141	68.8	24.5	65,300
Gulfstream-III	136	77.8	24.4	68,700
Gulfstream-IV	145	77.8	24.4	71,780
Hawker 125-1000	130	61.9	17.1	36,000
Rockwell 980	121	52.1	14.9	10,325

Source: FAA AC 150/5300-13A, *Airport Design* and Aircraft Manufacturer Performance Data

Table 4-5 Example Aircraft Having a RDC of C-III or D-III

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Airbus A319	138	111.9	39.7	166,449
Airbus A320	136	111.9	39.6	171,961
Boeing 717-200	139	93.2	29.8	121,000
Boeing 737-700	130	112.5	41.7	154,500
Boeing 737-800	142	117.5	41.2	174,200
Bombardier CRJ-700	135	76.3	24.1	75,000
Bombardier CRJ-900	142	81.7	24.1	84,500
Bombardier Q400	129	93.3	27.4	65,200
Embraer 170	124	85.3	32.3	79,344
Embraer 175	124	85.3	31.9	82,673
Gulfstream G550	140	93.5	25.8	85,100
MDC MD-83	144	107.9	30.2	160,000
MDC MD-90	138	107.9	31.2	156,000

Source: FAA AC 150/5300-13A, *Airport Design* and Aircraft Manufacturer Performance Data

A-I*	Primarily single-engine piston aircraft, some light multi-engine aircraft	Cessna 172	Diamond DA40
B-I*	Primarily light multi-engine piston aircraft, some very light jets	Cessna 402C	Cessna Citation Mustang
B-II*	Light turboprops, small commuter airliners, and mid-sized corporate jets	Embraer 120	Pilatus PC-12
C/D-I	Primarily small and fast corporate jets	Learjet 45	Learjet 60
C/D-II	Large corporate jets and small regional jets (≥ 50 seats)	Bombardier CRJ-200	Gulfstream IV
C/D-III	Large regional airliner jets and small commercial airliners (approx. 76-200 seats)	Bombardier CRJ-900	Boeing 737
C/D-IV	Medium to large commercial airliners (approx. 200-350 seats)	Airbus A330	Boeing 767
D-V or greater	Very large commercial airliners (approx. 350+ seats)	Airbus A380	Boeing 747

*If aircraft MTOW is less than 12,500 lbs., it is considered "small."

Figure 4-1 Aircraft Characteristics Diagram

4.3 Airfield Capacity

The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*.

Advisory Circular 150/5060-5 was used to calculate the ASV for a single runway airport with the forecasted operation levels determined in Chapter Two, *Forecasts of Aviation Demand*. Based on the Advisory Circular, the ASV for the existing and future runway configuration and fleet mix is 230,000 operations per year. The current operations account for approximately four percent of the airport's ASV. The forecasted operations account for eight percent of the airport's ASV. Under these conditions, the existing runway configuration will adequately meet the demand within the time frame of this study. **Table 4-6** summarizes the projected ASV within the planning period.

Table 4-6 Annual Service Volume Summary

Year	Annual Operations	Annual Service Volume	Annual Capacity Ratio
2014	15,250	230,000	6.63%
2019	16,234	230,000	7.06%
2024	16,726	230,000	7.27%
2029	17,710	230,000	7.70%
2034	18,694	230,000	8.13%

Source: Armstrong Consultants, 2014

4.4 Airside Facility Requirements

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids.

4.4.1 Runway Requirements

Runway Length: FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length requirements. The information required to determine the recommended runway lengths includes, airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. The following information for Canyonlands Field was used for the analysis:

Field Elevation: 4,557 feet MSL
Mean Maximum Temperature of Hottest Month: 98.2^{o} F
Effective Gradient: 10 Feet

The process to determine recommended runway lengths for a selected list of critical design airplanes begins with determining the weights of the critical aircraft that are expected to use the airport on a regular basis. For aircraft weighing 60,000 pounds or less, the runway length is determined by family groupings of aircraft having similar performance characteristics. The first family grouping is identified as small airplanes, which is defined by the FAA as airplanes weighing 12,500 pounds or less at Maximum Takeoff Weight (MTOW). The second family grouping is identified as large airplanes, which is defined by the FAA as airplanes exceeding 12,500 pounds but weigh less than 60,000 pounds. Aircraft weighing more than 60,000 pounds are classified as an individual large airplane. The required runway length is determined by aircraft-specific length requirements. **Table 4-7** shows the aircraft families defined by the FAA.

Table 4-7 Airplane Weight Categorization for Runway Length Requirements

Airplane Weight Category Maximum MTOW			Design Approach
≤ 12,500 Pounds	Approach Speed < 30 knots		Family groupings of small airplanes
	Approach Speed ≥ 30 knots, but < 50 knots		Family groupings of small airplanes
	Approach Speed ≥ 50 knots	With < 10 Passengers	Family groupings of small airplanes
		With ≥ 10 Passengers	Family grouping of small airplanes
Over 12,500 pounds, but < 60,000 pounds			Family groupings of large airplanes
≥ 60,000 pounds or more, or Regional Jets			Individual large airplane

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*
Note: All regional jets, regardless of their MTOW, are assigned to the 60,000 pounds or more weight category

Recommended runway lengths to serve large aircraft weighing over 60,000 pounds are determined using a certain percentage of the useful load. According to the AC, 75 percent of fleet at 60 and 90 percent useful load requires runway lengths of 6,850 and 8,700 feet respectively. The AC shows 100 percent of fleet at 60 and 90 percent useful load requires a runway length of 11,100 feet. **Table 4-8** provides the recommended runway length information based on FAA runway length requirements for general groups of aircraft weight classifications. **Figure 4-2** provides takeoff distance requirements for specific aircraft.

Recommended runway lengths are determined using charts in FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, based on the seating capacity and the mean daily maximum temperature of the hottest month of the year at the airport. The existing runway length of Runway 3-21 can accommodate 100 percent of all small aircraft weighing less than 12,500 pounds. Large aircraft weighing over 60,000 pounds typically will be weight restricted as the length of Runway 3-21 is unable to accommodate 75 percent of planes at 90 percent useful load. The term useful load, as defined by the FAA, is the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil and unusable fuel.

Table 4-8 Recommended Runway Length

Description	Runway Length
Existing Runway Length	7,100’
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.,< 10 passenger)	
75 percent of these small airplanes	4,490’
95 percent of these small airplanes	5,920’
100 percent of these small airplanes	6,180’
Large Aircraft (≥60,000 lbs.)	
75 percent of these planes at 60 percent useful load	6,850’
75 percent of these planes at 90 percent useful load	8,700’
100 percent of these planes at 60 percent useful load	11,100’
100 percent of these planes at 90 percent useful load	11,100’

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Takeoff Distance Requirements: When determining runway length requirements for an airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. **Figure 4-2** provides examples of takeoff distance requirements for some of the aircraft currently using and projected to utilize Canyonlands Field.

The takeoff distance requirements for commercial service aircraft will vary depending on the stage length the aircraft will be travelling. Typically, a commercial service aircraft will carry less fuel if it is operating to a destination at a distance less than the maximum range. With less fuel on board, the takeoff distance can be reduced from the requirement for an aircraft at MTOW. While the Bombardier CRJ-200/700/900, Bombardier Q400 and Embraer ERJ-170/175 at MTOW require a runway length greater than provided at Canyonlands Field, the two aircraft can operate at full useful load with a reduced range. According to Bombardier performance data, the CRJ-200/CRJ-700/CRJ-900, Q400 and ERJ-170/175 could reach destinations such as Denver, Colorado; Phoenix, Arizona; and Salt Lake City, Utah when operating from Canyonlands Field.

The conditions at Canyonlands Field include a relatively high elevation above MSL, high temperatures and relatively flat runway gradients. The existing field conditions degrade aircraft performance including increased takeoff and landing distances. However, factoring in typical stage lengths for the future and ultimate design aircraft, the existing Runway 3-21 length is considered to be adequate for the planning period.

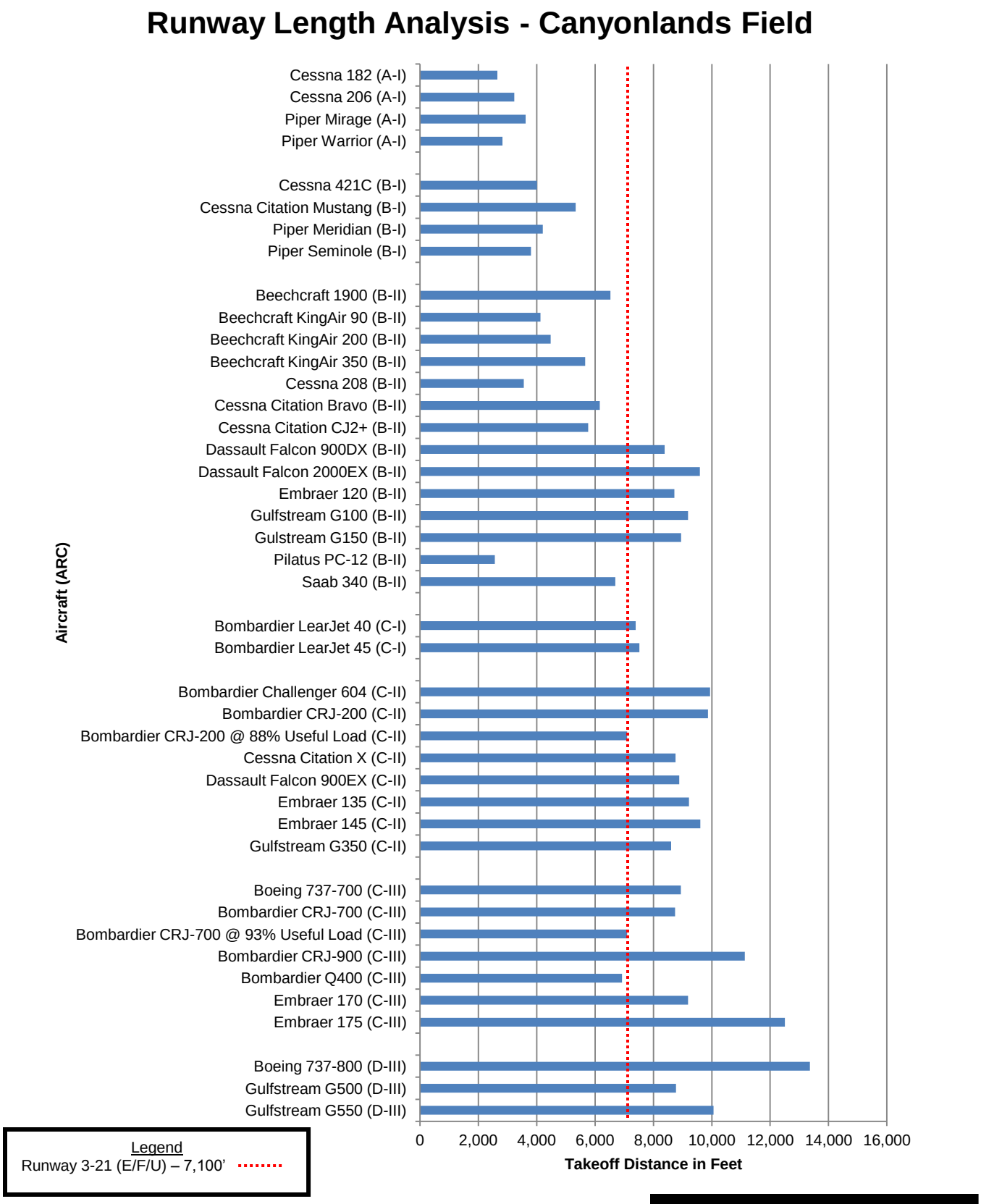


Figure 4-2 Runway Length Analysis

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing strength of Runway 3-21 is 25,000 pounds Single Wheel Gear (SWG). The future C-II regional airline fleet mix design aircraft, weigh 45,000 to 55,000 pounds. The ultimate C-III regional airline fleet mix design aircraft, weigh 75,000 to 85,000 pounds. Therefore, the existing pavement strength is not considered adequate in the short, intermediate or long term. It is recommended to strengthen Runway 3-21 to accommodate 55,000 pounds Dual Wheel Gear (DWG) in the short term. It is recommended to further strengthen Runway 3-21 to accommodate 75,000 pounds DWG in the long term.

FAA design standards for runways serving aircraft having a RDC B-II with visibility minimums of ¾-mile or greater require a minimum runway width of 75 feet. Runway 3-21 is 75 feet wide and therefore meets the standard. FAA design standards for runways serving aircraft with RDC C-II or RDC C-III with a MTOW less than 150,000 pounds require a minimum runway width of 100 feet. It is recommended to widen Runway 3-21 to a width of 100 feet to accommodate both the future and ultimate design aircraft.

Runway Surface: Runway surfaces for commercial service airports are typically constructed of either asphalt or concrete. Asphalt is a mixture of sand or gravel combined with bituminous liquid, which is a more flexible pavement type. An asphalt constructed runway has a typical useful life of 15 to 20 years. Concrete is a mixture of broken stone, sand, cement and water to form a more rigid pavement type. A runway constructed of concrete has a typical useful life of 20 to 40 years. In most cases, concrete runways have a higher initial cost to construct versus asphalt runways. Runway 3-21 is constructed of asphalt pavement with a Porous Friction Course (PFC). A PFC is designed to allow water to run off the runway surface without affecting aircraft braking action. The existing runway surface is considered to be adequate for the planning period. During future runway rehabilitation, reconstruction or strengthening projects, the PFC should be replaced with grooving to assist with pavement drainage. It is also recommended to construct blast pads on each runway end to prevent the potential of soil erosion of the RSA due to the forecasted increase in jet-powered aircraft.

4.4.2 Crosswind Coverage

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate RDC, then a crosswind runway should be considered. Hourly wind data collected by the National Oceanic and Atmospheric Administration (NOAA) Climate Data Center from the automated surface observation system (ASOS) located at the airport indicates that Runway 3-21 provides more than 95 percent wind coverage for aircraft in ARC A-I through C-III. The seasonal wind coverage was also evaluated to ensure adequate wind coverage. The wind coverage for Runway 3-21 at 10.5 knots is 92.72 percent, 95.50 percent for 13 knots and 98.07 percent for 16 knots. The wind coverage for Canyonlands Field is depicted in **Figure 2-31**. If financially feasible, it is recommended to construct a crosswind runway to RDC B-I design standards to accommodate A/B-I aircraft when winds do not favor Runway 3-21. Also, the

crosswind runway would allow smaller aircraft to operate during closures of Runway 3-21 for construction or maintenance which would enhance the utility of the airport. Depending on cost and funding availability, the crosswind runway could be a turf, gravel or compacted dirt surface.

4.4.3 Taxiway Requirements

Length and Width: The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency.

Runway 3-21 is served by one partial parallel taxiway with seven entrance/exit taxiways. Taxiway A is a partial parallel taxiway located along the southside of Runway 3-21. The taxiway is 35 feet wide and is located 300 feet from runway centerline to taxiway centerline and therefore exceeds the standards for RDC B-II. Taxiway A is shown in **Figure 4-3**. The 35 foot wide taxiway provides adequate Taxiway Edge Safety Margins on the straightaway for future C-II regional airline fleet design aircraft in the short to medium-term time frame; however the taxiway fillets should be widened to keep the main gear track on pavement during turns. It is recommended to provide 400 feet of separation and a taxiway width of 50 feet to accommodate the ultimate C-III regional airline fleet design aircraft during the medium to long-term time frame. **Table 4-9** lists the existing, future and ultimate design standards for runway to taxiway centerline separations. **Table 4-10** lists the existing, future and ultimate design standards for taxiway width.

Figure 4-3 Taxiway A

Strength: The strength of the taxiway should be maintained at a strength equal to that of the associated runway pavement.

Table 4-9 Existing and Recommended Runway to Taxiway Centerline Separations

Term	RDC	Visibility Minimums	Runway to Taxiway Centerline Separation	
			Standard	Actual/Recommended
Existing	B-II	Visual to Not Lower than ¾-Mile	240’	300’
Future	C-II	Visual to Not Lower than ¾-Mile	300’	300’
Ultimate	C-III	Visual to Lower than ¾-Mile	400’	400’

Table 4-10 Existing and Recommended Taxiway Widths

Term	TDG	Taxiway Width	
		Standard	Actual/Recommended
Existing	2	35’	35’
Future	3	50’	35’ on straight-aways with 50’ TDG 3 widened fillets
Ultimate	3	50’	50’

4.4.4 Aircraft Apron

The apron space requirements as shown in this planning document were developed according to recommendations given in AC 150/5300-13A, *Airport Design*. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport, including turboprops and jets.

General Aviation Apron and Helicopter Parking Pads:
Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not hangared. Apron size and tiedown requirements for the 20-year planning period are listed in **Table 4-9**. The current tiedown layout is based on TDG 1 and 2 taxilane OFAs. The future apron layout should be planned to provide for TDG 1, 2 and 3 taxilane OFAs. Typically large aircraft, including business jets, are not tied down and can usually occupy multiple tiedown spaces.

Helicopter parking pads are marked areas of pavement designed specifically to accommodate the outdoor storage of helicopters not in use. Designated parking pads are utilized to provide safe distances between ground personnel and other objects. A helicopter parking pad is not intended to be used for the takeoff or landing of helicopters. Based on existing and forecasted helicopter activity, it is anticipated that helicopters will continue to hover over the taxiway centerline to the runway for departure or arrival at the airport. The helicopter parking pad differs from a heliport which is designed to provide clear approach and departure paths, area for ground maneuvers, a Final Approach and Takeoff Area (FATO), Touchdown and Liftoff Area (TLOF), safety area and wind cone. Helicopter parking pad requirements and square yardages are listed in **Table 4-11**. The future design helicopter will be the Bell 412.

The general aviation apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. It is assumed that 100 percent of based helicopters will be stored in conventional hangars. The general aviation apron should also allow approximately 36 yards per transient helicopter parking. This square yardage would provide adequate space for circulation and rotor diameter. Canyonlands Field

should plan for additional apron expansion and extension of taxilanes to hangar development areas.

Table 4-11 General Aviation Apron and Helicopter Parking Pad Requirements

Apron Requirements	2014	2019	2024	2029	2034
Single and Multi Engine Aircraft Area (S.Y.)	9,900	10,800	11,400	12,900	14,700
Itinerant Aircraft Area (S.Y.)	24,025	26,365	29,065	32,233	36,013
Total General Aviation Apron (S.Y.)	**33,925**	**37,165**	**40,465**	**45,133**	**50,713**
Tiedowns (Based Aircraft)	3	4	4	5	6
Tiedowns (Itinerant Aircraft)	26	27	29	30	32
Hardstands for Turboprops and Corporate AC	0	0	1	1	2
Total Tiedowns and Hardstands	**29**	**31**	**34**	**36**	**40**
Helicopter Parking Pads	0	1	1	1	1
Helicopter Parking Area (S.Y.)	0	36	36	36	36

Source: Armstrong Consultants, 2014

Commercial Service Apron:

The commercial service apron should be able to accommodate the projected types and volume of commercial service aircraft that are anticipated to use the airport during the planning period. The commercial service apron needs to provide adequate space for the movement of baggage carts, fuel trucks and other aircraft service equipment. The commercial service apron should accommodate adequate spacing to conduct deicing operations. The airliners utilizing Canyonlands Field are able to park in front of the terminal building and utilize air stairs for loading and unloading; once the aircraft is loaded the airplane is able to turn around on its own power without requiring a push back from an aircraft tug. This type of loading and unloading is preferred by the airlines to help reduce the turnaround time at the gate and ground support equipment required to push back the aircraft.

Additional commercial service apron space is recommended to accommodate increased passenger service along with meeting the requirements of the peak hourly demand, simultaneous parking and increasing aircraft size. Additional apron space should be planned to accommodate irregular operations which may exceed peak hourly demand. Areas for additional commercial apron space will be further evaluated in Chapter Five, *Development Alternatives*. **Table 4-12** summarizes the commercial service apron requirements for the 20-year planning period. The existing commercial service apron is depicted in **Figure 4-4**.

Figure 4-4 Commercial Service Apron

Table 4-12 Commercial Service Apron Requirements

Year	Number of Aircraft Parking Positions	Fleet Mix	Square Yardage Required
2014	1	1 x Embraer 120	820
2019	2	2 x C-II Regional Airline Fleet Mix	3,130-3,250
2024	2	2 x C-III Regional Airline Fleet Mix	3,770-4,375
2029	2	2 x C-III Regional Airline Fleet Mix	3,770-4,375
2034	2	2 x C-III Regional Airline Fleet Mix	3,770-4,375

Source: Armstrong Consultants, 2014

4.4.5 Navigational Aids

A Navigational Aid (NAVAID) is any visual or electronic device used to provide course or altitude information to pilots. NAVAID include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples.

The MOAB VOR is the only ground based NAVAIDs at Canyonlands Field. The existing VOR is located on the airfield to the southwest of the aircraft parking apron and is equipped with Distance Measuring Equipment. The existing ground based NAVAIDs are considered to be adequate for the planning period. No additional NAVAIDs are recommended.

4.4.6 Instrument Approach Procedures

The current approach procedures at Canyonlands Field include a Global Positioning System (GPS) approach to Runways 3 and a circling VOR approach to the airport. A circling approach is considered to be a visual approach. It is recommended to develop a Localizer Performance with Vertical Navigation (LPV) GPS approach to Runway 21 with 1-Mile visibility minimums to increase the utility of the airport and enhance aviation safety during periods of low visibility or night time. It is recommended in the short-term to bury the existing power lines located along U.S. Highway 191 northeast of the Runway 21 threshold to clear the future approach surface. Existing instrument approach procedures are depicted in **Figures 2-16** and **2-17**.

4.4.7 Airfield Lighting, Signage, Marking and Visual Aids

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in Chapter Two, *Inventory*. Airfield lighting at Canyonlands Field consists of Medium Intensity Runway Lights (MIRL's) on Runway 3-21. Taxiway A and associated entrance/exit taxiways are lighted with Medium Intensity Taxiway Lights (MITLs). Existing visual aids include a segmented circle, tetrahedron, lighted wind cone and rotating airport beacon. Precision Approach Path Indicators (PAPIs) and Runway End Identifier Lights (REILs) are located on the ends of Runways 3 and 21.

The existing lighting and visual aids are considered to be adequate for the planning period. The taxiway edge lights are currently in poor condition and are scheduled for replacement in 2015. Apron, taxiway and runway markings should be remarked as necessary throughout the planning period. Lighting and signage should be adequately maintained until they have reached the end of their useful life at which they should be replaced. It is recommended to replace the lighting with Light Emitting Diodes (LED) for energy conservation purposes.

4.5 Landside Facility Requirements

Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenues for the airport.

4.5.1 Terminal Building

The existing passenger terminal at Canyonlands Field is a single-level building located in the east portion of the Airport property. The terminal building has a total square footage of approximately 4,500 square feet. The terminal building has undergone several renovations including the most recent in 2013. Overall the existing terminal building is in good condition. The building has been well maintained and the areas within the terminal building are neat and clean. The following recommendations focus on the condition, configuration and capacity of the specific facilities or areas at the time they were reviewed during the inventory. As shown in **Table 4-13**, modifications, additions and equipment upgrades will be necessary during the planning period to maintain an efficient terminal building and accommodate passenger demand. The existing terminal building floor plan layout is depicted in **Figure 2-24**.

The following terminal building facilities were reviewed:

- Baggage Claim
- Airline Ticket Counters
- Baggage Security Screening and Processing
- Transportation Security Administration (TSA) Passenger Screening Checkpoint
- Passenger Boarding Gate and Aircraft Parking Positions
- Restrooms
- Restaurant and Concessions
- Circulation

4.5.1.1 Minimum Facility Size

Based on the preceding analysis, the existing passenger terminal building size is approximately 4,500 square feet. FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations,* recommends the minimum facility size be between

6,000 to 8,000 square feet. It is recommended to expand the passenger terminal building to a minimum of 6,000 to 8,000 square feet, as further described in the following sections.

4.5.1.2 Baggage Claim

There is no existing baggage claim area located in the passenger terminal building at Canyonlands Field. Currently, passengers retrieve all checked luggage from a manually operated cart on the aircraft parking apron adjacent to the arriving aircraft. The existing system requires people to wait in an open area exposed to the natural elements, which reduces the overall passenger experience. It is recommended to expand the passenger terminal building to accommodate a baggage claim area. The baggage claim area should be approximately 800 square feet with one baggage carousel measuring approximately 50 linear feet to accommodate the forecasted peak hour passenger demand. It is also recommended to integrate exit lane breach control technologies to the one-way door from the commercial service apron to baggage claim/non-sterile waiting area. This will provide the passenger with an enhanced experience, greater impression of the local area and minimize the risk of harm from passengers waiting for luggage outside.

4.5.1.3 Airline Ticket Counter

The two airline ticket counters are located in the western portion of the terminal building. Redtail Aviation operates one airline ticket counter for air tours. Great Lakes Airlines operates one airline ticket counter for scheduled passenger services as shown in **Figure 4-5**. For planning purposes, only counters serving scheduled passenger services will be analyzed.

Great Lakes Airlines has two employee staffed check-in positions, one baggage drop and two self check-in kiosks. The airline occupies approximately 11 linear foot of counter frontage. The ticket counter and combined office space equals approximately 363 square feet. Additionally, Great Lakes Airlines has approximately 177 square feet for passenger queuing.

FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, recommends 1,000 square feet and 2,100 square feet for an airline counter and office to accommodate the existing and future peak hour passenger demand, respectively. The airline ticket counter length should also be extended to an overall length of 20 feet to accommodate the future peak hour passenger demand. The FAA also recommends for passenger queuing a total area of 200 square feet and 400 square feet to accommodate the existing and future peak hour passenger demand, respectively. It is also recommended to add one additional self check-in kiosk once aircraft with a capacity larger than 50 seats begin operating at Canyonlands Field.

The addition of new technology has been helping to reduce the amount of ticket counters needed by airlines by including the use of automated check-in kiosks at Canyonlands Field. Airlines have been trying to reduce the amount of space as much as possible to reduce cost. Airlines have been allowing the use of mobile phone integrated boarding passes which may further reduce the necessity of airline ticket counter space. Prior to future design of an expanded passenger terminal building, it is prudent to evaluate existing trends in passenger processing technology to ensure the most optimal use of space.

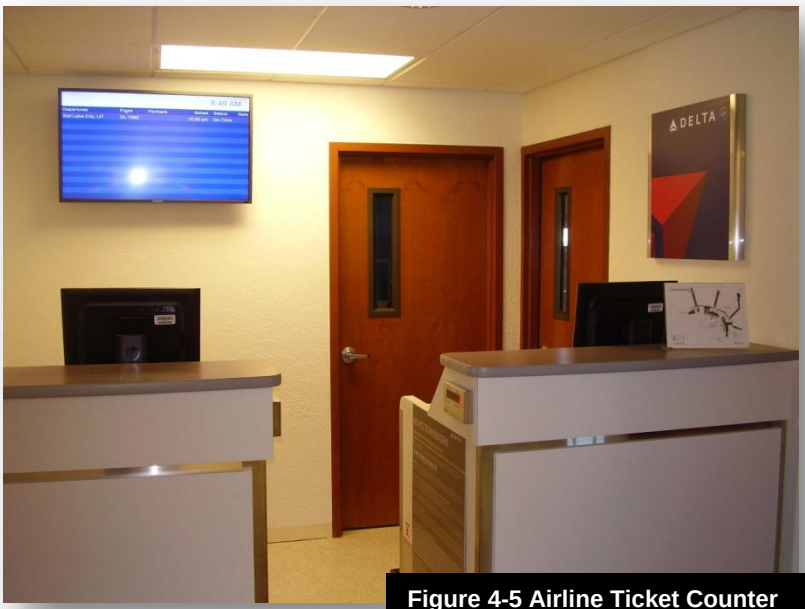


Figure 4-5 Airline Ticket Counter

It is also recommended to transition the current airline ticket counters from individual airline leaseholders to a Common Use Terminal Equipment (CUTE) system. A CUTE system is a method of converting brick and mortar branding of ticketing and gate counters to digital technology. This system allows multiple airlines to share the ticketing and gate counters. By utilizing digital signage, the CUTE system would allow greater flexibility for new entrant or charter carriers to Moab. Currently, several airlines and airports are collaborating for a transition to a Common Use Passenger Processing System (CUPPS) which will provide a uniform technological platform for passenger processing between airlines and will utilize existing CUTE systems. An example of a CUTE system is depicted in **Figure 4-6**.

Figure 4-6 CUTE System Example

Source: Passenger Terminal Today

4.5.1.4 Baggage Security Screening and Processing

Baggage screening currently takes place adjacent to the Great Lakes Airlines office and ticket counter. The existing checked baggage security screening and processing is all conducted in the one room which is approximately 250 square feet in size. It is recommended to segregate security screening and airline processing into two separate areas. Using forecasted enplanements and projections for checked luggage, it is recommended expand the passenger terminal building to accommodate a 940 square foot security screening area and a 900 square

foot baggage processing area. The increased size of the baggage screening area should enhance efficiency of the baggage screening process.

4.5.1.5 TSA Passenger Screening Checkpoint

TSA passenger screening begins in the western portion of the passenger terminal building adjacent to the Great Lakes Airlines passenger queuing area. Doors divide the sterile potion and the non-sterile portion of the terminal building. Passenger screening occurs in a single linear checkpoint through the doors at the entry to the sterile passenger lounge. The checkpoint area is approximately 420 square feet. Arriving passengers disembark the sterile portion of the terminal through one-way doors which provide direct access to the lobby area. The existing TSA screening area is considered to be adequate for the existing peak hour passenger demand. It is recommended to expand the TSA screening area to approximately 690 square feet in size to accommodate the forecasted peak hour passenger demand. Additional space is recommended for the screening checkpoint to facilitate potential modifications to security screening procedures. Further consultation with the TSA is recommended prior to design of an enhanced or expanded passenger screening checkpoint.

4.5.1.6 Passenger Boarding Gate and Aircraft Parking Positions

The airport has one departure gate located on the western boundary of the passenger terminal building. The gate provides direct access to the commercial service apron. The passenger boarding gate is approximately 440 square feet, has one customer service podium, one boarding door and seating for approximately 15 passengers. Of the 440 square foot area, approximately 285 square feet consists of seating (and associated clearances) and the customer service podium. Additionally, the standing area and boarding corridor are not separated which creates a less efficient boarding process. There is one aircraft parking position. The existing passenger boarding gate is shown in **Figure 4-7**.

Figure 4-7 Passenger Boarding Gate

The majority of passengers traveling at Canyonlands Field currently wait for their departing flight in the main lobby area. It is recommended to increase the passenger boarding gate area to 1,320 square feet. The size would provide square footage for approximately 53 seats, 130 square feet for standing, one customer service podium and approximately 320 square feet for a boarding corridor. The area would adequately serve a 76 passenger aircraft and would also rate as “Excellent” Level of Service per the International Air Transportation Association (IATA) *Guidelines for Airport Capacity/Demand Management*. It is also recommended to add one

aircraft parking position on the apron to accommodate any irregular operations or larger charter aircraft, as discussed in **Section 4.4.4**.

4.5.1.7 Restrooms

Public restrooms are available in the eastern wing of the terminal building. It is recommended to add additional sterile public restrooms to the passenger boarding gate are as future expansions occur.

4.5.1.8 Restaurant and Concessions

The terminal has three vending machines serving a variety of food and beverages in the main lobby. FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, recommends additional space for full-service food and beverage providers. It is recommended to allocate approximately 600 square feet during future terminal expansions to accommodate a snack bar, lounge, coffee shop or restaurant.

4.5.1.9 Circulation

The majority of passenger circulation in the passenger terminal building occurs in the main lobby area and an entry vestibule located along the east boundary of the airport. There is approximately 1,670 square feet available for circulation. FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations,* recommends that approximately 30 percent of the terminal building size be allocated to circulation. It is recommended once a terminal building expansion occurs, that 30 percent of the building size is dedicated to circulation.

4.5.2 Terminal Building Capacity Analysis

As passenger activity increases the need for additional space to accommodate those users will be needed. This section provides information on the current capacity of the terminal building and provides spatial recommendations for the planning period. Currently, congestion frequently occurs during peak hour operations in the non-sterile waiting area/baggage claim or the TSA Passenger Screening Checkpoint and adjacent lobby area depending on if passengers are arriving or departing. This analysis identifies the deficient areas and the recommended space allocations.

FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, notes that information contained within the document provides general guidelines and approximations for determining spaces and terminal facility requirements for planning purposes. It is not intended they be used to replace detailed architectural or engineering analysis necessary for the specific design of individual airport terminal facilities. The square footage recommendations in **Table 4-13** are for planning purposes only. Further detailed analysis is recommended prior to actual design. The recommended square footage

was based on the peak hourly passenger demand and annual enplanements for each time period. A more detailed terminal analysis is recommended in the short-term to determine optimum terminal location and configuration.

Table 4-13 Passenger Terminal Building Capacity Analysis

Facility	Unit of Measurement	Existing Condition	Accommodating Existing B-II Enplanements	Accommodating Future C-II Enplanements	Accommodating Ultimate C-III Enplanements
Baggage Claim					
Baggage Claim	Square Foot	0	600	600	800
Baggage Claim Frontage	Linear Foot	0	20	32	50
Airline Counter and Administration					
Airline Queuing	Square Foot	177	200	300	400
Check-In Kiosks	Per Unit	2	2	2	3
Airline Counter/Office	Square Foot	363	1,000	1,500	2,100
Airline Ticket Counter Length	Linear Foot	11	11	15	20
Passenger and Baggage Screening					
TSA Passenger Screening	Square Foot	420	420	455	690
TSA Passenger Lane	Per Unit	1	1	1	1
TSA Baggage Screening	Square Foot	253	940	940	940
TSA Administrative Offices	Square Foot	258	258	258	258
Baggage Processing	Square Foot	0	900	900	900
Passenger Boarding Area and Gates					
Number of Passenger Gates	Per Unit	1	1	1	1
Aircraft Parking Positions	Per Unit	1	2	2	2
Airline Passenger Gates	Square Foot	440	700	870	1,320
Circulation and Miscellaneous Facilities					
Restrooms	Square Foot	380	760	760	760
Rental Car Facilities	Square Foot	101	101	101	101
Restaurant and Concessions	Square Foot	45	200	600	600
Circulation	Square Foot	1,670	1,670	2,400	2,400
Maintenance Storage	Square Foot	245	245	245	245
Vehicle Parking					
Short-Term Parking	Per Unit	7	7	7	13
Employee Parking	Per Unit	5	5	5	5
Rental Car Parking	Per Unit	0	20	20	20
Total Parking	Per Unit	31	50	50	75
Minimum Facility Size					
Passenger Terminal Building Size	Square Foot	4,500	6,000*	6,000 – 8,000*	8,000*

Source: FAA AC 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations,* ACRP Report 25, *Airport Passenger Terminal Planning and Design, Volume 2* and Armstrong Consultants, Inc.
*Note: Sizes are for planning purposes only and are not a sum of the table's recommendations

4.5.3 Terminal Building Environmental Considerations

It is recommended to upgrade several terminal building features to reduce the environmental footprint of the building. High-efficiency windows should be retrofitted to minimize the required heating required and provide greater insulation. Restroom fixtures such as sinks and toilets should be upgraded to reduce water consumption. The use of solar energy, in accordance with the FAA's *Interim Solar Glare Policy*, should also be evaluated as an alternative power source for the terminal building. The applications of these recommendations serve to reduce the airport's environmental footprint and provide several long-term savings for utility expenses.

4.5.4 Hangar Facilities

Hangars are typically classified as either T-hangars, (small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit) or conventional box hangars, (small to very large units) which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to the size of the aircraft and building. Hangars at Canyonlands Field consist of 11 conventional hangars. Examples of the existing hangar facilities are depicted in **Figure 2-29**.

Based Aircraft Hangar Requirements: The facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars and number of conventional type hangars required for the future. Development areas will be identified on the ALP for a mix of T-hangars, box hangars and larger corporate style hangars.

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected (such as hail or snow) or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage or a heated hangar in the winter. Additional transient hangar space, which is typically provided by the FBO, is recommended during the planning period.

4.5.5 Aviation Fuel Facilities

Redtail Aviation provides fuel service at Canyonlands Field. Redtail Aviation has one 12,000 gallon above ground Jet-A storage tank and one 12,000 gallon above ground 100LL storage tank. All tanks are single wall within secondary containment areas. Redtail also operates a Jet-A dispensing fuel truck and a 100LL dispensing fuel truck. The fuel available at Redtail Aviation is full service and self-serve. The existing 100LL fuel facilities are considered adequate for the planning period. It is recommended to install one additional 12,000 gallon above ground Jet-A fuel storage tank.

4.5.6 Utilities

Available utilities at Canyonlands Field include power, water, sewer, gas, phone and internet. The electricity is provided by Rocky Mountain Power and natural gas is provided by Questar Gas. Telephone and internet services are provided by Emory Telecom. All facilities utilize on-site wells for water, septic systems and on-site waste water ponds.

Canyonlands Field is currently in the process of upgrading their electrical connection. The existing number of site wells is considered to be deficient for existing and recommended development. It is recommended to construct one additional site well for water. It is also recommended to extend additional utilities as to new development areas future airside and landside development occurs.

4.5.7 Airport Access and Vehicle Parking

Canyonlands Field can be reached by vehicle by following U.S. Highway 191 north from downtown Moab or the south from Interstate 70. The airport is located approximately 18 miles north of downtown Moab. A high visibility airport entrance sign has been installed at the intersection of Aviation Way and U.S. Highway 191. Aviation Way is in good condition. Improvements to the road are recommended including widening to provide increased traffic circulation and flow. There are 31 paved public automobile parking spaces available for airport employees, users, visitors and rental car companies. An additional unpaved overflow parking lot is located adjacent of the terminal building. The terminal building parking lot serves both short and long-term users. The airport does not charge users of the terminal building parking lot.

Automobile parking projections were developed for the 20 year planning period. FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, was used to determine the number of required future public automobile parking spaces. Based on the forecasted number of enplanements approximately 50 parking spaces are recommended. It is recommended to accommodate forecasted airport user demand by increasing the public automobile parking spaces to 50 spaces in the short to medium-term and 75 spaces in the long-term. It is also recommended to increase the automobile parking spaces for GA users as future hangar development is constructed.

4.5.8 Fencing

The airport is currently fenced with a five-strand barbed wire with a mesh guard which follows the existing airport property line. The terminal area is surrounded by a seven foot chain-link fence. The primary purpose of this fencing is to restrict inadvertent and unauthorized access to the airport by wildlife and persons. It is recommended to replace the existing perimeter fence with an eight-foot tall wildlife fence when the fence-lines are realigned or when the existing fence exceeds its useful life.

4.5.9 Aircraft Rescue and Fire Fighting (ARFF) Station and Equipment

Canyonlands Field is required to meet an ARFF response requirements based on the current role of the airport. The ARFF Index is determined by the length of the largest air carrier aircraft which serves the airport with an average of five daily departures. A detailed list of the requirements for ARFF Indexes A through C is listed in **Table 4-14**. The airport is currently classified as a FAR Part 139 Class III Index A airport. Index A is categorized as five or more departures of aircraft with a capacity greater than nine seats and an aircraft length of less than 90 feet. However, the airport meets the requirements of FAR Part 139 Class I Index B airport based on existing equipment. Canyonlands Field currently operates one truck dedicated for ARFF purposes, a Striker 1500, manufactured by the Oshkosh Corporation in 2011. The ARFF station was also constructed in 2011. The existing ARFF Station and truck are in good condition and considered to be adequate for the planning period. As the role of the airport

changes and airline fleet mix changes it is recommended that the requirements are kept up to date and equipment acquired as necessary. The existing ARFF station is depicted in **Figure 2-31** and the existing ARFF truck is depicted in **Figure 2-32**.

Table 4-14 ARFF Requirements

Index	Aircraft Length	Vehicle and Extinguishing Agent Requirements
A	Less than 90 ft	One Vehicle carrying the following: Once vehicle carrying at least 500 pounds of sodium based dry chemical, halon 1211, or clean agent, or One vehicle carrying 450 pounds of potassium based dry chemical and water with a commensurate quantity of ARFF to total 100 gallons.
B	At least 90 ft but less than 126 ft	Either of the following: One vehicle carrying at least 500 pounds of sodium based dry chemical or halon 1211 and 1,500 gallons of water and the commensurate quantity of AFFF for foam production Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons
C	At Least 126 but less than 159 ft	Either of the following: Three vehicles: One carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index B; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons Each ARFF vehicle used to comply with Index B and C requirements with a capacity of at least 500 gallons, but less than 2,000 gallons shall be equipped with a turret. Vehicle turret discharge rate should be at least 500 gallons per minute but less than 1,000 gallons per minute. Required discharge capacity for dry chemical through a handline is 5 lbs/sec; and 16 lbs/sec through a turret.

Source: 14 CFR Part 139

4.5.10 Airport Maintenance Equipment and Storage

The existing equipment storage building is co-located with the ARFF Station and houses a variety of Snow Removal Equipment (SRE) and airfield maintenance vehicles. The existing airport maintenance building and equipment is in good condition and is considered to be adequate for the planning period.

4.5.11 Non-Aeronautical Revenue Generation

Currently, non-aeronautical revenue generating activities at Canyonlands Field include car rental companies and vehicle storage garages. Other types of non-aeronautical revenue generation could include but are not limited to: retail, concessions, hotels, industrial development, car rentals, corporate business parks, solar power, and limited agricultural use which would not conflict with airport land use compatibility. It is prudent to protect areas for non-aeronautical revenue generation to assist the airport in achieving economic sustainability. Areas appropriate for non-aeronautical uses will be identified on the Airport Layout Plan. Non-aeronautical revenue generating activities do not need direct access to the airfield. Any release

of land for non-aeronautical purposes must be coordinated through the Federal Aviation Administration's Denver Airport District Office.

4.5.12 Weather Reporting Services

Canyonlands Field is currently served by an Automated Surface Observing System (ASOS). The ASOS is good condition and is considered to be adequate for the planning period.

4.6 Land Use Compatibility and Control

4.6.1 Airport Property

Existing airport property encompasses approximately 985 acres of land. Land located within the Runway Protection Zones are currently controlled through fee simple ownership and avigation easements. U.S. Highway 191 runs through the Runway 21 approach RPZ and Runway 3 departure RPZ. Blue Hills Road runs through the Runway 3 approach RPZ and Runway 21 departure RPZ. The current RPZ land uses are considered to be compatible with the airport.

4.6.2 Compatibility with State/Regional Plans

Upgrading the runway to RDC C-II and C-III will increase the size of protective design standard surfaces, such as the ROFA and RPZs. Depending on the selected preferred development alternative, additional land acquisition may be needed. This will be further evaluated in Chapter Five, *Development Alternatives*. Future state and regional transportation plans should be coordinated with the Canyonlands Field Airport Master Plan to ensure conformance. The Airport Master Plan Update for Canyonlands Field is compatible with existing, state, regional and local plans.

4.6.3 Zoning and Land Use

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the 14 CFR Part 77 Airspace Surfaces (described in the following section). The FAA, therefore, recommends that the County implement height restrictions in the vicinity of the airport to protect these Part 77 Surfaces. Canyonlands Field is located within the Grand County Airport Limitation District. The zoning ordinance states there is a 35 foot height restriction within the Airport Limitation District unless otherwise noted on the Airport Layout Plan. Additionally, the airport may enforce additional design standards to protect airport property and surrounding airspace. Upon evaluation of each Grand County zoning classifications Canyonlands Field, either appropriate building height restrictions or measures to ensure compatible development adjacent to the airport are utilized. It is recommended Grand County continuously update the Airport Limitation District based on existing and future airport configuration to further protect the Airport from any future adjacent incompatible development.

In addition to ensuring that obstructions to Part 77 Surfaces are avoided or appropriately marked and lighted, it is recommended that the County make reasonable efforts to prevent incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment plants should also be located this same distance from any point on the runway. According to FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, recycling centers which accept non-food items are considered to be an acceptable land use. The nearest landfill is located in excess of 10,000 feet from the runway surfaces. High density residential development within approach and departure corridors can also be a concern. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

4.7 Part 77 Airspace Surfaces

14 CFR Part 77 establishes several imaginary surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation activities. A graphical depiction of Part 77 surfaces are depicted in **Figure 4-8**. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight or less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight or less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure. A precision instrument larger than utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure with visibility minimums lower than ¾-mile. Runways with only “circling” instrument approaches are considered “visual” for Part 77 purposes.

Canyonlands Field currently has a GPS approach to Runway 3. Runway 3 is currently considered a larger than utility nonprecision instrument runway. Runways 3 and 21 are served by a circling VOR approach, which is considered to be visual, therefore Runway 21 is currently considered a larger than utility visual runway. The existing and future Part 77 Airspace Surfaces for Runway 3-21 is listed in **Table 4-15**. The Part 77 Airspace Surfaces for these classifications are described in the following paragraphs. While it is desirable to eliminate penetrations of Part 77 airspace surfaces, in some cases, penetrations (also known as

obstructions) may be mitigated with appropriate marking and/or lighting. A detailed obstruction analysis is included as a part of the Airport Master Plan and will be indentified on the Airport Layout Plan drawing set.

4.7.1 Primary Surface

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. The Primary Surface extends 200 feet beyond each end of the paved runway surface, but begins at the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on pavement strength, type of approach and approach visibility minimums.

4.7.2 Approach Surface

The Approach Surface is a surface longitudinally centered on the extended runway centerline that extends outward and upward from each end of the associated runway's Primary Surface. An Approach Surface is applied to each runway end and has a slope of 20:1, 34:1 or 50:1 based upon the type of approach that is available or planned for that runway. Approach surfaces extend upward depending on the type of approach available. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the Part 77 runway classification criteria.

4.7.3 Transitional Surface

The Transitional Surfaces extend outward and upward at right angles from the runway centerline and sides of the Primary and Approach Surfaces at a slope of 7:1 ending at the Horizontal Surface.

4.7.4 Horizontal Surface

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of a specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

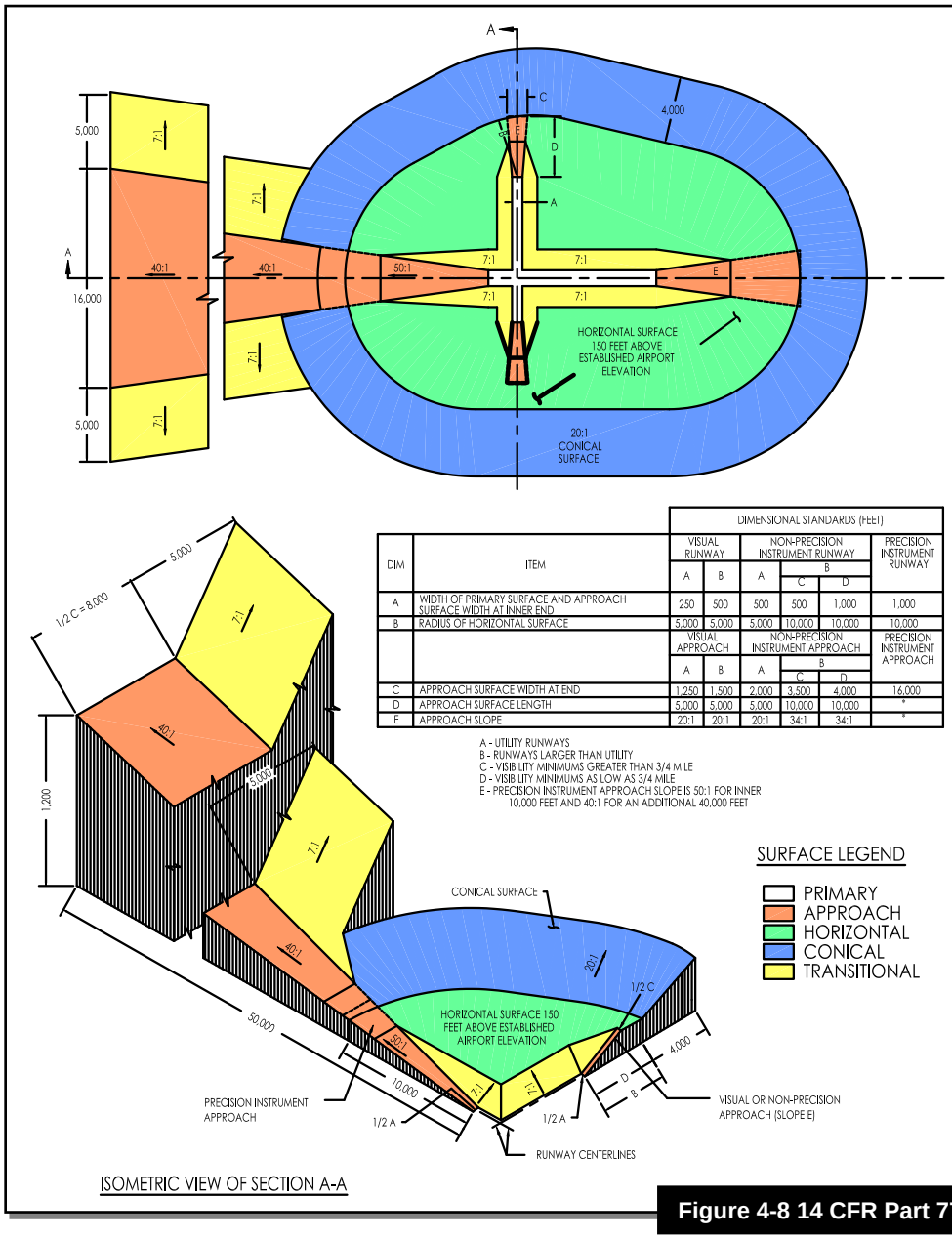
4.7.5 Conical Surface

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

Table 4-15 Existing, Future and Ultimate Part 77 Surfaces – Runway 3-21

	Existing	Future	Ultimate
Runway 3	NPI > Utility	NPI > Utility	NPI > Utility
Runway 21	Visual > Utility	Visual > Utility	NPI > Utility
Primary Surface width	500’	500’	500’
Primary Surface beyond RW end	200’	200’	200’
Approach Surface dimensions	RW 3: 500’ x 3,500’ x 10,000’ RW 21: 500’ x 1,500’ x 5,000’	RW 3: 500’ x 3,500’ x 10,000’ RW 21: 500’ x 1,500’ x 5,000’	RW 3: 500’ x 3,500’ x 10,000’ RW 21: 500’ x 3,500’ x 10,000’
Approach Surface slope	RW 3: 34:1 RW 21: 20:1	RW 3: 34:1 RW 21: 20:1	RW 3: 34:1 RW 21: 34:1
Transitional Surface slope	7:1	7:1	7:1

Source: 14 CFR Part 77



DIM	ITEM	VISUAL RUNWAY A	VISUAL RUNWAY B	NON-PRECISION INSTRUMENT RUNWAY A	NON-PRECISION INSTRUMENT RUNWAY B C	NON-PRECISION INSTRUMENT RUNWAY B D	PRECISION INSTRUMENT RUNWAY
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH A	VISUAL APPROACH B	NON-PRECISION INSTRUMENT APPROACH A	NON-PRECISION INSTRUMENT APPROACH B C	NON-PRECISION INSTRUMENT APPROACH B D	PRECISION INSTRUMENT APPROACH
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Figure 4-8 14 CFR Part 77 Surfaces

4.8 Summary of Facility Requirements and FAA Design Standards

In summary, the facility requirements for Canyonlands Field are based on the types and volume of aircraft expected to use the airport in the short, intermediate and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in **Table 4-16**. The recommended FAA design standards, detailed in the Chapter Two, *Inventory*, for Runway 3-21 are listed in **Table 4-17**.

Table 4-16 Summary of Airport Facility Requirements

Facility		Existing	Future	Ultimate
Runway 3-21	Runway 3 Runway Design Code	B-II-5000	C-II-5000	C-III-5000
	Runway 21 Runway Design Code	B-II-VIS	C-II-VIS	C-III-5000
	Length (feet)	7,100’	7,100’	7,100’
	Width (feet)	75’	100’	100’
	Strength (pounds)	25,000 lbs. SWG	55,000 lbs. DWG	85,000 lbs. DWG
Marking	Runway 3	Non-Precision	Non-Precision	Non-Precision
	Runway 21	Non-Precision	Non-Precision	Non-Precision
Taxiways				
	Aircraft Design Group	ADG II	ADG II	ADG III
	Taxiway Design Group	TDG 2	TDG 3	TDG 3
	Taxiway Configuration	Partial Parallel	Partial Parallel	Parallel
	Width (feet)	35’	50’	50’
Apron				
	Tie Downs & Hard Stands	29	34**	40**
	Total Apron Area	34,400 SY**	43,331 SY**	55,088 SY**
NAVAIDs				
	Approaches	VOR-A and GPS	VOR-A and GPS	VOR-A and GPS
	Lowest Visibility Minimums	1-mile	1-mile	1-mile
Lighting & Visual Aids				
	Signs	Lighted	Lighted	Lighted
	Runway Edge	MIRL	MIRL	MIRL
	Taxiway/Apron Edge	MITL	MITL	MITL
	Threshold Lights	Yes	Yes	Yes
	REILs	Yes	Yes	Yes
	Approach Slope Indicator (PAPI)	Yes	Yes	Yes
	Segmented Circle/Wind Cone	Yes	Yes	Yes
	Rotating Beacon	Yes	Yes	Yes
Landside Facilities				
	Terminal Building	4,500 SF	6,000 SF**	8,000 SF**
	Paved Parking Spaces	31	50**	75**
	Hangars	11	15**	20**
	100 LL AvGas	12,000 Gallon	12,000 Gallon	12,000 Gallon
	Jet-A	12,000 Gallon	24,000 Gallon**	24,000 Gallon**
	Terminal Area Fencing	7’ Chain Link	7’ Chain Link	7’ Chain Link
	Perimeter Fencing	5-Strand Wire	8’ - Wildlife Fence	8’ - Wildlife Fence
	ARFF Index	A (B Actual)	A (B Actual)	A (B Actual)
	Weather Reporting Station	ASOS	ASOS	ASOS

**As required based on actual demand.

Table 4-17 Existing and Future Airfield Design Standards

	Existing	Future	Ultimate
Runway	**3-21**	**3-21**	**3-21**
Runway Design Code	B-II-5000	C-II-5000	C-III-5000
Approach Visibility Minimums	1-Mile	1-Mile	1-Mile
Line of Sight Requirements Met	Yes	Yes	Yes
RW Length	7,100’	7,100’	7,100’
RW Width	75’	100’	100’
RW Shoulder width	10’	20’	20’
RW Safety Area width	150’	500’	500’
RW Safety Area length prior to threshold	300’	600’	600’
RW Safety Area length beyond departure end	300’	1,000’	1,000’
RW Object Free Area width	500’	800’	800’
RW Object Free Area length prior to threshold	300’	600’	600’
RW Object Free Area length beyond runway end	300’	1,000’	1,000’
Obstacle Free Zone width	400’	400’	400’
Obstacle Free Zone length beyond runway end	200’	200’	200’
Runway Protection Zone	500’ x 1,000’ x 700’	500’ x 1,700’ x 1,010’	500’ x 1,700’ x 1,010’
Blast Pad length	None	150’	200’
Blast Pad width	None	120’	140’
RW Centerline to taxiway/taxilane centerline	240’ (300’ Actual)	300’	400’
RW Centerline to aircraft parking area	250’ (400’ Actual)	400’	500’
Taxiway Design Group	**2**	**3**	**3**
Aircraft Design Group	II	II	III
TW Width	35’	50’	50’
TW Safety Free Area width	79’	79’	118’
TW Object Free Area width	131’	131’	186’
TW Centerline to Parallel TL Centerline	105’	105’	152’
TL Object Free Area width	115’	115’	162’

Source: FAA AC 150/5300-13A, *Airport Design*

CHAPTER FIVE

DEVELOPMENT ALTERNATIVES

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER FIVE
DEVELOPMENT ALTERNATIVES

5.1 Introduction

While there are theoretically a broad range of options and variations for each aspect of airport development, an organized approach to identifying and evaluating alternatives that reasonably meet future aviation demand and a community's strategic goals and objectives is essential for effective airport master planning. The preceding chapters have established the projected activity levels at Canyonlands Field and identified facilities that will be needed to accommodate growth for the 20-year planning horizon. Determining the best options for achieving airside and landside development needs will allow the Airport to invest in long-term capital infrastructure.

Included herein is a comprehensive breakdown of alternatives and recommended development options for airside and landside improvements. Airside alternatives primarily focus on upgrading the Airport Reference Code (ARC), strengthening Runway 3-21, constructing a crosswind runway and accommodating aircraft movement on the aircraft parking apron. Landside development will focus on the passenger terminal building.

5.2 Development Objectives

The overall objectives of the alternatives analysis are to 1) define a path for future development that is capable of accommodating the forecast demand and facility needs of the airport and 2) evaluate the best way to implement the facility requirements as presented in Chapter Four, *Facility Requirements*.

There is countless variety for potential development options for any particular airport. The selection of a favored approach to a project can often result from a straightforward and logical discussion of the options at hand.

A combination of effective airside planning is critical to successful development. Airside facilities are those used during takeoff, landing and ground maneuvering of aircraft. Landside facilities generally support aircraft after they exit the runway and park, and typically consist of a system of hangars, fixed base operator (FBO), passenger terminal buildings, fuel systems, airport maintenance and support facilities, vehicle parking areas, utility infrastructure and revenue generating areas.

5.3 Airside Development Alternatives

Chapter Four, *Facility Requirements*, discussed the necessity to upgrade the ARC to C-II due to recent fleet mix changes in the regional airline industry. Based on the forecasted fleet mix at Canyonlands Field, accommodating C-II aircraft will be justified within the short-term (Phase I). The medium to long-term goal of Canyonlands Field is for the airport to meet C-III design standards with a runway length of 7,100 feet. Based on the forecasted fleet mix at Canyonlands Field, accommodating C-III aircraft is expected to be justified within the medium to long-term (Phase II). The method of accommodating a C-III ARC depends on the selection of a preferred alternative for the C-II ARC upgrade. The objectives Canyonlands Field needs to achieve in order to accommodate a C-II and C-III ARC are listed below.

C-II ARC Upgrade Objectives (Phase I)

- Runway Width: 100 feet
- Runway Safety and Object Free Area: 1,000 foot length beyond runway ends
- Runway Object Free Area: 800 foot width along Runway 3-21
- Runway Safety Area: 500 foot width along Runway 3-21
- Pavement Strength: 55,000 pounds Dual Wheel Gear (DWG)
- Taxiway Design Group: 3 (to greatest extent practicable)
- Runway Centerline to Taxiway Centerline Separation: 300 feet (minimum)

C-III ARC Upgrade Objectives (Phase II)

- Pavement Strength: 85,000 pounds DWG
- Runway Centerline to Taxiway Centerline Separation: 400 feet

5.3.1 C-II ARC Upgrade (Short-Term)

Alternatives 1 through 4 evaluate the accommodation of the C-II ARC upgrade. **Table 5-1** provides a brief description and estimated cost of each C-II ARC upgrade alternative. Each alternative is graphically depicted at the end of this Chapter.

Table 5-1 C-II ARC Upgrade Alternatives

Alternative	Description	Estimated Cost
1	Use of displaced thresholds	$9,300,000
2	Shift Runway 3-21 260 feet to the southwest	$10,750,000
3	Construct replacement runway	$26,200,000
4	Shift Runway 3-21 204 feet to the northeast	Not Calculated
5	No Action	$0

Note: All cost estimates use 2015 dollars and are for planning purposes only

C-II ARC Upgrade Alternative 1: Use of Displaced Thresholds

Alternative 1 would widen the existing Runway 3-21 from 75 feet to 100 feet. Alternative 1 would also displace the Runway 3 threshold by 204 feet and the Runway 21 threshold by 252 feet to accommodate both the Runway Safety Area (RSA) and Runway Object

Free Area (ROFA) beyond the runway ends on existing airport property. Runway 3-21 would be strengthened to 55,000 pounds DWG during the C-II ARC Upgrade. The entrance/exit taxiways fillets would be widened to 50 feet for TDG 3 while the remaining portions of the taxiway would be kept at 35 feet wide. Blast pads would also be constructed on each runway end.

Estimated Phase I Cost: $9,250,000

The major advantages to this alternative are:

- Accommodates the future C-II regional airline design aircraft
- Increases Runway 3-21 pavement strength
- Reduced cost of development
- Reduced impact on surrounding land uses
- Less potential for environmental impacts
- No land acquisition required beyond the runway ends
- Avoids impacting the wash located southwest of the Runway 3 threshold

The major disadvantages to this alternative are:

- Would require the use of declared distances (see below)
- Reduces usable runway length
- Requires the closure of Runway 3-21 during construction
- Requires the relocation of Blue Hills Road and adjacent gas line

<u>Declared Distances</u>

According to the FAA, declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff and landing performance requirements. Each distance is treated independently and may vary for each operational direction. The definitions of each declared distance are as follows:

- Takeoff Run Available (TORA): The runway length available for the takeoff run.
- Takeoff Distance Available (TODA): The TORA distance combined with a clearway length, if available.
- Accelerate Stop Distance Available (ASDA): The declared distance for a rejected takeoff which is the TORA distance combined with a stopway length, if available.
- Landing Distance Available (LDA): The runway length available for a landing aircraft.

C-II ARC Upgrade Alternative 2: Shift Runway 3-21 260' to the Southwest

Alternative 2 would widen the existing Runway 3-21 from 75 feet to 100 feet. Alternative 2 would also shift Runway 3-21 by 260 feet to the southwest to clear U.S. Highway 191 from the RSA and ROFA, acquire approximately two acres of Bureau of Land Management land and realign Blue Hills Road, the fence and a wash located along the western boundary of the future airport property. The shift would accommodate both the 1,000 foot RSA and ROFA beyond the runway ends. Runway 3-21 would be

strengthened to 55,000 pounds DWG. The entrance/exit taxiways fillets would be widened for Taxiway Design Group (TDG) 3 while the remaining portions of the taxiway would be kept at 35 feet wide. Blast pads would also be constructed on each runway end.

Estimated Phase I Cost: $10,750,000

The major advantages to this alternative are:

- Accommodates the future C-II regional airline design aircraft
- Increases Runway 3-21 pavement strength
- Avoids impacts U.S. Highway 191
- Provides 7,100 feet of runway length

The major disadvantages to this alternative are:

- Higher potential for environmental impact
- Would require the realignment of Blue Hills Road and adjacent gas line and wash
- Would require the realignment of fence
- Increased development time to complete and accommodate C-II traffic
- Requires acquisition of ± two acres of BLM land for RSA and ROFA length and width
- Requires the closure of runway during construction

C-II ARC Upgrade Alternative 3: Construct Replacement Runway

Alternative 3 would construct a new Runway 3-21 located 400 feet to the northwest of the existing Runway 3-21. The runway would be 7,100 feet long by 100 feet wide, meet ARC C-II design standards and have ARC C-III runway centerline to taxiway centerline separation. The runway would be constructed to a strength of 55,000 pounds DWG initially. Blast pads would also be constructed on each runway end. The existing Runway 3-21 would be converted to a taxiway and the existing Taxiway A could be kept or removed. According to FAA Advisory Circular 150/5300-13A, *Airport Design*, public roads must be excluded from the Runway Protection Zone (RPZ). Existing runways are exempt from adhering to the aforementioned requirement. As Alternative 3 would construct a new runway, this would require the realignment of Blue Hills Road to accommodate the Future Runway 21 Departure/Runway 3 Approach RPZ.

Estimated Phase I Cost: $26,200,000

The major advantages to this alternative are:

- Accommodates the future C-II regional airline design aircraft
- Increases Runway 3-21 pavement strength
- Would reduce or eliminate runway closure time during construction
- Would accommodate ARC C-III setbacks for the long-term airport configuration

The major disadvantages to this alternative are:

- Requires acquisition of ± 15 acres of Bureau of Land Management land for the RSA, ROFA and ROFZ length and width
- Would have the greatest comparative environmental impact
- Would move runway closer to higher terrain
- Would require the relocation of the ASOS
- Requires higher funding in the short-term
- Increased development time to complete and accommodate C-II traffic
- Highest development costs to meet C-II design standards

C-II ARC Upgrade Alternative 4: Shift Runway 3-21 204' to the Northeast

Alternative 4 would widen the existing Runway 3-21 from 75 feet to 100 feet. Alternative 4 would also shift Runway 3-21 204 feet to the northeast to clear Blue Hills Road and realign U.S. Highway 191. In doing so, the shift would accommodate both the 1,000 foot RSA and ROFA beyond the runway ends. Runway 3-21 would be strengthened to 55,000 pounds DWG. The entrance/exit taxiways fillets would be widened for Taxiway Design Group (TDG) 3 while the remaining portions of the taxiway would be kept at 35 feet wide. Blast pads would also be added to each runway end. Relocating U.S. Highway 191 is not considered to be financially, physically or environmentally feasible. Thus, Alternative 4 will not be carried forward for further analysis

No cost estimate was developed due to the lack of feasibility of this alternative.

C-II ARC Upgrade Alternative 5: No Action

Alternative 5 is the no action alternative. Under this alternative, Runway 3-21 would remain B-II. This alternative would not widen Runway 3-21 to a width of 100 feet, increase the pavement strength or provide 1,000 foot RSA/ROFA at each runway end to accommodate ARC C-II Design Standards.

The major advantages to this alternative are:

- Provides 7,100 feet of runway length
- Would not require the use of declared distances
- Requires no federal or local investment
- No potential environmental impacts
- No runway closures
- Requires no construction or adjustment to existing airport layout configuration

The major disadvantages to this alternative are:

- Does not accommodate design standards for ARC C-II
- Airport would be unable to accommodate future C-II regional airline aircraft
- Negative economic impacts from constrained development
- Does not increase Runway 3-21 pavement strength
- Inconsistent with the County plans for the airport

5.3.2 C-III ARC Upgrade (Medium to Long-Term)

The following describes the required action to accommodate a C-III ARC upgrade based on the initial alternative selected. Each required action is graphically depicted at the end of this Chapter. **Table 5-2** provides a brief description and estimated cost of each C-III ARC upgrade required action.

Table 5-2 C-III ARC Upgrade Required Action

C-II Alternative	Description	Estimated Cost
1	Shift Runway 3-21 260 feet to the southwest. Shift Taxiway A 100 feet to the south.	$18,300,000
2	Shift Taxiway A 100 feet to the south.	$17,700,000
3	Construct blast pads.	$400,000

Note: All cost estimates use 2015 dollars and are for planning purposes only

C-III ARC Upgrade Based on Alternative 1: Shift Runway 3-21 260' to the Southwest and Taxiway A 100' to the South

Runway 3-21 would be shifted by 260 feet to the west to accommodate the RSA and ROFA beyond the runway ends. The displaced thresholds would also be removed. To accommodate the runway shift, Blue Hills Road would be realigned. Runway 3-21 would further be strengthened to 85,000 pounds DWG and Taxiway A would be relocated to the south to accommodate a 400 foot runway to taxiway separation. Taxiway A would also be increased in width to 50 feet to accommodate Taxiway Design Group (TDG) 3. This alternative would require approximately 108,000 cubic yards of fill material for the taxiway and Taxiway Safety Area (TSA) grading.

Estimated Phase II Cost: $18,300,000

C-III ARC Upgrade Based on Alternative 2: Shift Taxiway A 100' to the South

Runway 3-21 would further be strengthened to 85,000 pounds DWG and Taxiway A would be relocated to the south to accommodate a 400 foot runway to taxiway separation. Taxiway A would also be increased in width to 50 feet to accommodate Taxiway Design Group (TDG) 3. This alternative would require approximately 108,000 cubic yards of fill material for the taxiway and Taxiway Safety Area (TSA) grading.

Estimated Phase II Cost: $17,700,000

C-III ARC Upgrade Based on Alternative 3: Construct Blast Pads

The blast pads would need to be expanded to a length of 200 feet and a width of 140 feet. No other action would be required as all other C-III ARC setbacks would be existing.

Estimated Phase II Cost: $400,000

Cost Estimates for C-II and C-III ARC Upgrades

A summary of the cost estimates for Alternatives 1 through 3 are included in **Table 5-3**. Alternatives 4 and 5 were omitted from cost estimates as Alternative 4 is not considered feasible and Alternative 5 does not require any funding.

Table 5-3 C-II and C-III ARC Upgrade Cost Estimates

C-II Alternative	Phase	Total Cost	Federal Cost	State Cost	Local Cost
1	I	$9,300,000	$8,835,000	$232,500	$232,500
	II	$18,300,000	$17,385,000	$457,500	$457,500
	I and II	**$27,600,000**	**$26,220,000**	**$690,000**	**$690,000**
2	I	$10,750,000	$10,212,500	$268,750	$268,750
	II	$17,700,000	$16,815,000	$442,500	$442,500
	I and II	**$28,450,000**	**$27,027,500**	**$711,250**	**$711,250**
3	I	$26,200,000	$24,890,000	$655,000	$655,000
	II	$400,000	$380,000	$10,000	$10,000
	I and II	**$26,600,000**	**$25,270,000**	**$665,000**	**$665,000**

Note: All cost estimates use 2015 dollars and are for planning purposes only

5.3.3 Crosswind Runway

Canyonlands Field does not currently meet the 95 percent crosswind coverage for A/B-I aircraft. This limits the operations of smaller single-engine aircraft during periods when the wind does not align with Runway 3-21. Crosswind Runway Alternatives 1 through 3 will evaluate the options of developing a crosswind runway at Canyonlands Field and are depicted at the end of this Chapter. Both Alternative 1 and 2 would utilize the remnant surface of the old Runway 15-33 which was closed in 1985. **Table 5-4** provides a brief description and estimated cost of each crosswind runway alternative.

Table 5-4 Crosswind Runway Alternatives

Alternative	Description	Estimated Cost
1	North crosswind runway	$650,000
2	South crosswind runway	$700,000
3	No Action	$0

Note: All cost estimates use 2015 dollars and are for planning purposes only

Crosswind Runway Alternative 1: North

Alternative 1 would improve a portion of the old Runway 15-33 surface resulting in a permanent crosswind Runway 15-33 to the north of the Runway 21 threshold. The runway would be designed to accommodate RDC B-I (small) design standards. Runway 15-33 would be 2,096 feet long by 60 feet wide with a dirt/gravel surface.

The major advantages to this alternative are:

- Would allow small aircraft to operate during most closures of Runway 3-21
- Provides approximately 96 percent of wind coverage at 10.5 knots
- Area has been previously developed to accommodate the old Runway 15-33

The major disadvantages to this alternative are:

- Requires crossing of Runway 3-21 at the Runway 21 threshold to access Runway 15-33
- Runway 33 end is located closer to higher terrain than comparative options

Crosswind Runway Alternative 2: South

Alternative 2 would improve a portion of the old Runway 15-33 surface resulting in a permanent crosswind Runway 15-33 to the west of the aircraft parking apron. The runway would be designed to accommodate RDC B-I (small) design standards. Runway 15-33 would be 2,603 feet long by 60 feet wide with a dirt/gravel surface.

The major advantages to this alternative are:

- Would allow small aircraft to operate during closures of Runway 3-21
- Would not require crossing of Runway 3-21 to access Runway 15-33
- Provides approximately 96 percent of wind coverage at 10.5 knots
- Area has been previously developed to accommodate the old Runway 15-33
- Terrain off each runway end is more flat than comparative options
- Would provide shorter taxi time to aircraft parking apron than comparative options

The major disadvantages to this alternative are:

- Increased grading requirements due to existing topography
- Would be located adjacent to the existing sewage treatment ponds, which may require mitigation for bird hazards

Crosswind Runway Alternative 3: No Action

Alternative 3 is the no action alternative. This alternative would not construct a crosswind runway.

The major advantages to this alternative are:

- Requires no federal or local investment
- No potential environmental impacts
- Requires no construction or adjustment to existing airport layout configuration

The major disadvantages to this alternative are:

- Would render the airport closed during Runway 3-21 closures
- Would not provide recommended crosswind coverage for A/B-I aircraft
- Potential negative impacts to based aircraft and operators

Cost Estimates for Crosswind Runway Alternatives

A summary of the cost estimates for Alternatives 1 through 3 are included in **Table 5-5**. Alternative 3 was omitted from the cost estimates as it does not require any funding.

Table 5-5 Crosswind Runway Cost Estimates

Alternative	Total Cost	Federal Cost*	State Cost*	Local Cost
1	$650,000	$589,095	$30,453	$30,453
2	$700,000	$634,410	$32,795	$32,795

Note: All cost estimates use 2015 dollars, include the cost of a gravel base, grading, base course or two-inch lift state asphalt mix and gravel exit taxiway and are for planning purposes only

*Federal and State funding to be determined based on economic impact during construction

5.3.4 Aircraft Parking Apron

The existing aircraft parking apron would be unable to accommodate the future and ultimate design aircraft without negatively impacting existing taxilanes and tiedowns. Currently, the aircraft parking apron is congested during peak periods. The aircraft parking apron and passenger terminal building should be modified to accommodate regional airline aircraft.

It is recommended to expand the existing aircraft parking apron by 5,776 square yards to the north. The taxilanes in the northern portion of the aircraft parking apron would be reconfigured to accommodate TDG 3 aircraft. The designated commercial service apron would also be expanded to accommodate larger regional air carrier aircraft. An additional aboveground Jet-A fuel storage tank would also be installed. Three helicopter parking pads would also be constructed. Additionally, the passenger terminal building would be expanded to accommodate recommended square footage based on future enplanements. The existing automobile parking lot would be expanded to accommodate future airport users. The general aviation apron, taxilanes and hangar development would be further expanded to the south. Future aircraft parking will be further evaluated as a part of a terminal area study.

5.4 Landside Recommended Development

5.4.1 Passenger Terminal Building

As discussed in Chapter Four, *Facility Requirements*, the existing passenger terminal building does not meet many of the recommneded facility sizing requirements per FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*. It is recommended to expand the existing structure to the north to meet the passenger needs for accommodating C-II regional airline aircraft in the short-term. Expanding the building in the short-term would have lower comparative costs than constructing a new facility, require less infrastructure development and would adequately meet the demands of the airport during the short to medium-term. To accommodate C-III regional airline aircraft, it is recommended to consider the construction of a new passenger terminal building at an alternate location.

5.4.2 Hangar Facilities

Based on existing trends, the majority of hangar development is expected to come from airport users that obtain a land lease and construct their own box hangar or T-hangars. Therefore, hangar development areas have been laid out for a mix of box hangars of various sizes and T-hangars. The recommended layout includes box hangars being constructed during the short-

term south of the existing aircraft parking apron with vehicle access leading to the rear of each box hangar. T-hangars would also be constructed south of the existing aircraft parking apron to allow for both east and westward facing doors.

5.4.3 Airport Access and Automobile Parking

As improvements to the passenger terminal are conducted, it is recommended to expand the paved passenger terminal automobile parking lot. The paving of the parking lot will provide an enhanced passenger experience and provide a clearly defined boundary for vehicle parking. It is recommended to accommodate 50 total parking spots in the short to medium-term. Once the passenger terminal building is relocated, it is recommended to construct an automobile to accommodate 75 parking spots for passenger, employee, rental car or visitors. It is also recommended to construct a 24-foot wide access road connecting the future passenger terminal building and parking lot to U.S. Highway 191.

5.4.4 Perimeter Wildlife Fence

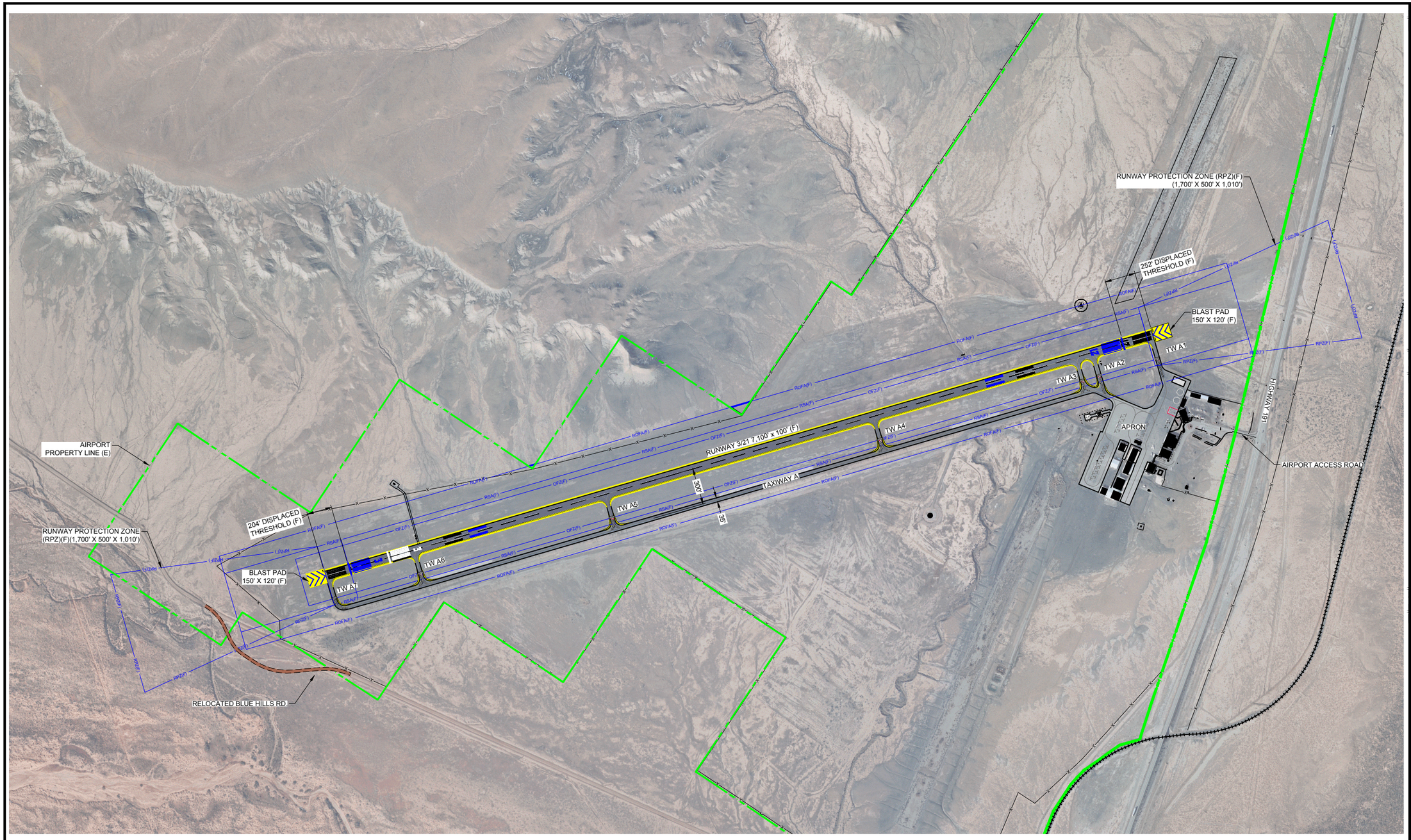
Chapter Four, *Facility Requirements*, recommended the installation of an eight-foot tall wildlife fence once the existing wildlife fence is realigned or has reached the end of its useful life. It is recommended to install the eight-foot tall wildlife fence either along the perimeter of the existing and future airport property boundary.

5.5 Recommendations and Conclusion

A meeting was held on February 26, 2015 with the Technical Advisory Committee, Airport Management, Grand County, Utah Department of Transportation, Federal Aviation Administration and the consultant team at Canyonlands Field to present and discuss the alternatives presented in this Chapter. Based on the results of this meeting, the following alternatives were selected as recommended development:

- C-II/C-III ARC Upgrade: It was recommended to implement a phased approach to attaining a C-III ARC. Phase I would consist of widening Runway 3-21 by 25 feet and use of displaced thresholds to provide a C-II ARC (Alternative 1). Phase II would include shifting Runway 3-21 by 260 feet to the southwest to eliminate the use of displaced thresholds (Alternative 2). Finally, Phase III would include shifting Taxiway A 100 feet to the south to provide a C-III ARC.
- Crosswind Runway: The FAA and UDOT indicated that funding would not be available to construct a crosswind runway at Canyonlands Field. Furthermore, the County indicated the estimated cost would not be feasible to pay for the project with local funding. Therefore, a crosswind runway was eliminated from further consideration and not carried forward onto the Airport Layout Plan.

All other recommended development was approved unanimously by the Technical Advisory Committee to carry forward onto the Airport Layout Plan. The Technical Advisory Committee's recommended development was approved in a 3-2 vote by the Canyonlands Field Airport Board on March 3, 2015. The recommended development was approved unanimously by the Grand County Council on May 5, 2015.



DECLARED DISTANCES

ITEM	FUTURE	
	RW 3	RW 21
TAKEOFF RUN AVAILABLE (TORA) (FT)	6848'	6896'
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	7100'	7100'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	6848'	6896'
LANDING DISTANCE AVAILABLE (LDA) (FT)	6644'	6644'

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- EXISTING PROPERTY LINE
- FUTURE LEASE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

ARMSTRONG CONSULTANTS

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

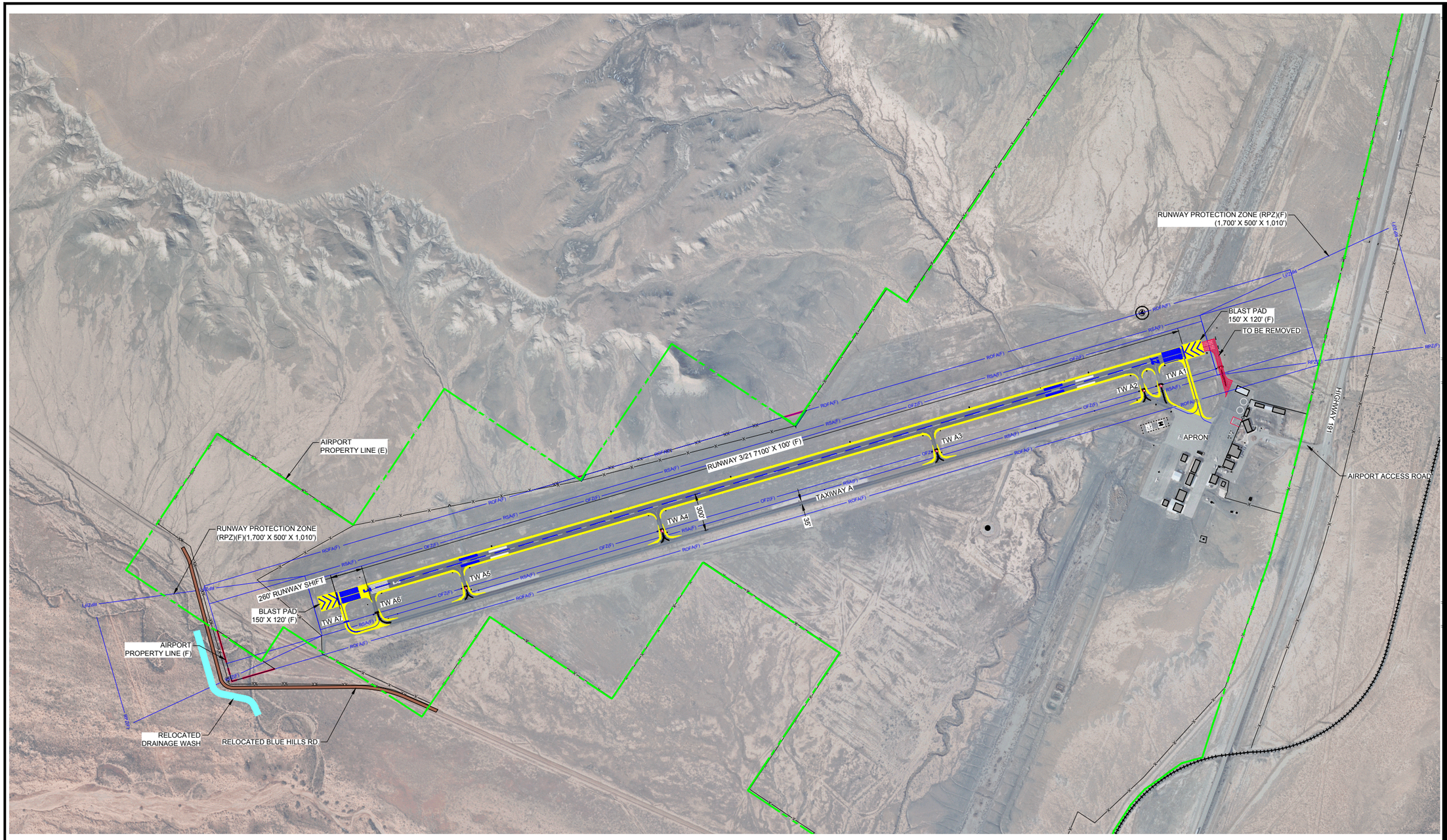
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	146251	01/2015	C-II ARC ALTERNATIVE 1	6251604	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FEDERAL AVIATION ADMINISTRATION. THE CONTENTS DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

C-II ARC
UPGRADE
ALT. 1



LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE PROPERTY LINE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

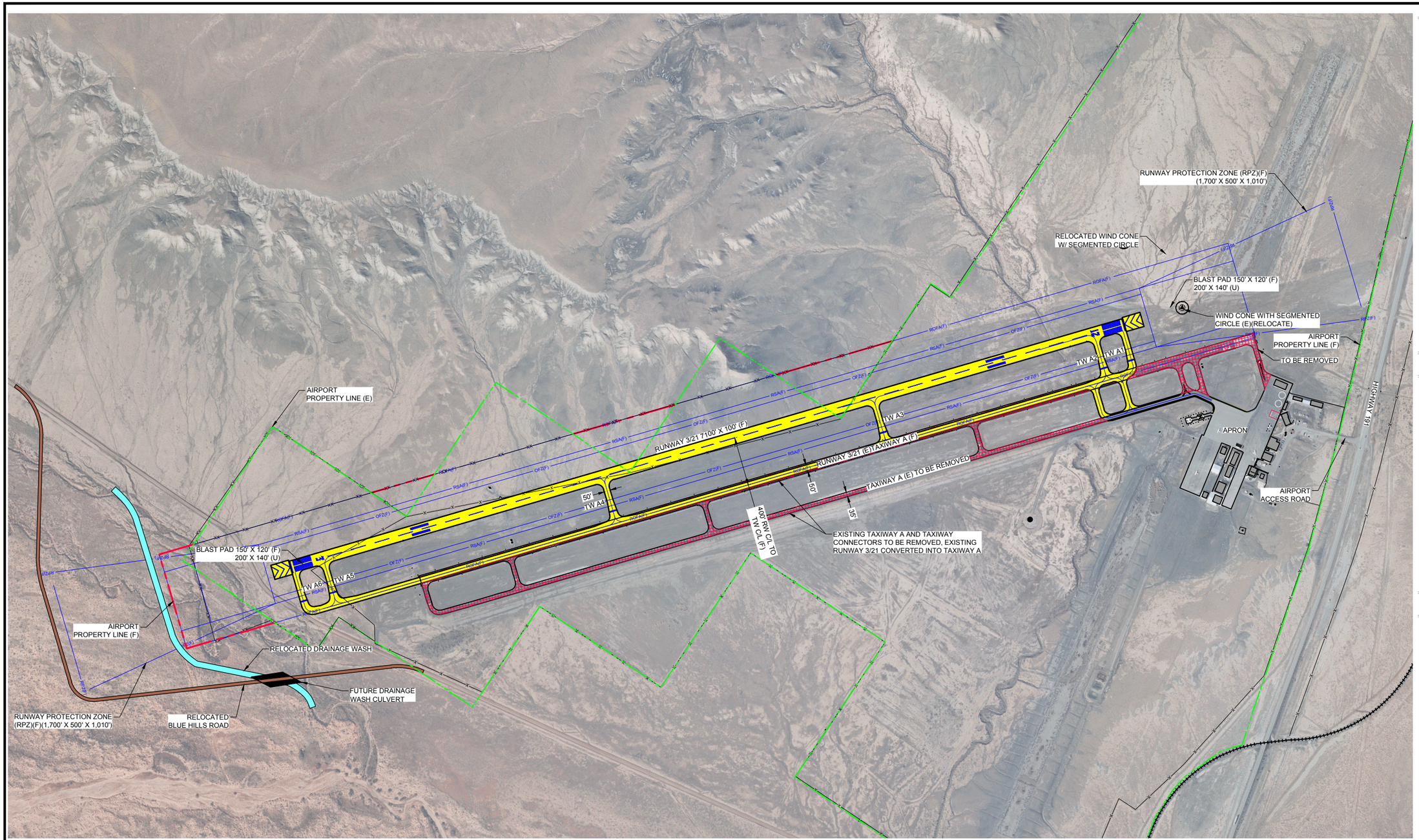
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
1	146251	03/2015	C-II ARC ALTERNATIVE 2	6251616	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FEDERAL AVIATION ADMINISTRATION. IT ALSO DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

C-II ARC
UPGRADE
ALT. 2

Sheet: 1 of: 1



LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE PROPERTY LINE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

N

ARMSTRONG CONSULTANTS

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

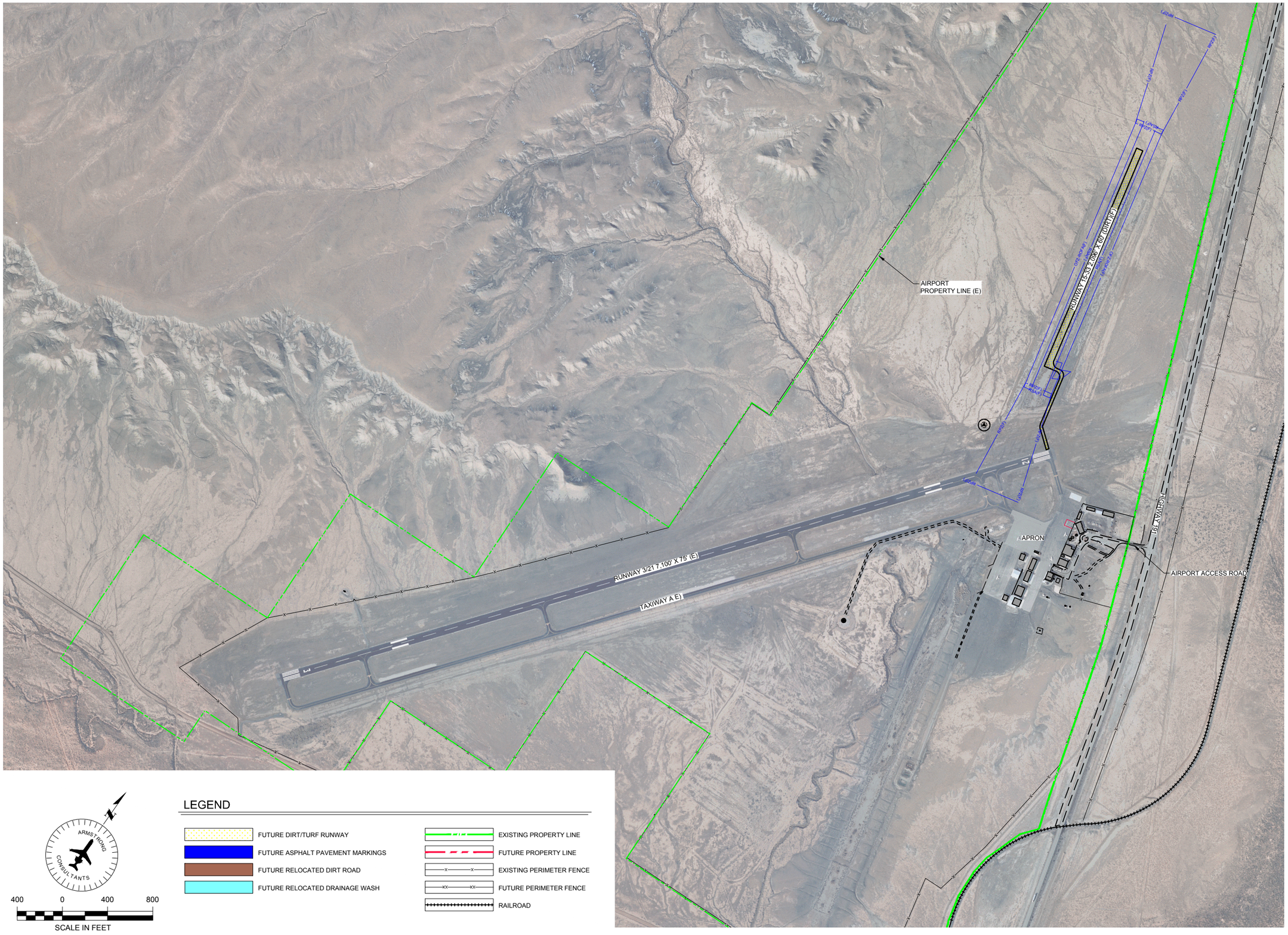
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
1	146251	01/2015	C-II ARC ALTERNATIVE 3	6251606	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

C-II ARC
UPGRADE
ALT. 3

Sheet: 1 of: 1



ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

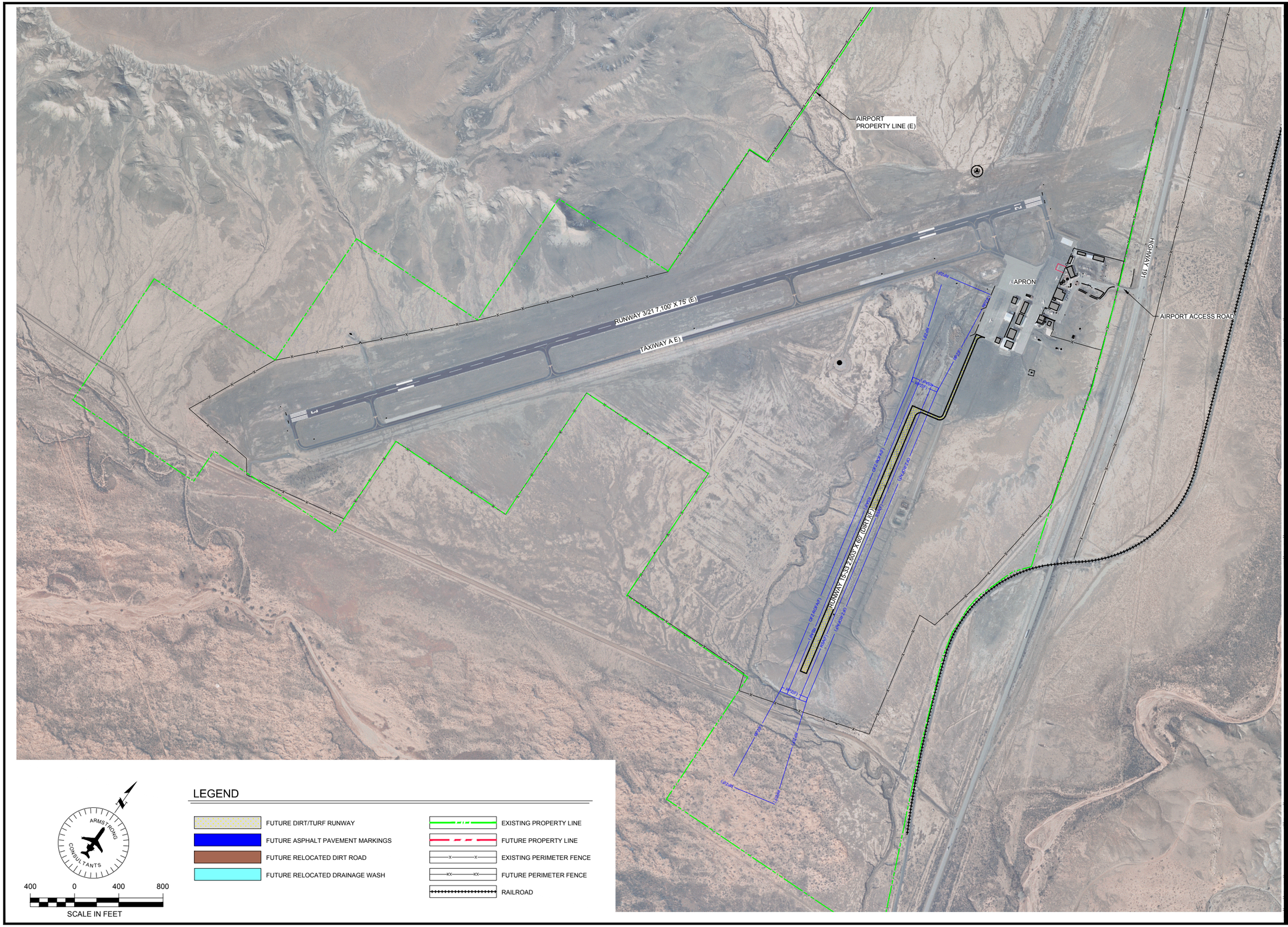
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
1	146251	01/2015	CROSSWIND RUNWAY ALT.1	6251608	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FEDERAL AVIATION ADMINISTRATION. THE DOCUMENT DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DESCRIBED THEREIN. THE DOCUMENT MAY ALSO BE SUBJECT TO REVIEW BY THE FEDERAL AVIATION ADMINISTRATION TO DETERMINE IF THE DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

CROSSWIND RUNWAY ALTERNATIVE 1

Sheet: 1 of: 1



ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

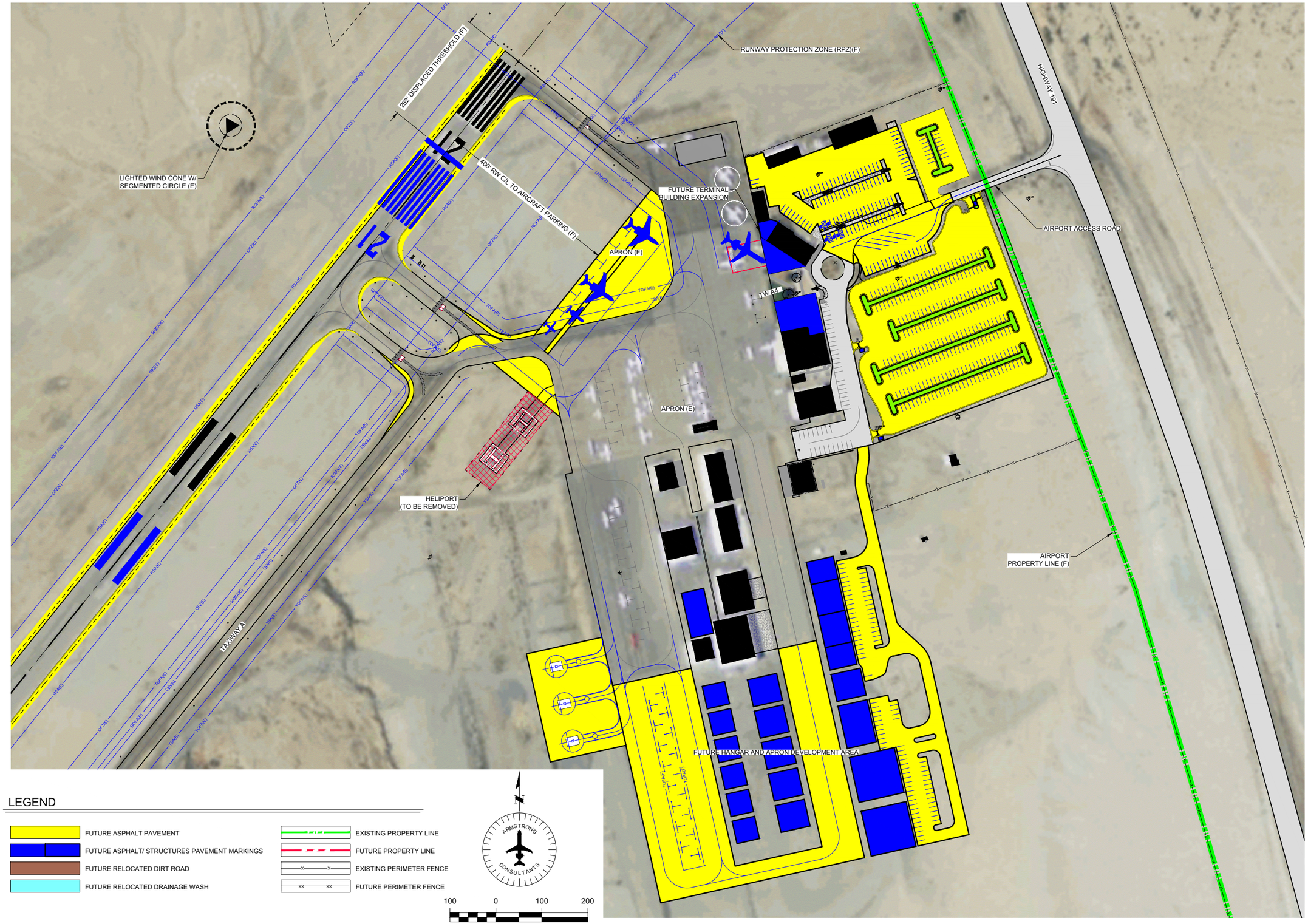
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
1	146251	01/2015	CROSSWIND RUNWAY ALT.2	6251609	GWK	JMR	JZP

THE INFORMATION IN THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

CROSSWIND RUNWAY ALTERNATIVE 2

Sheet: 1 of: 1



ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
1	146251	01/2015	C-II ARC ALTERNATIVE 1	6251610	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE BY THE FAA OF THIS DOCUMENT DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

AIRCRAFT PARKING APRON EXPANSION PHASE I

Sheet: 1 of: 1

CHAPTER SIX

AIRPORT LAYOUT PLAN

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CANYONLANDS FIELD

GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

PREPARED BY:

ARMSTRONG CONSULTANTS, INC.

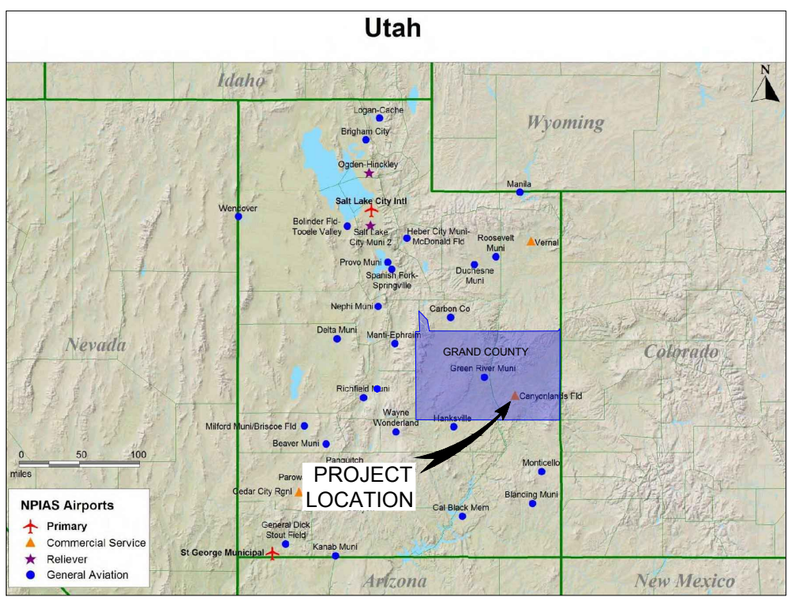
A.C.I. PROJECT NO. 146251

DATE: SEPTEMBER, 2015

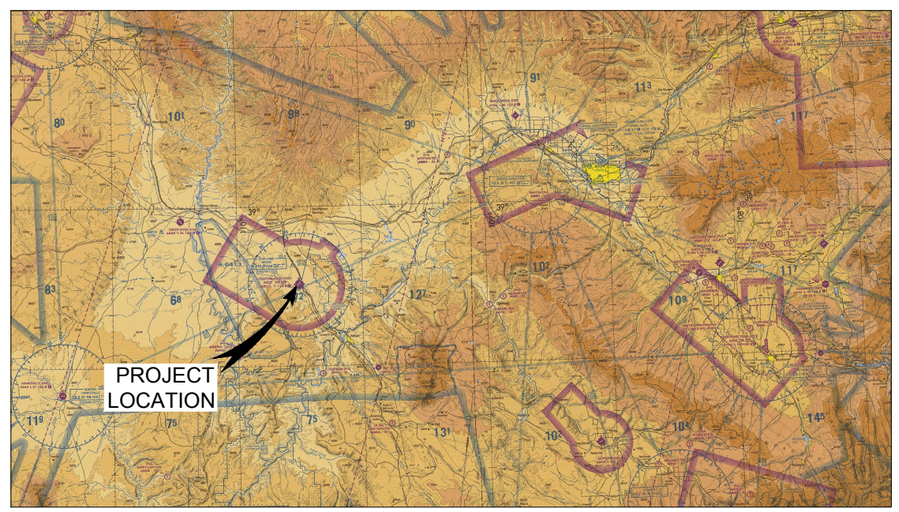
INDEX TO SHEETS

DRAWING	SHEET
COVER SHEET	1
AIRPORT LAYOUT PLAN	2
AIRPORT DATA SHEET	3
TERMINAL AREA DRAWING	4
14 CFR PART "77" AIRSPACE DRAWING	5
14 CFR PART "77" PROFILE DRAWING	6 - 7
RUNWAY 3 INNER APPROACH (E)	8
RUNWAY 21 INNER APPROACH (E)	9
RUNWAY 3 INNER APPROACH (F)	10
RUNWAY 21 INNER APPROACH (F)	11
RUNWAY 3 INNER APPROACH (U)	12
RUNWAY 21 INNER APPROACH(U)	13
RUNWAY 15 INNER APPROACH(F)(U)	14
RUNWAY 33 INNER APPROACH(F)(U)	15
ON AIRPORT LAND USE	16
OFF AIRPORT LAND USE	17
EXHIBIT "A" AIRPORT PROPERTY INVENTORY MAP	18
AERIAL PHOTOGRAPH	19

(E = EXISTING, F = FUTURE)



LOCATION MAP



VICINITY MAP

62XX501

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146251	09/2015	ORIGINAL ISSUE	6251501	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)	NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)
1	TERMINAL / FBO	4583'	25	BOX HANGAR	4580
2	PARKING GARAGE	4567'	26	BOX HANGAR	4580'
3	PARKING GARAGE	4565'	27	BOX HANGAR	4580'
4	PARKING GARAGE	4565'	28	BOX HANGAR	4580'
5	HANGAR	4586'	29	BOX HANGAR	4580'
6	WASH BAY	4580'	30	BOX HANGAR	4580'
7	BOX HANGAR	4589'	31	BOX HANGAR	4580'
8	BEACON	4619'	32	BOX HANGAR	4579'
9	PUMP HOUSE	4583'	33	BOX HANGAR	4582'
10	ARFF STATION	4595'	34	BOX HANGAR	4587'
11	BOX HANGAR	4593'	35	BOX HANGAR	4587'
12	BOX HANGAR	4593'	36	BOX HANGAR	4580'
13	BOX HANGAR	4593'	37	BOX HANGAR	4580'
14	BOX HANGAR	4593'	38	BOX HANGAR	4580'
15	BOX HANGAR	4588'	39	BOX HANGAR	4594'
16	ELECTRICAL SUBSTATION	4568'	40	FUEL FARM	4578'
17	BOX HANGAR	4590'	41	RCO BUILDING	-
18	BOX HANGAR	4592'	42	ELECTRICAL VAULT	-
19	BOX HANGAR	4589'	43	LIGHTED WIND CONE WITH SEGMENTED CIRCLE	4578'
20	BOX HANGAR	4580'	44	VOR / DME	4561'
21	BOX HANGAR	4580'	45	ASOS	4591'
22	BOX HANGAR	4580'	46	SUPPLEMENTAL WIND CONE	4554'
23	BOX HANGAR	4580'			
24	BOX HANGAR	4580'			

○ EXISTING
□ FUTURE

ELEVATIONS ARE ESTIMATED

ROADWAYS AND RAILWAYS

NO.	DESCRIPTION	TOP ELEVATION
1	(E) BLUE HILLS ROAD INTERSECTS (F) APPROACH SURFACE	4557'
2	(E) BLUE HILLS ROAD INTERSECTS (E) APPROACH SURFACE	4556'
3	(E) BLUE HILLS ROAD INTERSECTS (U) APPROACH SURFACE	4556'
4	(E) BLUE HILLS ROAD INTERSECTS WITH EXTENDED RUNWAY C/L	4572'
5	(E)BLUE HILLS ROAD INTERSECTS (U) APPROACH SURFACE	4568'
6	(E) BLUE HILLS ROAD INTERSECTS (E) APPROACH SURFACE	4568'
7	(E) BLUE HILLS ROAD INTERSECTS (F) APPROACH SURFACE	4568'
8	(U) BLUE HILLS ROAD INTERSECTS EXTENDED RUNWAY C/L	4563'
9	(U) BLUE HILLS ROAD INTERSECTS (U) APPROACH SURFACE	4563'
10	(U) BLUE HILLS ROAD INTERSECTS (E) APPROACH SURFACE	4563'
11	(U) BLUE HILLS ROAD INTERSECTS (F) APPROACH SURFACE	4562'
12	(E) BLUE HILLS ROAD INTERSECTS (F) APPROACH SURFACE	4557'
13	(F) BLUE HILLS ROAD INTERSECTS (F) APPROACH SURFACE	4557'
14	(U) BLUE HILLS ROAD INTERSECTS (F) APPROACH SURFACE	4557'
15	HIGHWAY 191 INTERSECTS (F)(U) APPROACH SURFACE	4570'
16	HIGHWAY 191 INTERSECTS (E) APPROACH SURFACE	4570'
17	HIGHWAY 191 INTERSECTS WITH EXTENDED RUNWAY C/L	4573'
18	HIGHWAY 191 INTERSECTS (E) APPROACH SURFACE	4578'
19	HIGHWAY 191 INTERSECTS (F)(U) APPROACH SURFACE	4579'
20	RAILROAD INTERSECTS (F)(U) APPROACH SURFACE	4575'
21	RAILROAD INTERSECTS (E) APPROACH SURFACE	4575'
22	RAILROAD INTERSECTS WITH EXTENDED RUNWAY C/L	4580'
23	RAILROAD INTERSECTS (E) APPROACH SURFACE	4585'
24	RAILROAD INTERSECTS (F)(U) APPROACH SURFACE	4585'

NOTE: ESTIMATED ELEVATIONS ARE FOR TRAVERSEWAY WITH ADJUSTMENT

TAXIWAY TABLE

NO.	NAME	WIDTH
1	A1 (E)	35'
2	A1 (F)	50'
3	A2 (E)(F)	38'(E) 50'(F)
4	A3 (E)	35'
5	A4 (E)	36'
6	A3 (F)	50'
7	A5 (E)	35'
8	A4 (F)	50'
9	A6 (E)	35'
10	A7 (E) A5 (F)	35'(E) 50'(F)
11	A6 (F)	50'

SPONSOR APPROVAL

Grand County Council Chair DATE

FAA APPROVAL

LEGEND

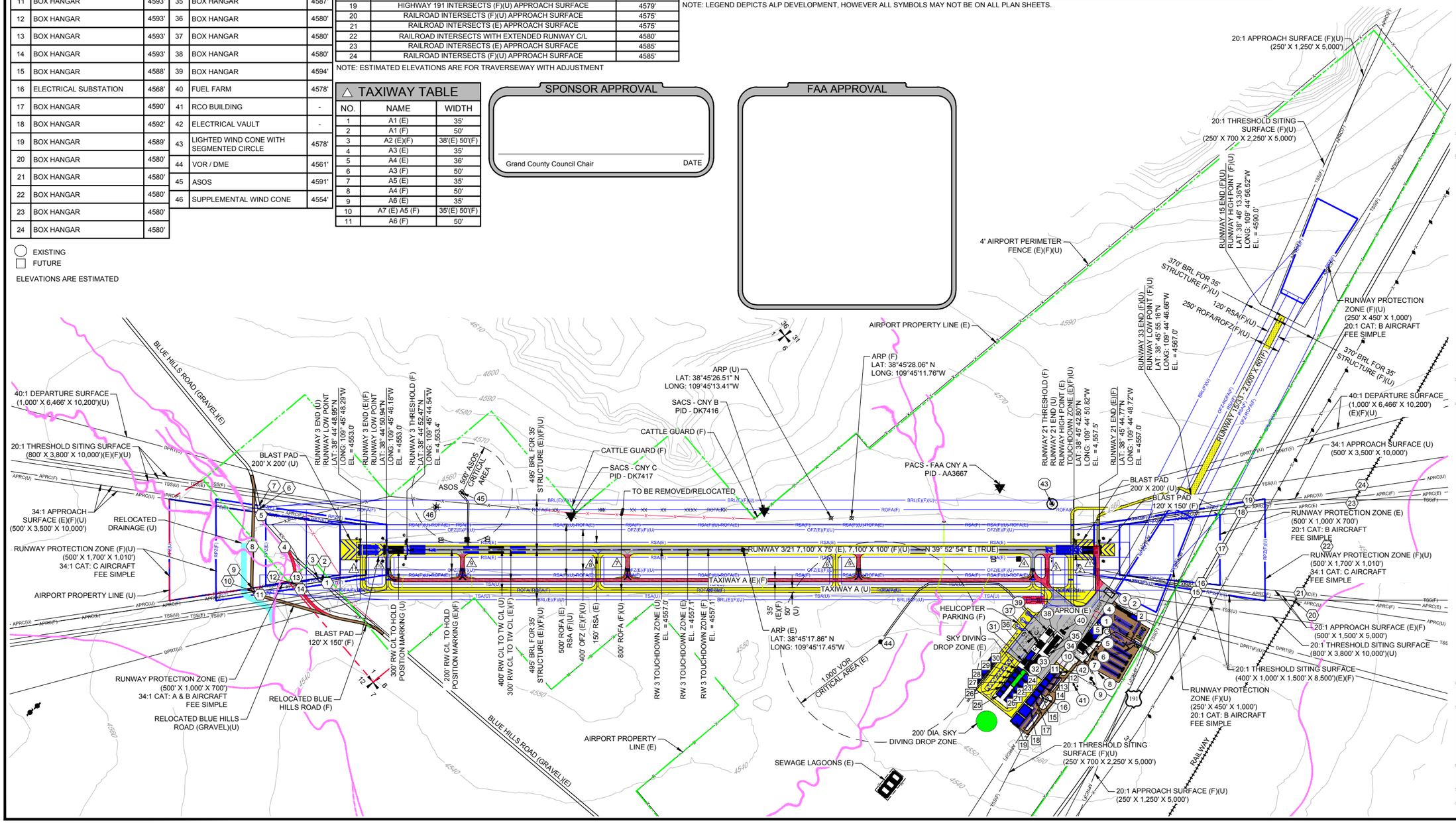
EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT	0000 0000	0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			ASOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	4125	N/A	CONTOURS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			ROADS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)			FENCING
	N/A	PACS/SACS MONUMENT			HELICOPTER PARKING
		DRAINAGE WASH			TO BE REMOVED
		POWER POLE		N/A	RAILROAD TRACKS
		DRAINAGE CULVERT	N/A		CATTLE GUARD

NOTE: LEGEND DEPICTS ALP DEVELOPMENT, HOWEVER ALL SYMBOLS MAY NOT BE ON ALL PLAN SHEETS.

10°35'

MAGNETIC NORTH SOURCE:
NOAA GEOPHYSICAL DATA CENTER
MAGNETIC DECLINATION 10°35' EAST
RATE OF CHANGE 0°6' WEST PER YEAR
OBTAINED: 02/26/15

500 0 500 1000
SCALE IN FEET



ARMSTRONG CONSULTANTS
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251502	GWK	JMR	JZP

THE INFORMATION ON THIS DOCUMENT MAY HAVE BEEN SUPPLIED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WORTHY OF FEDERAL AID.

AIRPORT LAYOUT PLAN

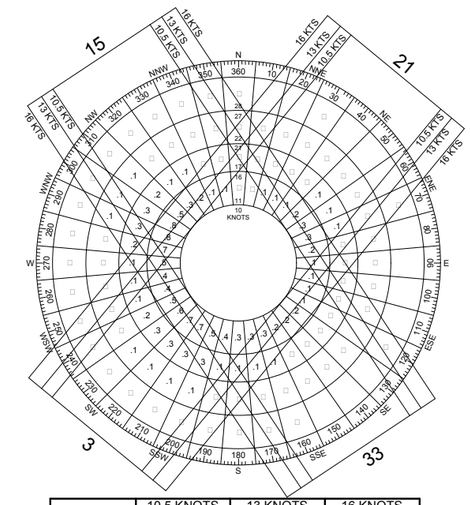
RUNWAY DATA

ITEM		RW 3/21 - EXISTING (E)		RW 3/21 - FUTURE (F)		RW 3/21 - ULTIMATE (U)		RW 15/33 - FUTURE(F)	
RUNWAY IDENTIFICATION		3	21	3	21	3	21	15	33
RUNWAY DESIGN CODE (RDC) / RUNWAY VISUAL RANGE (RVR)		B-II-5000	B-II - VIS	C-II-5000	C-II-VIS	C-III-5000		B-I (SMALL)-VIS	
DEPARTURE REFERENCE CODE (DPRC)		B-II-5000	B-II - VIS	C-II-5000	C-II-VIS	C-III-5000		B-I (SMALL)-VIS	
SURFACE MATERIAL, PAVEMENT STRENGTH □ MATERIAL TYPE	SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT		GRAVEL	
	STRENGTH BY WHEEL LOADING (LBS)	25,000 l□s.SWG		55,000 DWG		85,000 DWG		N/A	
	PCN (FOR BEARING STRENGTH OF 12,500 LBS OR GREATER)	N/A		N/A		N/A		N/A	
	SURFACE TREATMENT	PFC		GROOVED		GROOVED		N/A	
RUNWAY GRADIENT	EFFECTIVE (□)	.06□		.06□		.06□		1.15□	
	MAXIMUM (□)	.07□		.07□		.07□		1.15□	
	LINE OF SIGHT MET (Y OR N)	YES		YES		YES		YES	
PERCENT WIND COVERAGE	A-I / B-I - 10.5 KTS	92.72□		92.72□		92.72□		91.02□	
	A-II / B-II - 13 KTS	95.50□		95.50□		95.50□		94.33□	
	A/B - II, C-I THROUGH C-III, D-I THROUGH D-III 16 KTS	98.07□		98.07□		98.07□		97.43□	
RUNWAY DIMENSIONS (FT)		7,100□X 75□		7,100□X 100□		7,100□X 100□		2,000□X 60□	
RUNWAY SAFETY AREA (RSA)	WIDTH (FT)	150		500		500		120	
	LENGTH BEYOND RUNWAY END (FT)	300	300	1,000	1,000	1,000	1,000	240	240
RUNWAY COORDINATES (NAD 83)	RUNWAY END LATITUDE	N38° 44' 50.94"	N38° 45' 44.77"	N38° 44' 50.94"	N38° 45' 44.77"	N38° 44' 48.95"	N38° 45' 42.80"	N38° 46' 13.36"	N38° 45' 55.16"
	RUNWAY END LONGITUDE	W109° 45' 46.18"	W109° 44' 48.72"	W109° 45' 46.18"	W109° 44' 48.72"	W109° 45' 48.29"	W109° 44' 50.82"	W109° 44' 56.52"	W109° 44' 46.66"
	DISPLACED THRESHOLD LAT.	N/A	N/A	38° 44' 52.47"	38° 45' 42.80"	N/A	N/A	N/A	N/A
	DISPLACED THRESHOLD LONG.	N/A	N/A	109° 45' 44.54"	109° 44' 50.82"	N/A	N/A	N/A	N/A
RUNWAY ELEVATIONS (NAVD 88)	RUNWAY END (FT)	4,553.0	4,557.0	4,553.5	4,557.4	4,552.5	4,557.5	4,590	4,567
	DISPLACED THRESHOLD (FT)	N/A	N/A	4,553.5	4,557.4	N/A	N/A	N/A	N/A
	TOUCHDOWN ZONE (TDZ) (FT)	4,557.0	4,557.5	4,557.0	4,557.5	4,557.0	4,557.5	N/A	N/A
	HIGH POINT (FT)	4,557.5		4,557.5		4,557.5		4,590.0	
	LOW POINT (FT)	4,552.5		4,553.4		4,552.5		4,567.0	
RUNWAY LIGHTING TYPE		MIRL		MIRL		MIRL		NONE	
RUNWAY PROTECTION ZONE (RPZ) (FT)		500 X 700 X 1,000	500 X 700 X 1,000	500 X 1,010 X 1,700	500 X 1,010 X 1,700	500 X 1,010 X 1,700	500 X 1,010 X 1,700	250 X 450 X 1,000	250 X 450 X 1,000
RUNWAY MARKING TYPE		NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION	NONE	NONE
14 CFR PART 77 APPROACH SURFACES	APPROACH TYPE	NON-PRECISION	VISUAL	NON-PRECISION	VISUAL	NON-PRECISION	NON-PRECISION	VISUAL	VISUAL
	VISIBILITY MINIMUMS (FT)	5,000	5,000	5,000	5,000	5,000	5,000	VIS	VIS
	APPROACH SLOPE DIMENSIONS (FT)	500 X 3,500 X 10,000	500 X 1,500 X 5,000	500 X 3,500 X 10,000	500 X 1,500 X 5,000	500 X 3,500 X 10,000	500 X 3,500 X 10,000	250 X 1,250 X 5,000	250 X 1,250 X 5,000
	APPROACH CATEGORY (SLOPE)	34:1	20:1	34:1	20:1	34:1	34:1	20:1	20:1
TYPE OF AERONAUTICAL SURVEY RE□UIRED FOR APPROACH		NOT VERTICALLY GUIDED							
RUNWAY DEPARTURE SURFACE (YES OR N/A)		YES	N/A	YES	YES	YES	YES	NO	NO
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH (FT)	500		800		800		250	
	LENGTH BEYOND RUNWAY END (FT)	300	300	1,000	1,000	1,000	1,000	240	240
OBSTACLE FREE ZONE (OFZ)	WIDTH (FT)	400		400		400		250	
	LENGTH BEYOND RUNWAY END (FT)	200	200	200	200	200	200	200	200
THRESHOLD SITING SURFACE (TSS)	DIMENSIONS (FT)	800 X 3,800 X 10,000	400 X 1,000 X 1,500 X 8,500	800 X 3,800 X 10,000	400 X 1,000 X 1,500 X 8,500	800 X 3,800 X 10,000	800 X 3,800 X 10,000	250 X 700 X 5,000	250 X 700 X 5,000
	SLOPE	20:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1
	PENETRATIONS	NO THRESHOLD SITING SURFACE PENETRATIONS							
VISUAL AND INSTRUMENT NAVAIDS		GPS/PAPI	PAPI	GPS/PAPI	PAPI	GPS/PAPI	GPS/PAPI	NONE	NONE

AIRPORT DATA

ITEM		EXISTING (E)	FUTURE (F)	ULTIMATE (U)
AIRPORT REFERENCE CODE (ARC)		B-II	C-II	C-III
MEAN MAX. TEMP OF HOTTEST MONTH (°F) (JULY)		98.4° F (JULY)	98.4° F (JULY)	98.4° F (JULY)
AIRPORT ELEVATION (MSL, FT) (NAVD 88) □		4,557.0□	4,590□	4,590□
AIRPORT NAVIGATIONAL AIDS		VOR (UDOT OWNED) /ROTATING BEACON	VOR (UDOT OWNED) /ROTATING BEACON	VOR (UDOT OWNED) /ROTATING BEACON
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	38° 45' 17.86"	38° 45' 28.06"	38° 45' 26.51"
	LONGITUDE	109° 45' 17.45"	109° 45' 11.76"	109° 45' 13.41"
MISCELLANEOUS FACILITIES		MIRL, MITL, PAPI, LIGHTED WIND CONE, ASOS	MIRL, MITL, PAPI, LIGHTED WIND CONE, ASOS	MIRL, MITL, PAPI, LIGHTED WIND CONE, ASOS
ARC AND CRITICAL AIRCRAFT	ARC	B-II	C-II	C-III
	AIRCRAFT	EMBRAER - 120	BOMBARDIER CRJ-200	BOMBARDIER CRJ-900
	WINGSPAN (FT)	65.0	61.80	81.70
	UNDERCARRIAGE (FT)	24.0	10.40	13.60
	APPROACH SPEED (KTS)	120	125	142
AIRPORT MAGNETIC VARIATION	VARIATION	10° 35' E CHANGING BY 0° 6□PER YEAR	TBD	TBD
	DATE	2015-02-26	TBD	TBD
	SOURCE	NOAA GEOPHYSICAL DATA CENTER	TBD	TBD
NPIAS SERVICE LEVEL		CS	P - CS	P - CS
STATE E□UIVALENT SERVICE		GA-REGIONAL	GA-REGIONAL	GA-REGIONAL

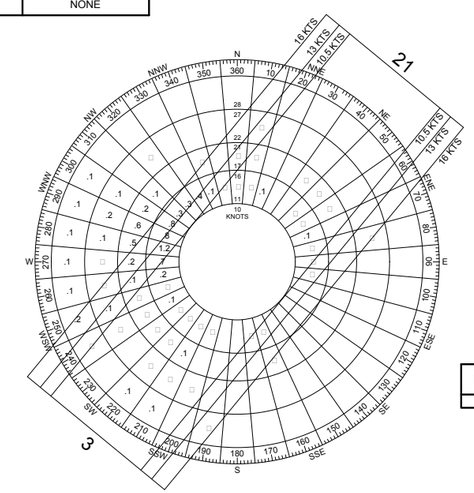
□ RUNWAY END COORDINATES AND ELEVATIONS FROM FAA NASR WEBSITE



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPH	16 KNOTS 20 MPH
3/21	92.72□	95.50□	98.07□
15/33	91.02□	94.33□	97.43
COMBINED	98.04□	99.33□	99.75□

ALL WEATHER WIND ROSE

WIND DATA SOURCE: CANYONLANDS FIELD ASOS
(COLLECTION BETWEEN 2004 TO 2014).
NUMBER OF OBSERVATIONS: 81,701



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPH	16 KNOTS 20 MPH
3/21	92.76□	95.04□	97.44□

IFR WIND ROSE

WIND DATA SOURCE: CANYONLANDS FIELD ASOS
(COLLECTION BETWEEN 2004 TO 2014).
NUMBER OF OBSERVATIONS: 4,410

TAXIWAY AND TAXILANE DIMENSIONS

ITEM	EXISTING (ALL)	FUTURE (ALL)	ULTIMATE (ALL)
TAXIWAY AND TAXILANE DESIGN GROUP (TDG)	2	1A / 2	3
TAXIWAY AND TAXILANE WIDTH (FT)	35	25 / 35	50
TAXIWAY AND TAXILANE SAFETY AREA (FT)	79	49 / 79	118
TAXIWAY AND TAXILANE OBJECT FREE AREA (FT)	TW: 131 TL: 115	TW: 89 TL: 79 / TW: 131 TL: 115	TW: 186 TL: 162
TAXIWAY AND TAXILANE SEPARATION (FT)	TW: 105 TL: 97	TW: 79 TL: 64 / TW: 105 TL: 97	TW: 152 TL: 93
TAXIWAY AND TAXILANE LIGHTING	MITL	MITL	MITL

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (DAD 83). VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88). ELEVATIONS □ RUNWAY END COORDINATES FROM FAA NASR WEBSITE.

DECLARED DISTANCES

ITEM	EXISTING		FUTURE		ULTIMATE		FUTURE		FAA APPROVAL DATE
	RW 3	RW 21	RW 3	RW 21	RW 3	RW 21	RW 15	RW 33	
TAKEOFF RUN AVAILABLE (TORA) (FT)	7,100	7,100	6,848	6,896	7,100	7,100	2,000	2,000	
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	7,100	7,100	7,100	7,100	7,100	7,100	2,000	2,000	
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	7,100	7,100	6,848	6,896	7,100	7,100	2,000	2,000	
LANDING DISTANCE AVAILABLE (LDA) (FT)	7,100	7,100	6,644	6,644	7,100	7,100	2,000	2,000	

MODIFICATION TO STANDARDS APPROVAL

DESCRIPTION	STANDARD TO BE MODIFIED	EXISTING	PROPOSED	PROPOSED ACTION	AIRSPACE CASE NO.	APPROVAL DATE
NONE RE□UIRED						

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

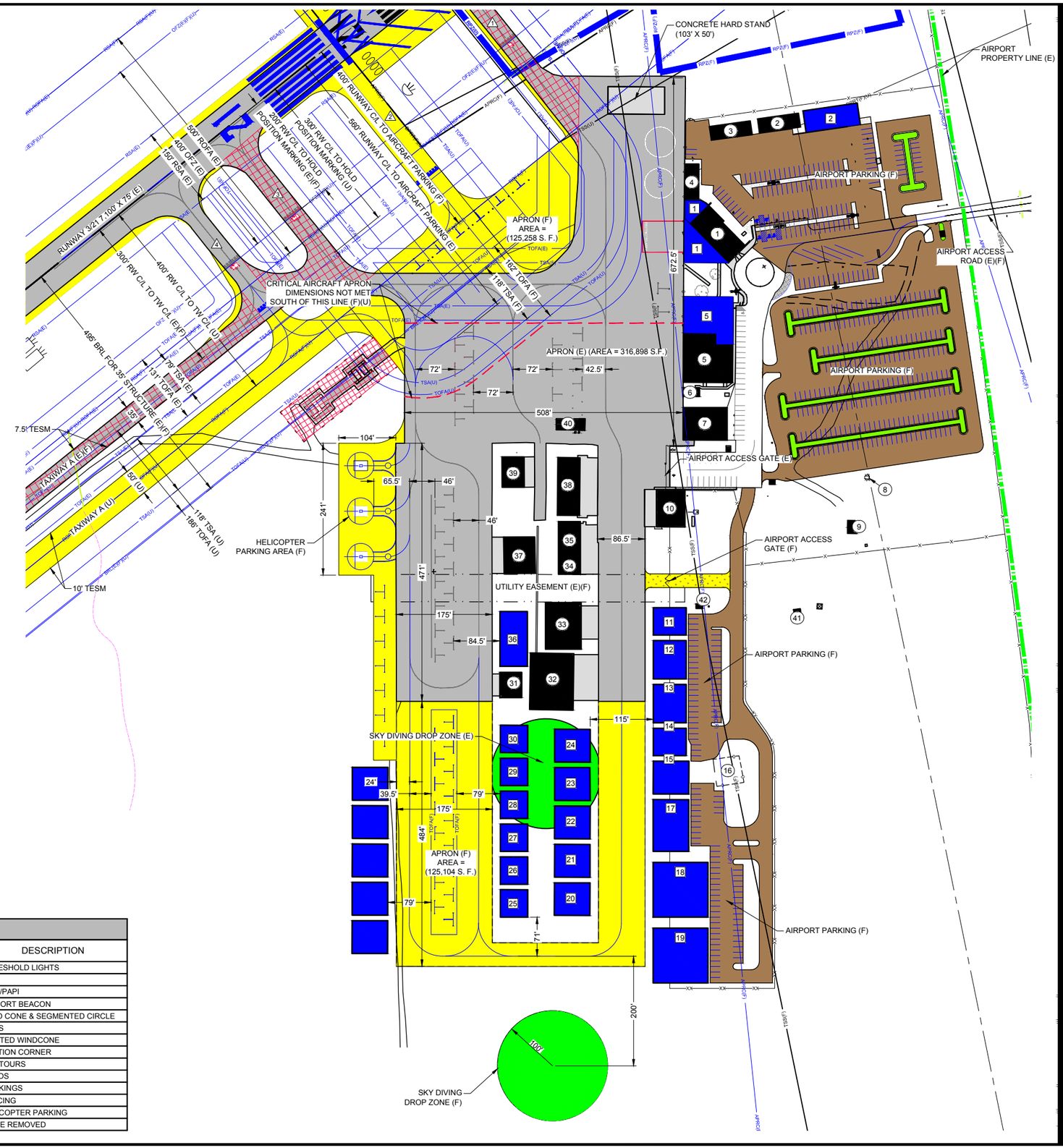
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146251	09/2015	ORIGINAL ISSUE	6251502	GWK	JMR	JZP

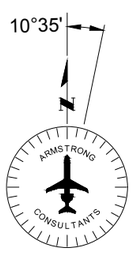
THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE ELIGIBLE FOR FEDERAL FUNDING.

AIRPORT DATA SHEET

NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)	NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)
1	TERMINAL / FBO	4583'	25	BOX HANGAR	4580
2	PARKING GARAGE	4567'	26	BOX HANGAR	4580'
3	PARKING GARAGE	4565'	27	BOX HANGAR	4580'
4	PARKING GARAGE	4565'	28	BOX HANGAR	4580'
5	HANGAR	4586'	29	BOX HANGAR	4580'
6	WASH BAY	4580'	30	BOX HANGAR	4580'
7	BOX HANGAR	4589'	31	BOX HANGAR	4580'
8	BEACON	4619'	32	BOX HANGAR	4579'
9	PUMP HOUSE	4583'	33	BOX HANGAR	4582'
10	ARFF STATION	4595'	34	BOX HANGAR	4587'
11	BOX HANGAR	4593'	35	BOX HANGAR	4587'
12	BOX HANGAR	4593'	36	BOX HANGAR	4580'
13	BOX HANGAR	4593'	37	BOX HANGAR	4580'
14	BOX HANGAR	4593'	38	BOX HANGAR	4580'
15	BOX HANGAR	4588'	39	BOX HANGAR	4594'
16	ELECTRICAL SUBSTATION	4568'	40	FUEL FARM	4578'
17	BOX HANGAR	4590'	41	RCO BUILDING	-
18	BOX HANGAR	4592'	42	ELECTRICAL VAULT	-
19	BOX HANGAR	4589'	43	LIGHTED WIND CONE WITH SEGMENTED CIRCLE	4578'
20	BOX HANGAR	4580'	44	VOR / DME	4561'
21	BOX HANGAR	4580'	45	ASOS	4591'
22	BOX HANGAR	4580'	46	SUPPLEMENTAL WIND CONE	4554'
23	BOX HANGAR	4580'			
24	BOX HANGAR	4580'			

◯ EXISTING
□ FUTURE
ELEVATIONS ARE ESTIMATED





MAGNETIC NORTH SOURCE:
NOAA GEOPHYSICAL DATA CENTER
MAGNETIC DECLINATION 10°35' EAST
RATE OF CHANGE 0°6' WEST PER YEAR
OBTAINED: 02/26/15

100 0 100 200
SCALE IN FEET

TAXIWAY TABLE

NO.	NAME	WIDTH
1	A1 (E)	35'
2	A1 (F)	50'
3	A2 (E)(F)	38'(E) 50'(F)
4	A3 (E)	35'
5	A4 (E)	36'
6	A3 (F)	50'
7	A5 (E)	35'
8	A4 (F)	50'
9	A6 (E)	35'
10	A7 (E) A5 (F)	35'(E) 50'(F)
11	A6 (F)	50'

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			ASOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	4125	N/A	CONTOURS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			ROADS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)	X	XX	FENCING
	N/A	PACS/SACS MONUMENT			HELICOPTER PARKING
					TO BE REMOVED

NOTE: LEGEND DEPICTS ALP DEVELOPMENT, HOWEVER ALL SYMBOLS MAY NOT BE ON ALL PLAN SHEETS.

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

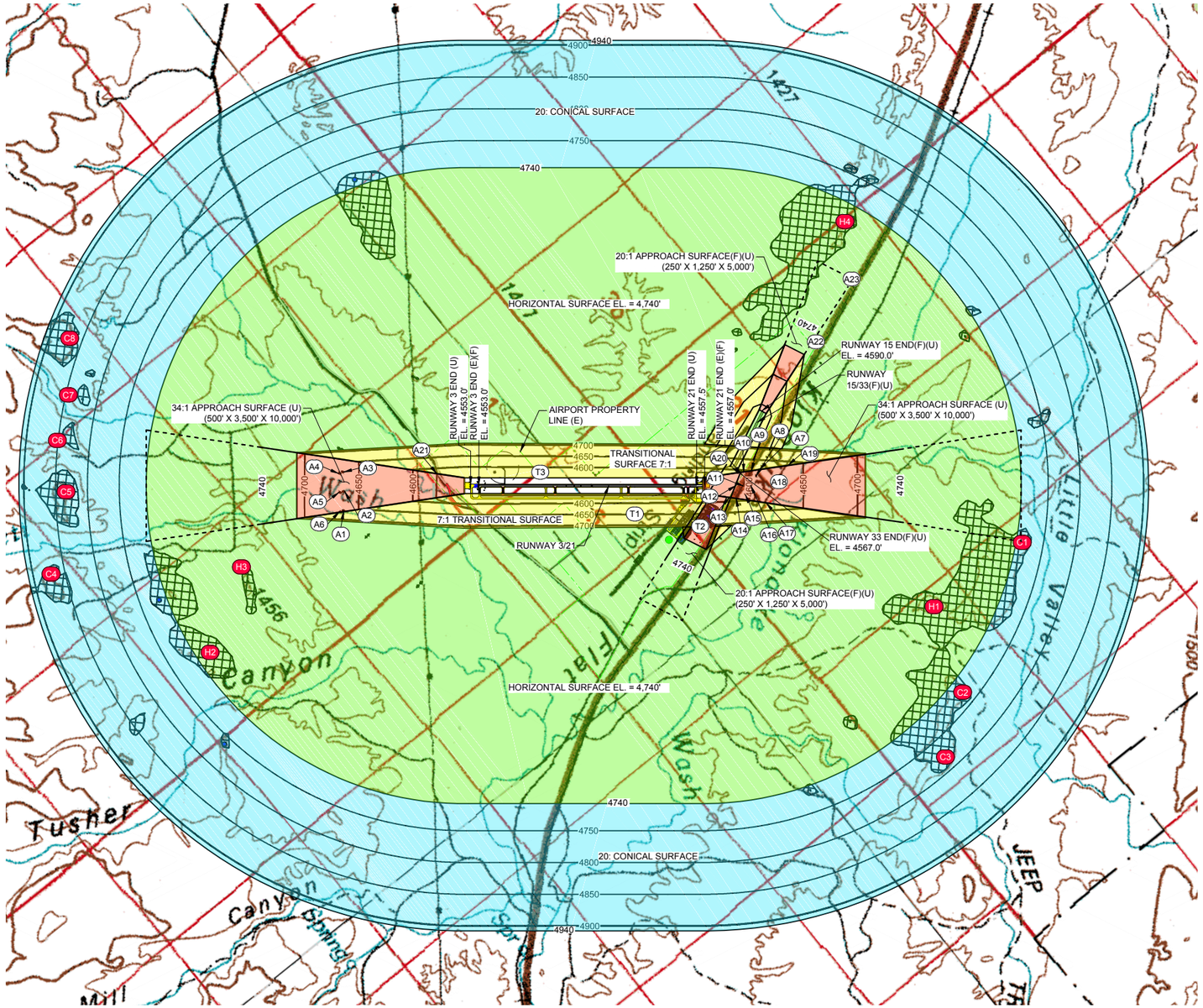
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251503	GWK	JMR	JZP

THE INFORMATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT OFFICIAL FAA POLICY OR PRACTICE AND THE CONTENTS DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

TERMINAL AREA DRAWING



PLAN (U)

SCALE: PER BARSCALE

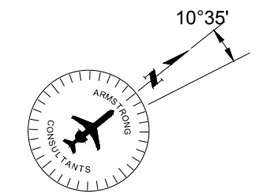
NOTES

A) REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWINGS FOR DETAILS ON ANY CLOSE-IN APPROACH OBSTRUCTIONS.

B) AN FAA FORM 7460-1, "NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION" MUST BE SUBMITTED FOR ANY CONSTRUCTION OR ALTERATION (INCLUDING HANGARS AND OTHER ON-AIRPORT AND OFF-AIRPORT STRUCTURES, TOWERS, ETC.) WITHIN 20,000 HORIZONTAL FEET OF THE AIRPORT GREATER IN HEIGHT THAN AN IMAGINARY SURFACE EXTENDING OUTWARD AND UPWARD FROM THE RUNWAY AT A SLOPE OF 100 TO 1 OR GREATER IN HEIGHT THAN 200 FEET ABOVE GROUND LEVEL.

C) APPROACH SURFACES BASED ON ULTIMATE CONDITION.

D) OBSTRUCTION INFORMATION WAS DETERMINED USING PREVIOUS OBSTRUCTION SURVEY INFORMATION, AN INQUIRY OF THE FAA OE/AAA DATABASE, AND ESTIMATED ELEVATIONS FROM 30M DEM.



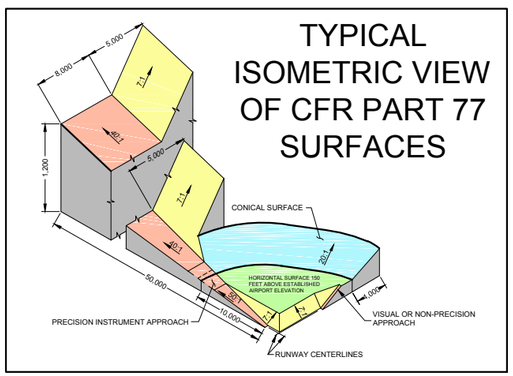
MAGNETIC NORTH SOURCE:
NOAA GEOPHYSICAL DATA CENTER
MAGNETIC DECLINATION 10°35' EAST
RATE OF CHANGE 0°6' WEST PER YEAR
OBTAINED: 02/26/15

2000 0 2000 4000

SCALE IN FEET

LEGEND

HORIZONTAL SURFACE	TRANSITIONAL SURFACE
CONICAL SURFACE	APPROACH SURFACE
PRIMARY SURFACE	TERRAIN PENETRATION



ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146251	09/2015	ORIGINAL ISSUE	6251504	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

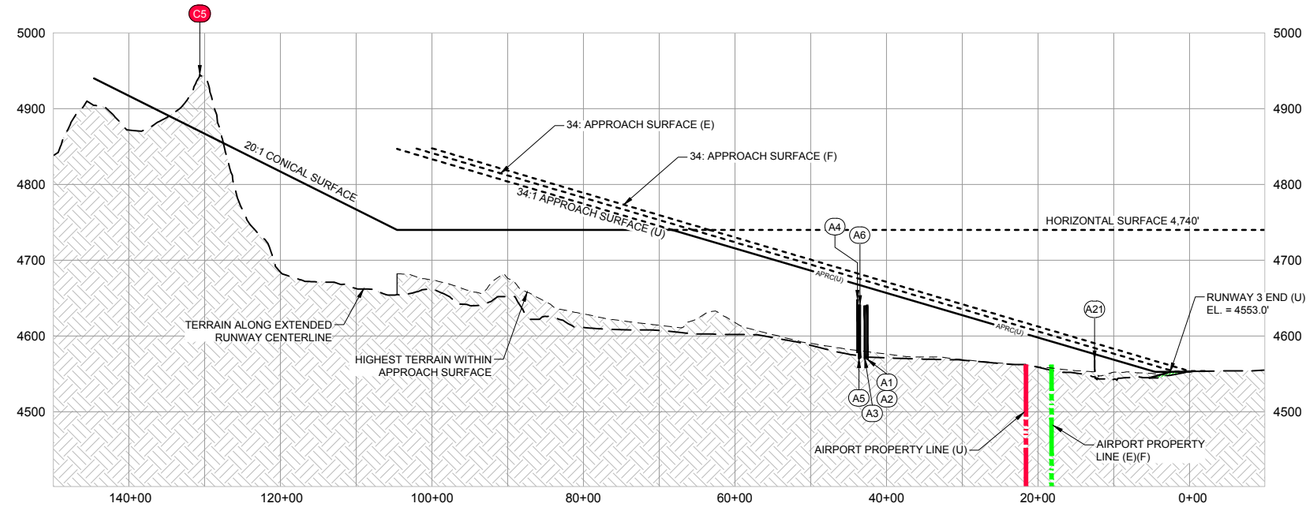
FAR
PART 77
AIRSPACE
DRAWING

OBSTRUCTION CHART

PART 77 SURFACE	ITEM No.	DESCRIPTION	GROUND ELEVATION (MSL)(FEET)	ESTIMATED TOP ELEVATION (MSL)(FEET)	PENETRATION (FEET)	REMARKS
PRIMARY	-	NONE	-	-	-	-
APPROACH	A1	*POWER POLE	4569	4639	-	-
	A2	*POWER POLE	4571	4641	-	-
	A3	*POWER POLE	4577	4642	-	-
	A4	*POWER POLE	4578	4648	-	-
	A5	*POWER POLE	4571	4641	-	-
	A6	*POWER POLE	4571	4641	-	-
	A7	*FENCE	4563	4567	-	-
	A8	***POWER POLE	4554	4590	-	-
	A9	*ROAD	4563	4578	-	-
	A10	*FENCE	4561	4565	-	-
	A11	*ROAD	4555	4570	-	-
	A12	*FENCE	4555	4559	-	-
	A13	*FENCE	4550	4554	-	-
	A14	*ROAD	4553	4568	-	-
	A15	***POWER POLE	4548	4585	-	-
	A16	***POWER POLE	4551	4586	-	-
	A17	*RAILROAD	4552	4569	-	-
	A18	*RAILROAD	4558	4575	-	-
	A19	*RAILROAD	4562	4579	-	-
	A20	***SIGN	4567	4586	-	-
	A21	*ROAD	4553	4568	-	-
	A22	*FENCE	4648	4652	-	-
	A23	*FENCE	4644	4648	-	-
7:1 TRANSITIONAL	T1	**VOR	4549	4566	-	-
	T2	**BEACON	4575	4627	-	-
	T3	**FENCE POLE	4561	4566	-	-
HORIZONTAL	H1	*TERRAIN	4801	4801	+61	SEE NOTE 1
	H2	*TERRAIN	4762	4762	+22	SEE NOTE 1
	H3	*TERRAIN	4741	4741	+1	SEE NOTE 1
	H4	*TERRAIN	4762	4762	+22	SEE NOTE 1
20:1 CONICAL	C1	*TERRAIN	4842	4842	+91	SEE NOTE 1
	C2	*TERRAIN	4812	4812	+49	SEE NOTE 1
	C3	*TERRAIN	4812	4812	+2	SEE NOTE 1
	C4	*TERRAIN	4942	4942	+39	SEE NOTE 1
	C5	*TERRAIN	4962	4962	+94	SEE NOTE 1
	C6	*TERRAIN	4880	4880	+15	SEE NOTE 1
	C7	*TERRAIN	4892	4892	+37	SEE NOTE 1
	C8	*TERRAIN	5072	5072	+154	SEE NOTE 1

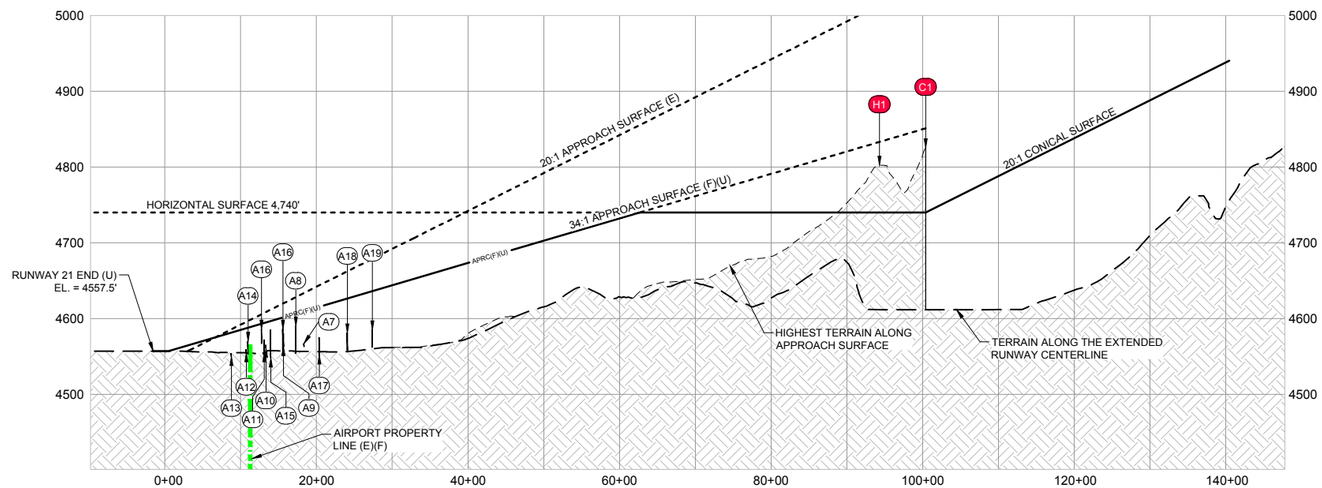
NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.
2. SEE INNER APPROACH DRAWINGS FOR OBSTRUCTIONS IN RPZ.
4. * ESTIMATED TOP ELEVATIONS FROM 30M DEM.
5. ** ODS (OBSTRUCTION DATA SHEET) 5585 CANYONLANDS FIELD OBSTRUCTION SURVEY PERFORMED IN OCTOBER 1986.
6. *** TOP ELEVATION FROM SURVEY PERFORMED BY RED DESERT LANDING SURVEYING, DATED SEPTEMBER 2014.
7. AIRPORT ELEVATION: 4590'



RUNWAY 3 END PROFILE (U)

SCALE: PER GRID



RUNWAY 21 END PROFILE (U)

SCALE: PER GRID

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

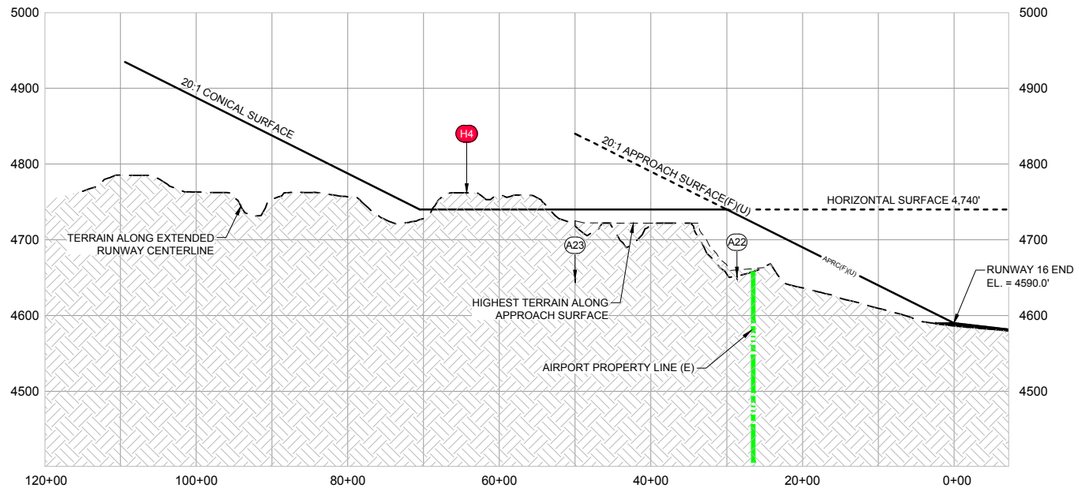
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251504	GWK	JMR	JZP

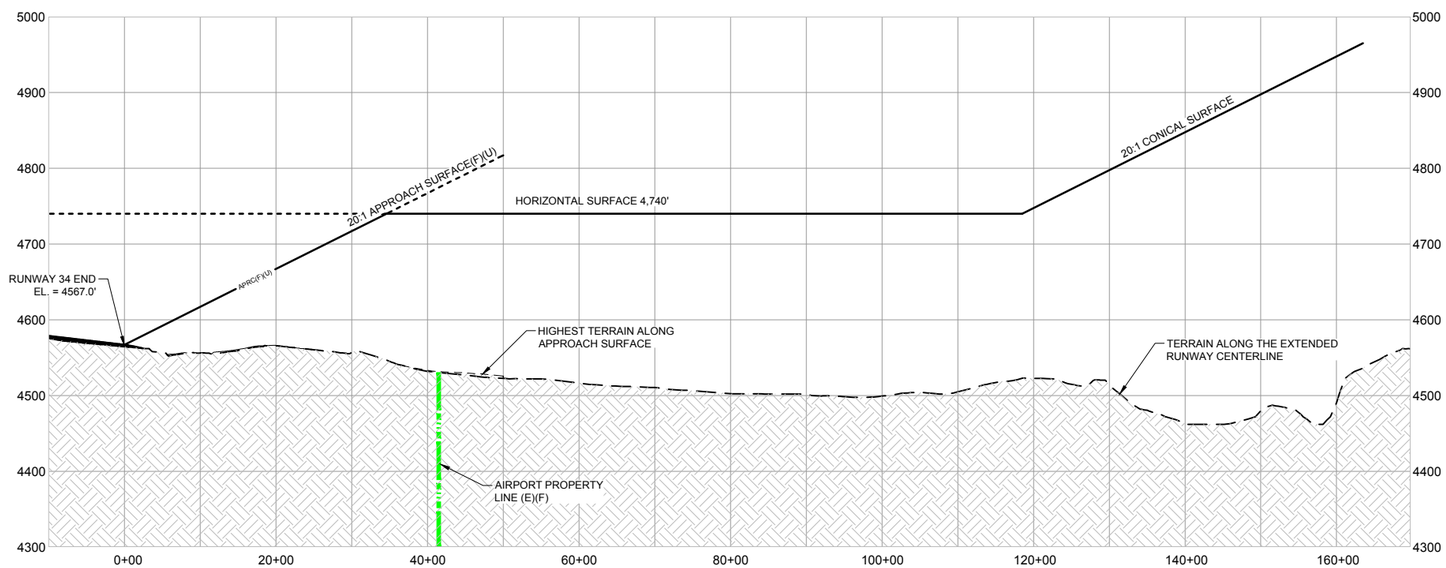
THE INFORMATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE JUSTIFIABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

FAR
PART 77
PROFILE
DRAWING



RUNWAY 15 END PROFILE (F)(U)

SCALE: PER GRID



RUNWAY 33 END PROFILE (F)(U)

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

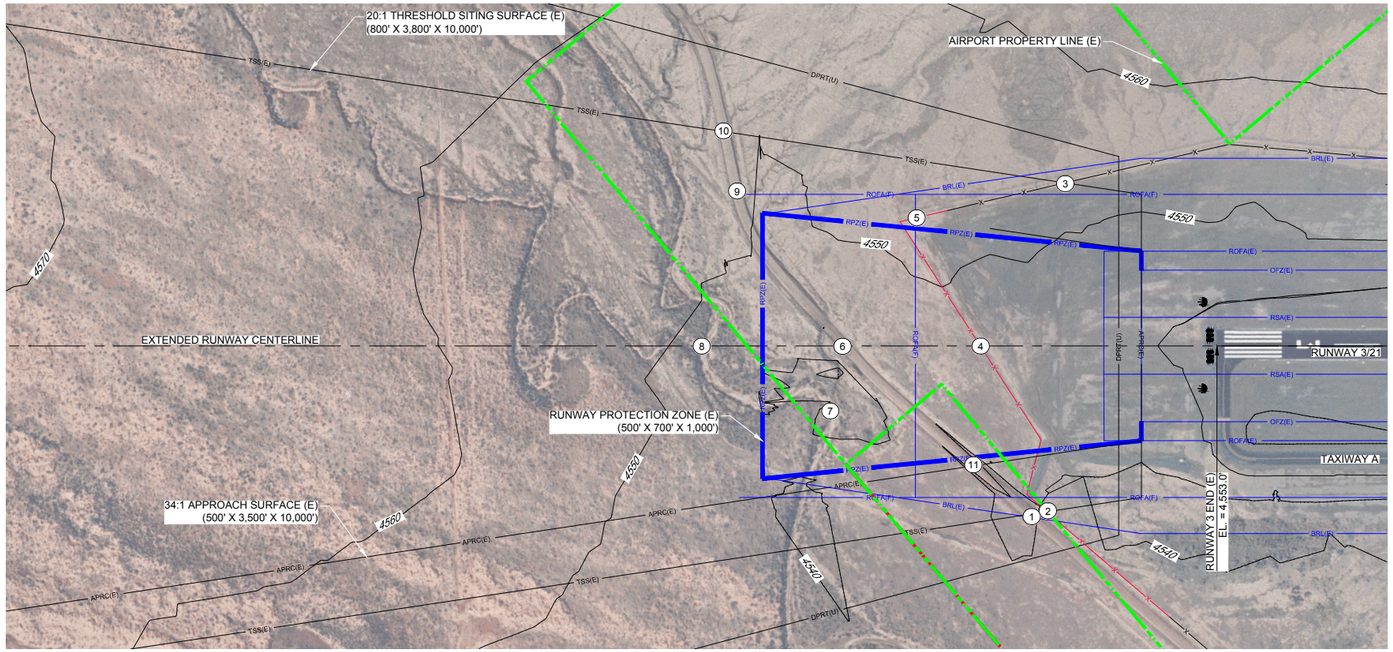
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

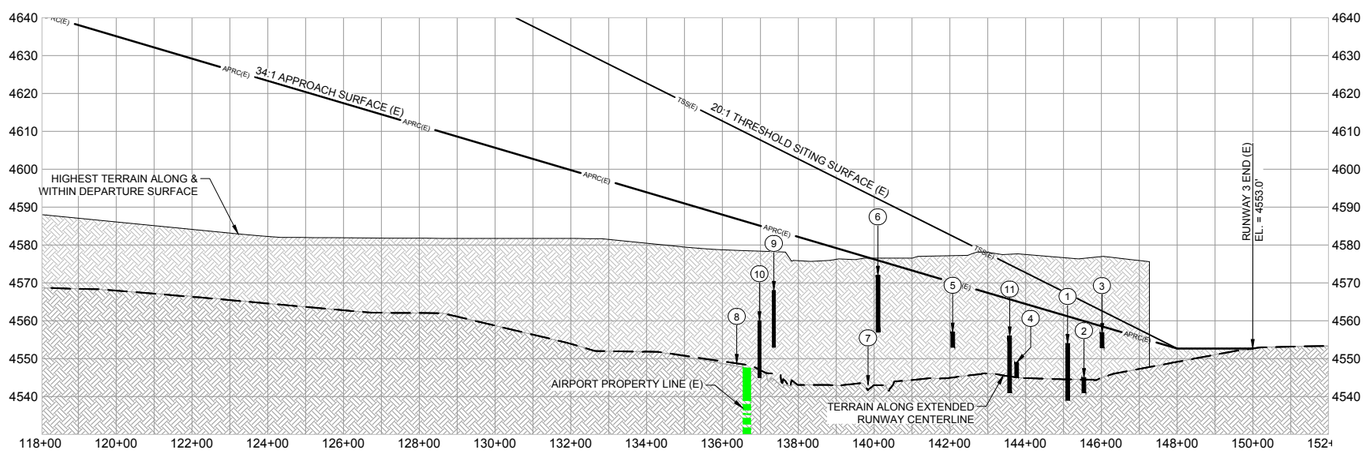
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251504	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS, OPINIONS, FINDINGS, AND CONCLUSIONS OF THIS DOCUMENT ARE THOSE OF ARMSTRONG CONSULTANTS, INC. AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE FEDERAL AVIATION ADMINISTRATION. IN ADDITION, ARMSTRONG CONSULTANTS, INC. DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ELIGIBLE FOR FEDERAL FUNDS. THIS DOCUMENT MAY NOT HAVE BEEN ENVIRONMENTALLY ASSESSED OR VIOLATED HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

FAR
PART 77
PROFILE
DRAWING



PLAN - RUNWAY 3 (E)



PROFILE - RUNWAY 3 (E)

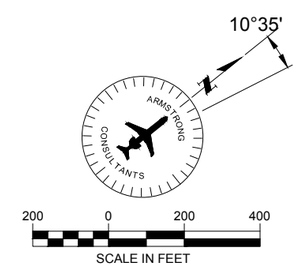
OBJECTS WITHIN RUNWAY 3, APRC & TSS (E)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	REMARKS
1	*ROAD	15'	4554'	NONE	-	-
2	*FENCE	4'	4544'	NONE	-	-
3	*FENCE	4'	4556'	NONE	-	-
4	*FENCE	4'	4549'	NONE	NONE	-
5	*FENCE	4'	4557'	NONE	NONE	-
6	*ROAD	15'	4572'	NONE	NONE	-
7	*DRAINAGE @ CRITICAL POINT	-	-	NONE	NONE	-
8	*DRAINAGE @ C/L	-	-	NONE	NONE	-
9	*ROAD	15'	4568'	NONE	NONE	-
10	*ROAD	15'	4570'	NONE	-	-
11	*ROAD	15'	4556'	NONE	NONE	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION;
N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE;
TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)		0000 0000	THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			REIL
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	4125	N/A	CONTOURS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ROAD
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			MARKINGS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	X	XX	FENCE
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			CUT / FILL
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			TO BE REMOVED

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

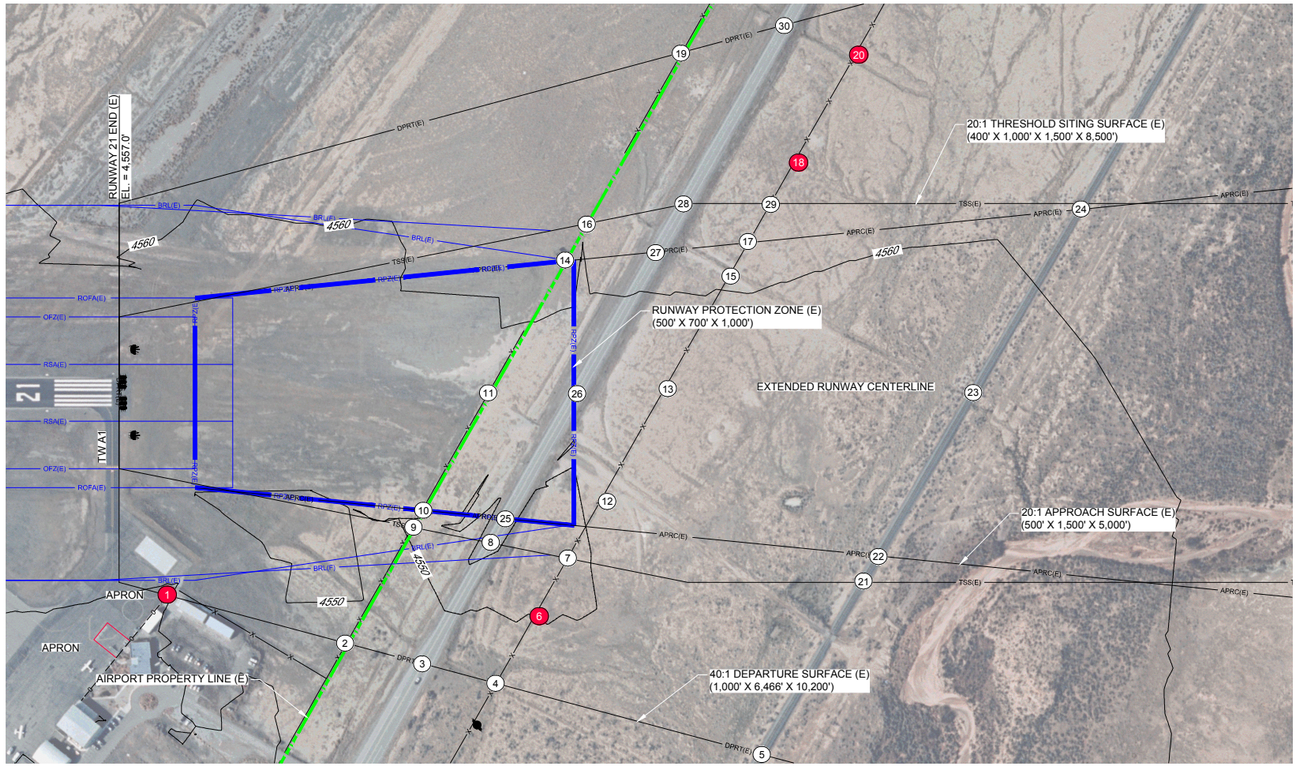
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

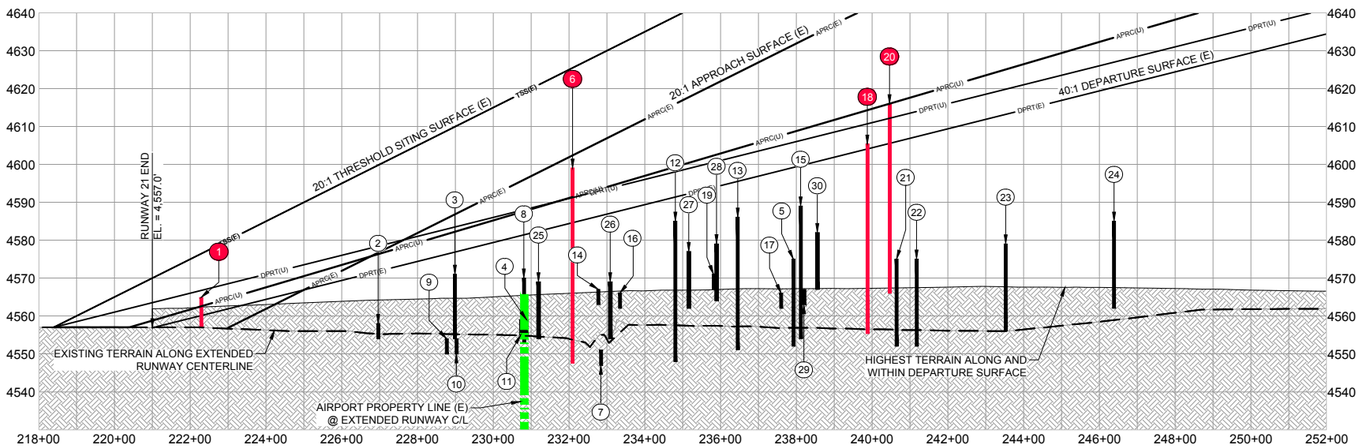
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THIS INFORMATION OR THIS DOCUMENT MAY NOT BE REPRODUCED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS, IN WHOLE OR IN PART, DO NOT CONSTITUTE A STANDARD, SPECIFICATION, OR REGULATION. THIS DOCUMENT DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DESCRIBED THEREIN. THE UNITED STATES DISCLAIMS ALL RESPONSIBILITY FOR ANY ACTIVITY OR ACTION TAKEN ON THE PROJECT DESCRIBED HERE. JUST PLACATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY 3
INNER
APPROACH
(E)



PLAN - RUNWAY 21 (E)



PROFILE - RUNWAY 21 (E)

PER GRID

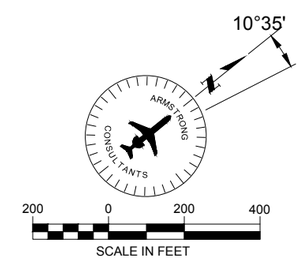
OBJECTS WITHIN RUNWAY 21, APRC, TSS AND DEPARTURE SURFACES (E)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
1	*FENCE	8'	4568'	-	-	+2'	SEE NOTE 1
2	*FENCE	4'	4558'	-	NONE	NONE	-
3	*ROAD	17'	4571'	-	NONE	-	-
4	*FENCE	4'	4555'	-	-	NONE	-
5	*RAILWAY	23'	4575'	-	-	NONE	-
6	**POWER POLE	51.5'	4599'	-	-	+15'	SEE NOTE 2
7	*FENCE	4'	4551'	NONE	-	NONE	-
8	*ROAD	17'	4570'	NONE	-	NONE	-
9	*FENCE	4'	4554'	NONE	-	NONE	-
10	*FENCE	4'	4554'	NONE	NONE	NONE	-
11	*FENCE	4'	4554'	NONE	NONE	NONE	-
12	**POWER POLE	37'	4591'	NONE	NONE	NONE	-
13	**POWER POLE	35'	4586'	NONE	NONE	NONE	-
14	*FENCE	4'	4567'	NONE	NONE	NONE	-
15	**POWER POLE	36'	4590'	NONE	NONE	NONE	-
16	*FENCE	4'	4566'	NONE	-	NONE	-
17	*FENCE	4'	4566'	NONE	NONE	NONE	-
18	**POWER POLE	50'	4606'	NONE	-	+4'	SEE NOTE 2
19	*FENCE	4'	4571'	-	-	NONE	-
20	**POWER POLE	50'	4616'	-	-	+10.5'	SEE NOTE 2
21	*RAILWAY	23'	4575'	NONE	-	NONE	-
22	*RAILWAY	23'	4575'	NONE	NONE	NONE	-
23	*RAILWAY	23'	4579'	NONE	NONE	NONE	-
24	*RAILWAY	23'	4585'	NONE	NONE	NONE	-
25	*ROAD	15'	4569'	NONE	NONE	NONE	-
26	*ROAD	15'	4569'	NONE	NONE	NONE	-
27	*ROAD	15'	4576'	NONE	NONE	NONE	-
28	*ROAD	15'	4579'	NONE	NONE	NONE	-
29	*FENCE	4'	4567'	NONE	NONE	NONE	-
30	*ROAD	15'	4582'	NONE	NONE	NONE	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT TOP ELEVATIONS AND LOCATIONS ARE BASED ON A SURVEY BY: RED DESERT LAND SURVEYING, DATED: 9/15/2014.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)		0000 0000	THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			REIL
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	4125	N/A	CONTOURS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ROAD
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			MARKINGS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	X	XX	FENCE
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			CUT / FILL
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			POWER POLE
		TO BE REMOVED			

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

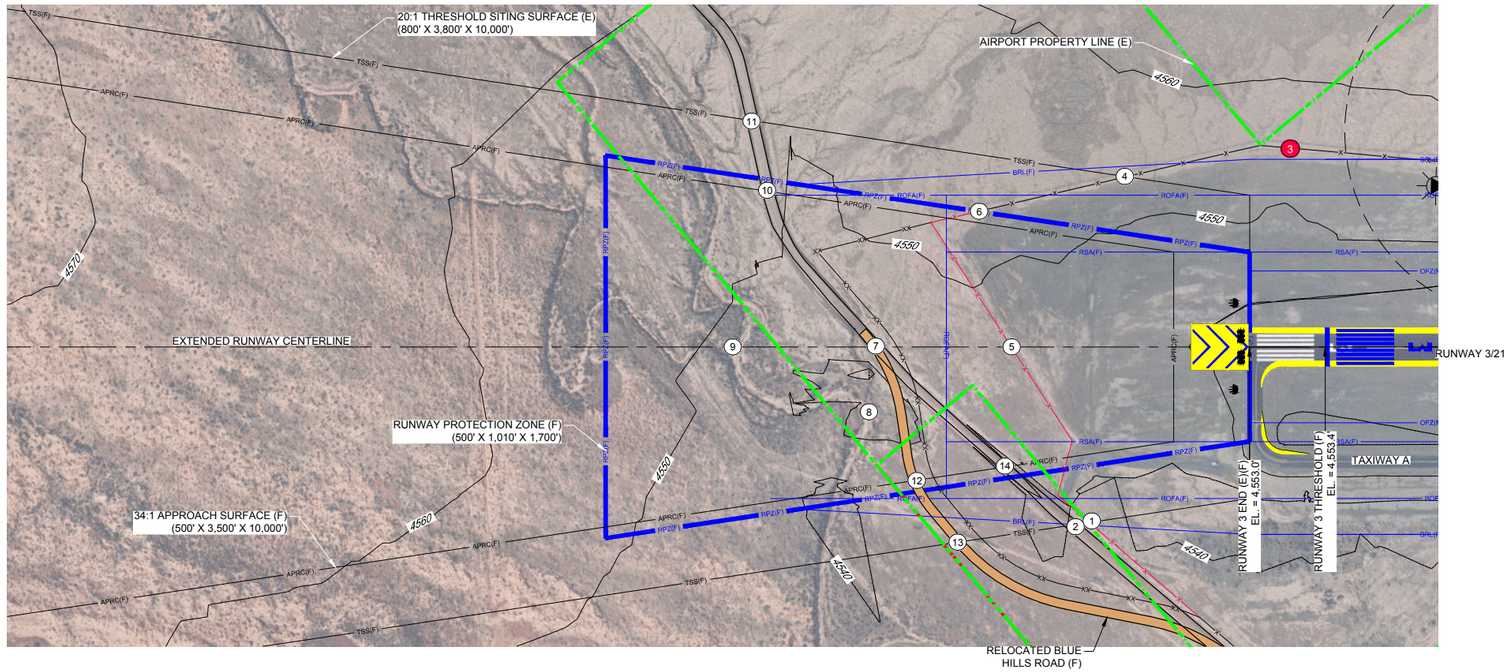
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

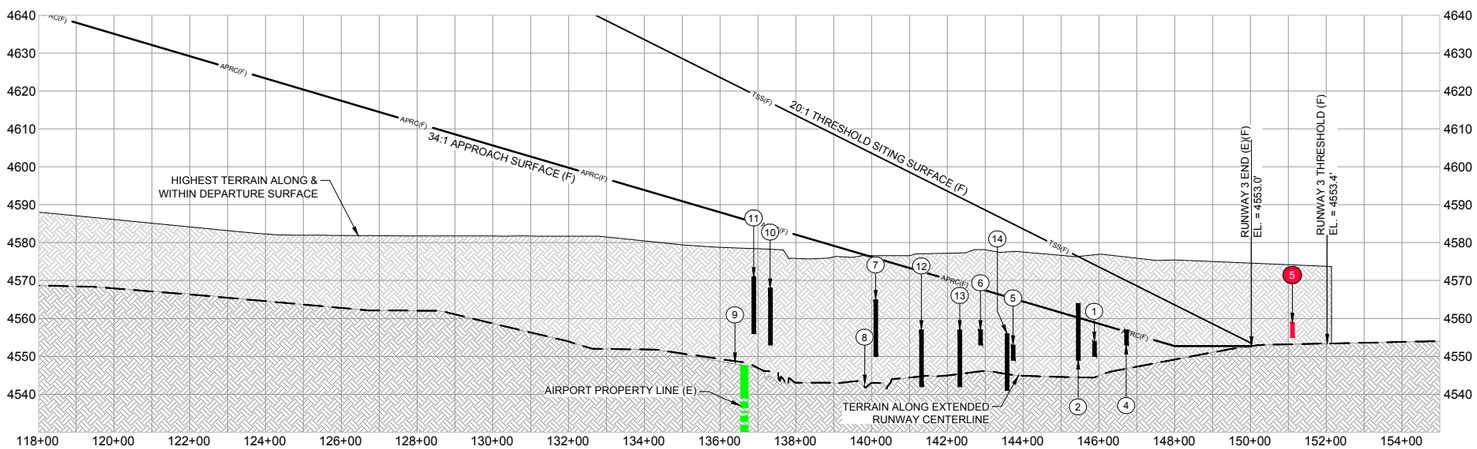
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THE INFORMATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT OFFICIAL FAA POLICY IN ALL RESPECTS AND DO NOT IN THE EVENT OF CONFLICT, SUPERSEDE ANY FEDERAL LAW, REGULATION, OR ADMINISTRATIVE POLICY. THE DISTRIBUTION OF THIS DOCUMENT DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DESCRIBED THEREIN. THE VIEWS AND OPINIONS OF AUTHORS EXPRESSED HEREIN DO NOT NECESSARILY STATE OR REFLECT THOSE OF THE UNITED STATES GOVERNMENT. THIS DOCUMENT IS DISTRIBUTED UNDER THE STATE OF UTAH'S FREEDOM OF INFORMATION ACT AND MAY NOT BE REPRODUCED OR DISTRIBUTED TO THE PUBLIC EXCEPT AS PROVIDED BY THE UAPIC LIST PROCEDURE IN ACCORDANCE WITH APPROPRIATE PUBLIC USE. DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD MITIGATE TO ACCEPTABLE LEVELS.

RUNWAY 21
INNER
APPROACH
PLAN (E)



PLAN - RUNWAY 3 (F)



PROFILE - RUNWAY 3 (F)

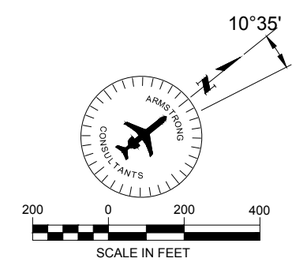
OBJECTS WITHIN RUNWAY 3, APRC, TSS AND DEPARTURE SURFACES (F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	REMARKS
1	*FENCE	4'	4545'	NONE	-	-
2	*ROAD	15'	4554'	NONE	-	-
3	*FENCE	4'	4555'	-	-	SEE NOTE 2
4	*FENCE	4'	4556'	NONE	-	-
5	*FENCE	4'	4549'	NONE	NONE	-
6	*FENCE	4'	4557'	NONE	NONE	-
7	*ROAD	15'	4558'	NONE	NONE	-
8	*DRAINAGE @ CRITICAL POINT	-	-	NONE	NONE	-
9	*DRAINAGE @ C/L	-	-	NONE	NONE	-
10	*ROAD	15'	4568'	NONE	NONE	-
11	*ROAD	15'	4566'	NONE	-	-
12	*ROAD	15'	4557'	NONE	NONE	-
13	*ROAD	15'	4557'	NONE	-	-
14	*ROAD	15'	4557'	NONE	NONE	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
\- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION;
N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE;
TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)		0000 0000	THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			REIL
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	4125	N/A	CONTOURS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ROAD
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			MARKINGS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	X	XX	FENCE
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			CUT / FILL
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			TO BE REMOVED

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

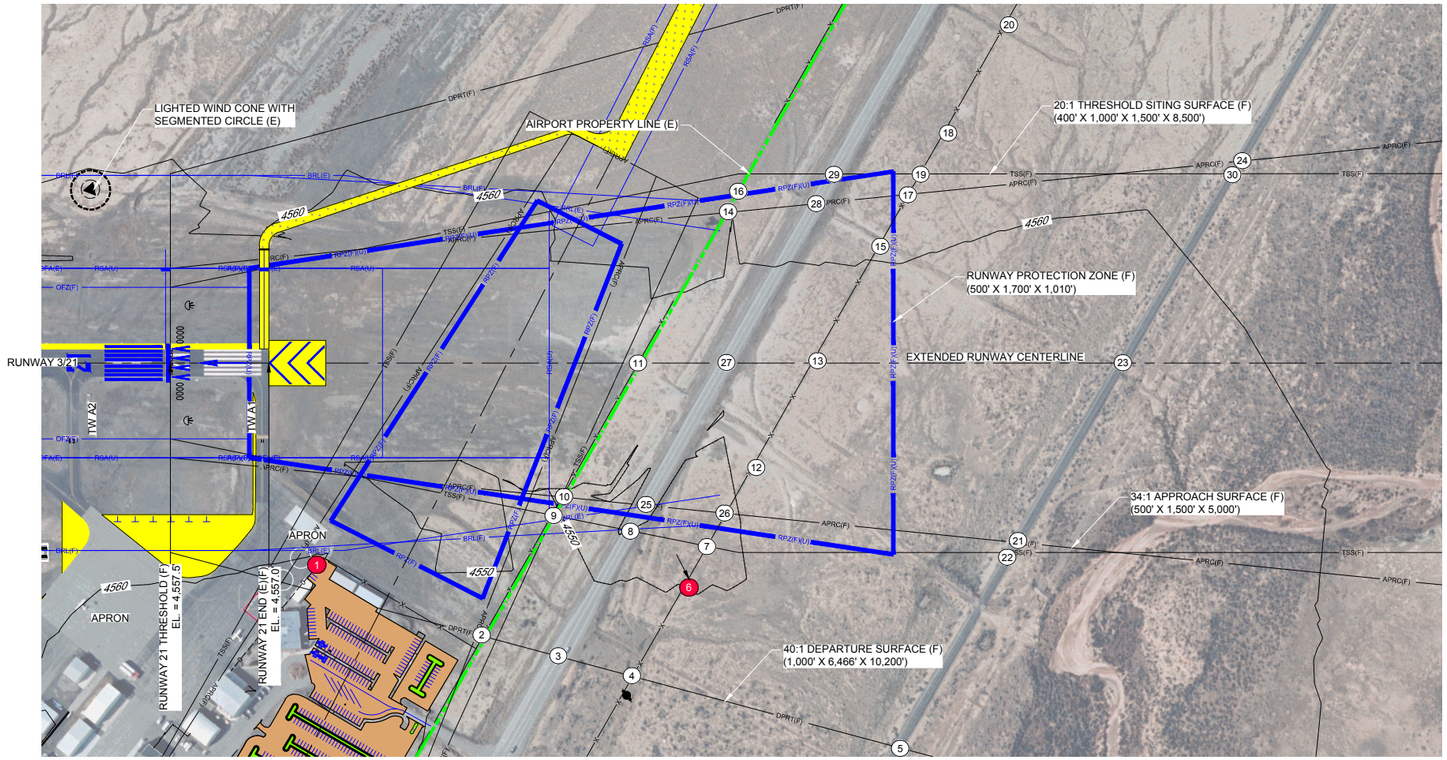
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

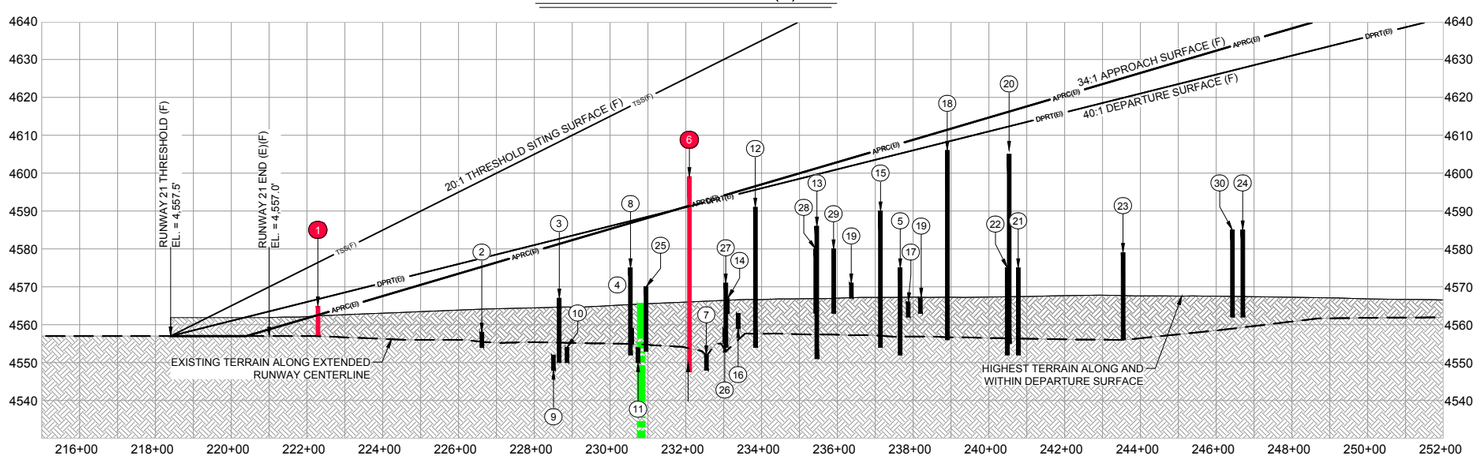
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THE INFORMATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE JUSTIFIABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY 3
INNER
APPROACH
(F)



PLAN - RUNWAY 21 END (F)



PROFILE - RUNWAY 21 (F)

PER GRID

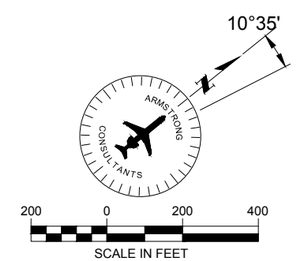
OBJECTS WITHIN RUNWAY 21, APRC, TSS AND DEPARTURE SURFACES (F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
1	*FENCE	8'	4568'	-	-	+7'	SEE NOTE 1
2	*FENCE	4'	4558'	-	NONE	NONE	-
3	*ROAD	17'	4571'	-	NONE	-	-
4	*FENCE	4'	4555'	-	-	NONE	-
5	*RAILWAY	23'	4575'	-	-	NONE	-
6	**POWER POLE	51.5'	4599'	-	-	+15'	SEE NOTE 2
7	*FENCE	4'	4550'	NONE	-	NONE	-
8	*ROAD	17'	4569'	NONE	-	NONE	-
9	*FENCE	4'	4554'	NONE	-	NONE	-
10	*FENCE	4'	4554'	NONE	NONE	NONE	-
11	*FENCE	4'	4554'	NONE	NONE	NONE	-
12	**POWER POLE	37'	4591'	NONE	NONE	NONE	-
13	**POWER POLE	35'	4586'	NONE	NONE	NONE	-
14	*FENCE	4'	4567'	NONE	NONE	NONE	-
15	**POWER POLE	36'	4590'	NONE	NONE	NONE	-
16	*FENCE	4'	4566'	NONE	-	NONE	-
17	*FENCE	4'	4566'	NONE	NONE	NONE	-
18	**POWER POLE	50'	4606'	NONE	-	NONE	-
19	*FENCE	4'	4567'	-	-	NONE	-
20	**POWER POLE	50'	4606'	-	-	NONE	-
21	*RAILWAY	23'	4575'	NONE	-	NONE	-
22	*RAILWAY	23'	4575'	NONE	NONE	NONE	-
23	*RAILWAY	23'	4579'	NONE	NONE	NONE	-
24	*RAILWAY	23'	4585'	NONE	NONE	NONE	-
25	*ROAD	17'	4570'	NONE	NONE	NONE	-
26	*FENCE	4'	4554'	NONE	NONE	NONE	-
27	*ROAD	17'	4571'	NONE	NONE	NONE	-
28	*ROAD	17'	4579'	NONE	NONE	NONE	-
29	*ROAD	17'	4580'	NONE	-	NONE	-
30	*RAILROAD	23'	4585	-	-	NONE	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT TOP ELEVATIONS AND LOCATIONS ARE BASED ON A SURVEY BY: RED DESERT LAND SURVEYING, DATED: 9/15/2014.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)		0000 0000	THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			REIL
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	4125	N/A	CONTOURS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ROAD
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			MARKINGS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	X	XX	FENCE
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			CUT / FILL
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			POWER POLE
		TO BE REMOVED			

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

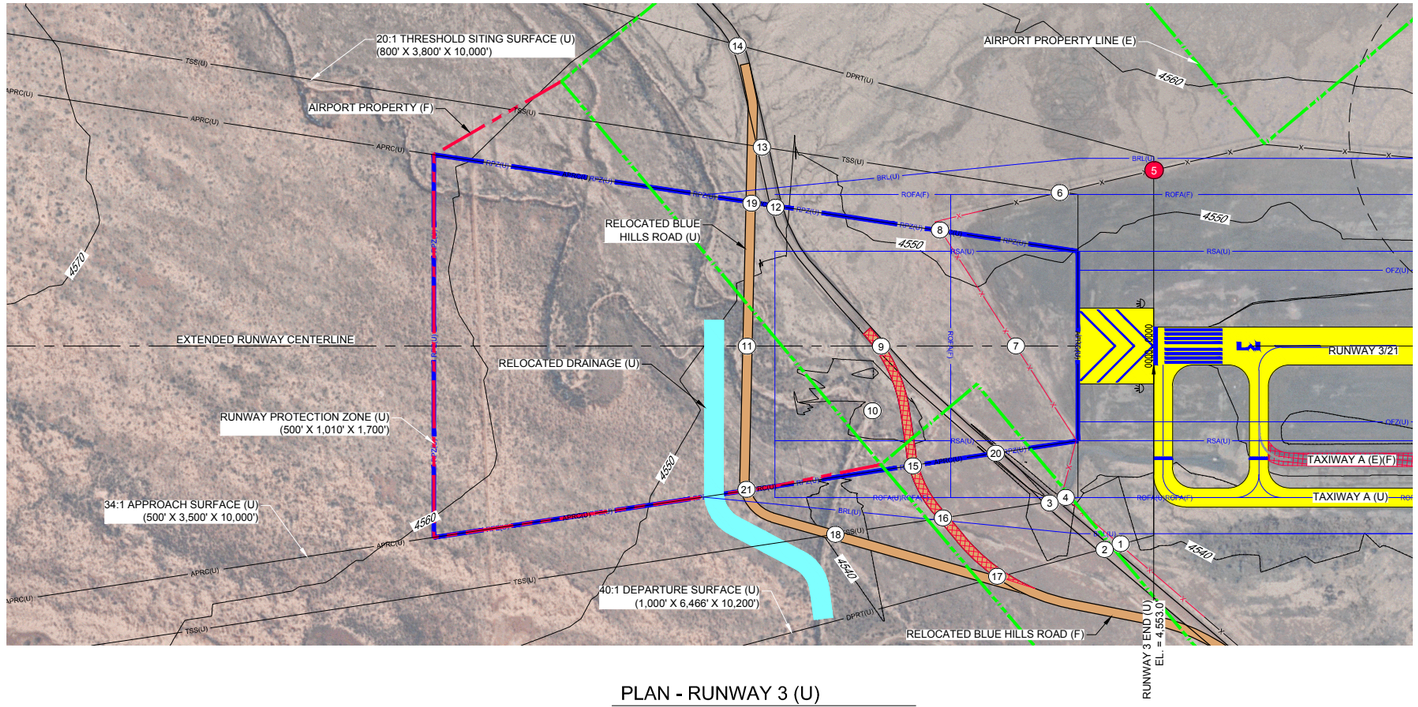
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

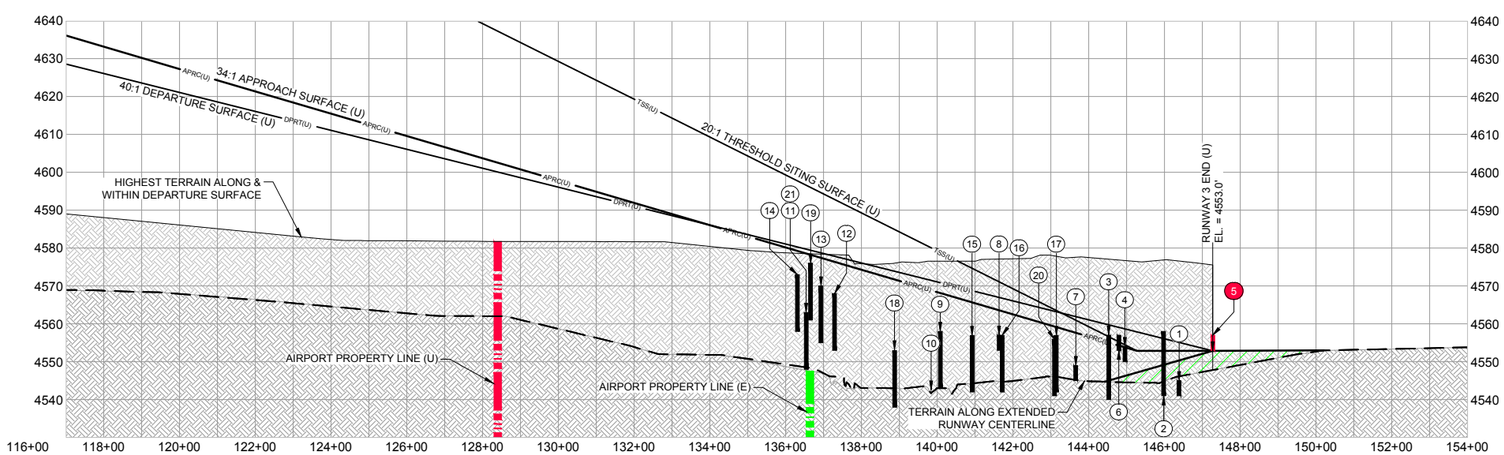
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS, OPINIONS, FINDINGS AND CONCLUSIONS PRESENTED IN THIS DOCUMENT ARE THOSE OF ARMSTRONG CONSULTANTS, INC. AND DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DESCRIBED HEREIN. ARMSTRONG CONSULTANTS, INC. ASSUMES NO LIABILITY FOR ANY DECISIONS MADE OR ACTIONS TAKEN BASED UPON THIS DOCUMENT. ANY JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS, REGULATIONS, DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE NO SIGNIFICANT IMPACTS.

RUNWAY 21 INNER APPROACH (F)



PLAN - RUNWAY 3 (U)



PROFILE - RUNWAY 3 (U)

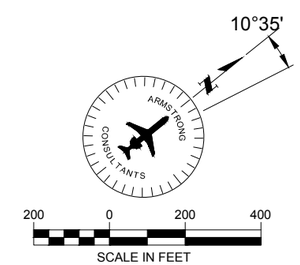
OBJECTS WITHIN RUNWAY 3, APRC, TSS AND DEPARTURE SURFACES (U)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
1	*FENCE	4'	4545'	-	-	NONE	SEE NOTE 1
2	*ROAD	15'	4558'	-	-	NONE	-
3	*ROAD	15'	4557'	NONE	-	NONE	-
4	*FENCE	4'	4544'	NONE	-	NONE	-
5	*FENCE	4'	4557'	-	-	+4'	SEE NOTE 2
6	*FENCE	4'	4557'	NONE	-	NONE	-
7	*FENCE	4'	4549'	NONE	NONE	NONE	-
8	*FENCE	4'	4557'	NONE	NONE	NONE	-
9	*ROAD	15'	4558'	NONE	NONE	NONE	-
10	*DRAINAGE @ CRITICAL POINT	-	-	NONE	NONE	NONE	-
11	*ROAD	15'	4563'	NONE	NONE	NONE	-
12	*ROAD	15'	4568'	NONE	NONE	NONE	-
13	*ROAD	15'	4570'	NONE	-	NONE	-
14	*ROAD	15'	4573'	-	-	NONE	-
15	*ROAD	15'	4557'	NONE	NONE	NONE	-
16	*ROAD	15'	4557'	NONE	-	NONE	-
17	*ROAD	15'	4557'	-	-	NONE	-
18	*ROAD	15'	4553'	NONE	-	NONE	-
19	*ROAD	15'	4568'	NONE	NONE	NONE	-
20	*ROAD	15'	4556'	NONE	NONE	NONE	-
21	*ROAD	15'	4563'	NONE	NONE	NONE	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION;
N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE;
TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)	GQS(E)	GQS(F)	GLIDE PATH QUALIFICATION SURFACE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)		0000 0000	THRESHOLD LIGHTS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			REIL
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	4125	N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROAD
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	X	XX	FENCE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			CUT / FILL
		TO BE REMOVED			

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

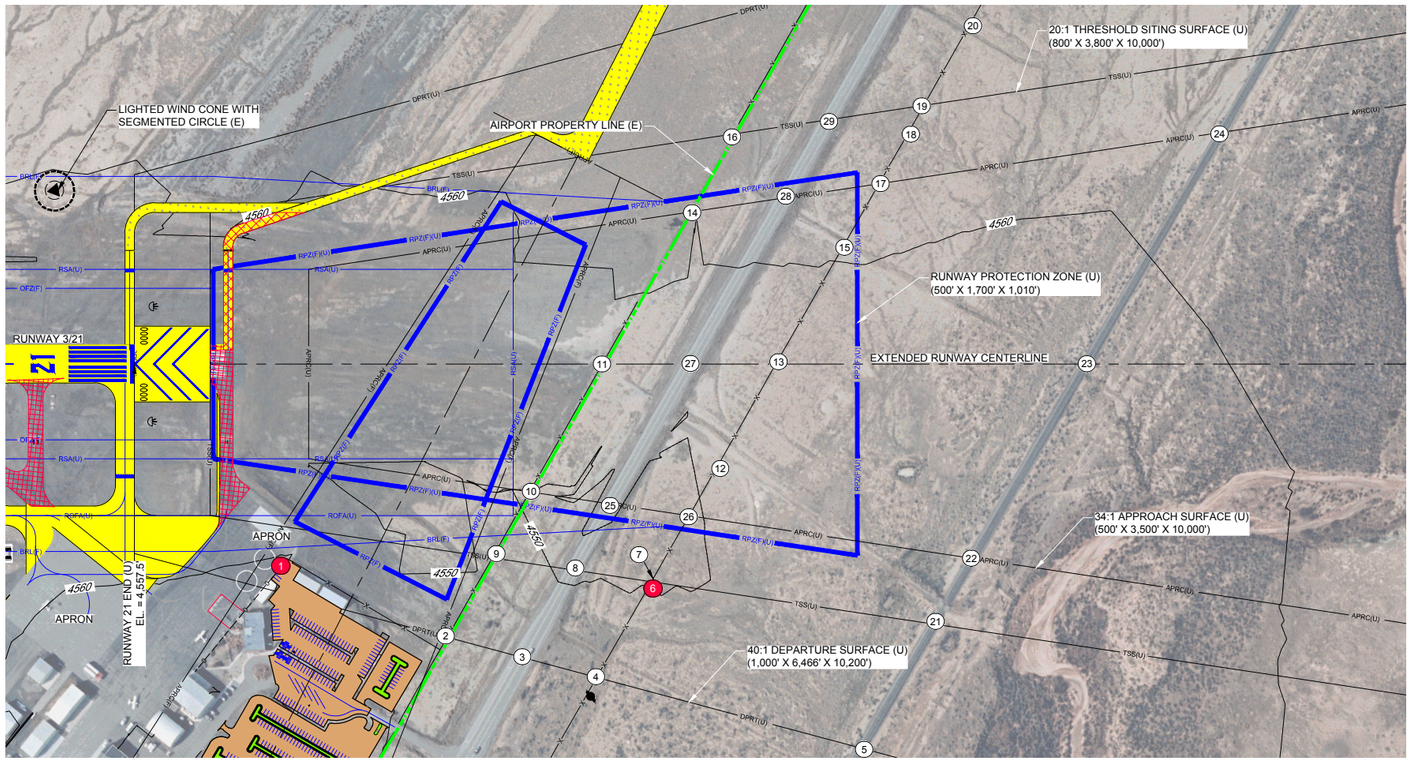
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

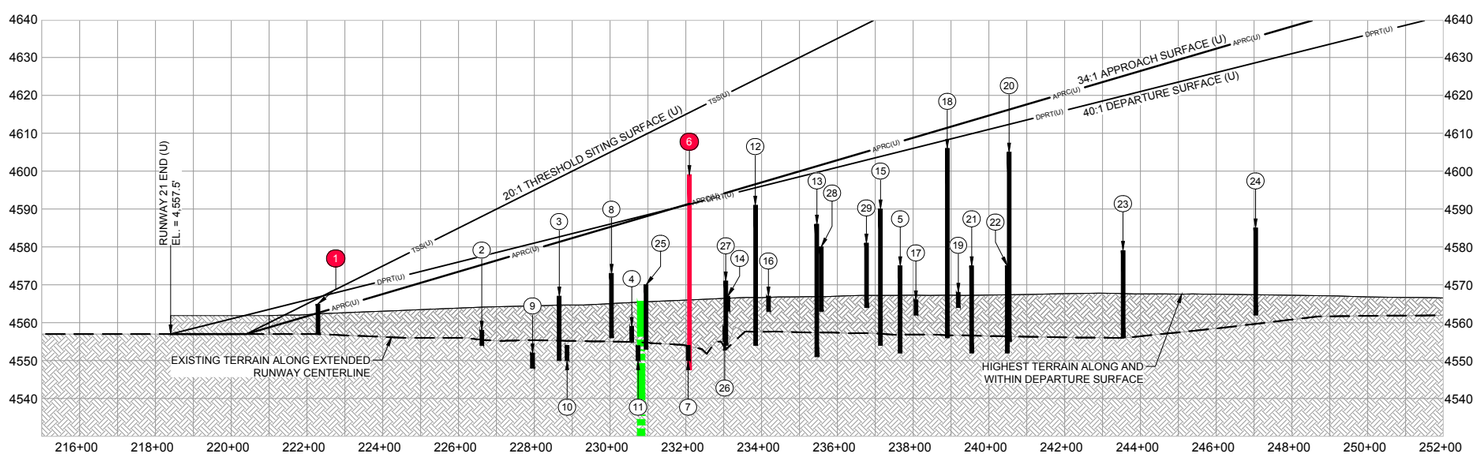
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THE INFORMATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE JUSTIFIED IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY 3
INNER
APPROACH
(U)



PLAN - RUNWAY 21 END (U)



PROFILE - RUNWAY 21 (U)

PER GRID

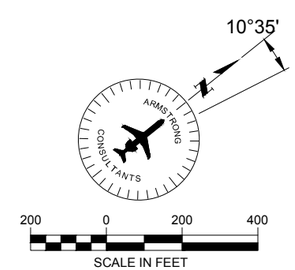
OBJECTS WITHIN RUNWAY 21, APRC, TSS AND DEPARTURE SURFACES (U)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
1	*FENCE	8'	4568'	-	-	+7'	SEE NOTE 1
2	*FENCE	4'	4558'	-	NONE	NONE	-
3	*ROAD	17'	4571'	-	NONE	-	-
4	*FENCE	4'	4555'	-	-	NONE	-
5	*RAILWAY	23'	4575'	-	-	NONE	-
6	**POWER POLE	51.5'	4599'	-	-	+15'	SEE NOTE 2
7	*FENCE	4'	4552'	NONE	-	NONE	-
8	*ROAD	17'	4567'	NONE	-	NONE	-
9	*FENCE	4'	4554'	NONE	-	NONE	-
10	*FENCE	4'	4554'	NONE	NONE	NONE	-
11	*FENCE	4'	4554'	NONE	NONE	NONE	-
12	**POWER POLE	37'	4591'	NONE	NONE	NONE	-
13	**POWER POLE	35'	4586'	NONE	NONE	NONE	-
14	*FENCE	4'	4567'	NONE	NONE	NONE	-
15	**POWER POLE	36'	4590'	NONE	NONE	NONE	-
16	*FENCE	4'	4567'	NONE	-	NONE	-
17	*FENCE	4'	4566'	NONE	NONE	NONE	-
18	**POWER POLE	50'	4606'	NONE	-	NONE	-
19	*FENCE	4'	4571'	-	-	NONE	-
20	**POWER POLE	50'	4606'	-	-	NONE	-
21	*RAILWAY	23'	4579'	NONE	-	NONE	-
22	*RAILWAY	23'	4575'	NONE	NONE	NONE	-
23	*RAILWAY	23'	4579'	NONE	NONE	NONE	-
24	*RAILWAY	23'	4585'	NONE	NONE	NONE	-
25	*ROAD	17'	4570'	NONE	NONE	NONE	-
26	*FENCE	4'	4554'	NONE	NONE	NONE	-
27	*ROAD	17'	4571'	NONE	NONE	NONE	-
28	*ROAD	17'	4579'	NONE	NONE	NONE	-
29	*ROAD	17'	4581'	NONE	-	NONE	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT TOP ELEVATIONS AND LOCATIONS ARE BASED ON A SURVEY BY: RED DESERT LAND SURVEYING, DATED: 9/15/2014.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)	GQS(E)	GQS(F)	GLIDE PATH QUALIFICATION SURFACE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)		0000 0000	THRESHOLD LIGHTS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			REIL
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	4125	N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROAD
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	X	XX	FENCE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			CUT / FILL
		TO BE REMOVED			

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

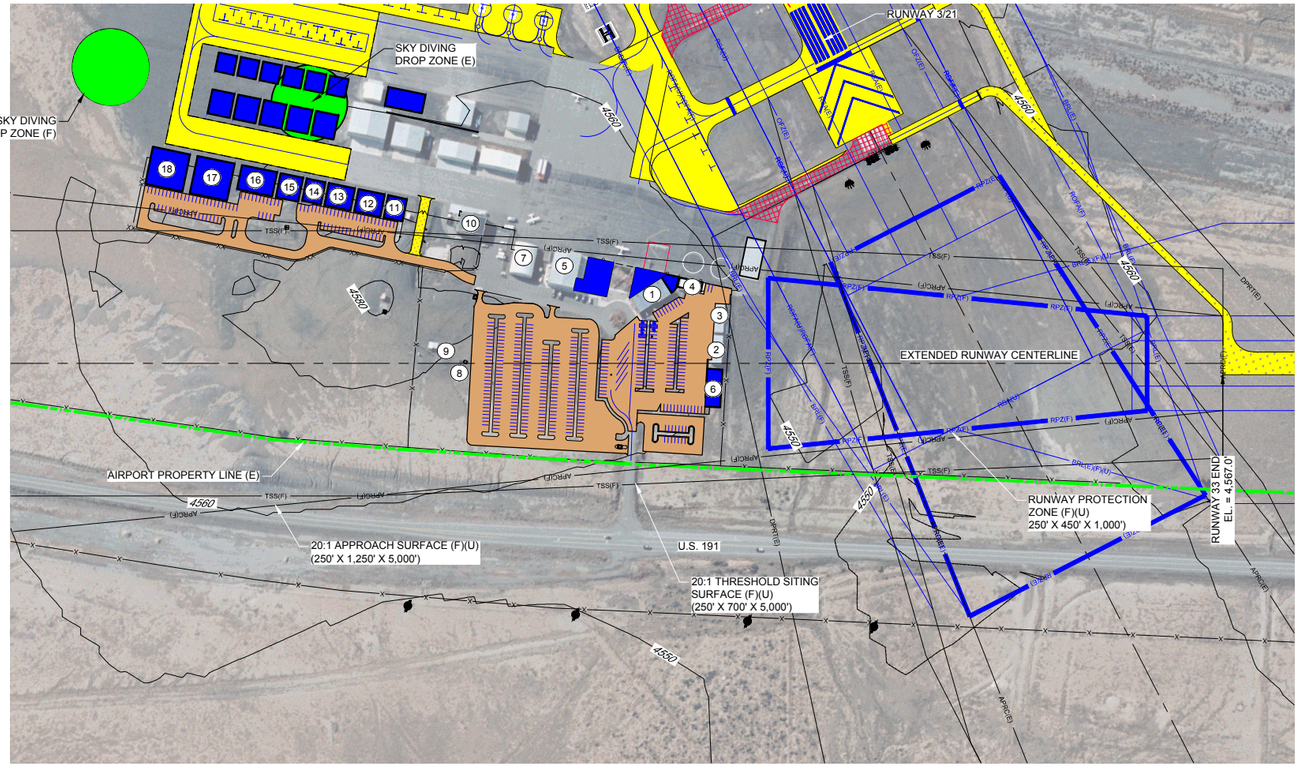
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

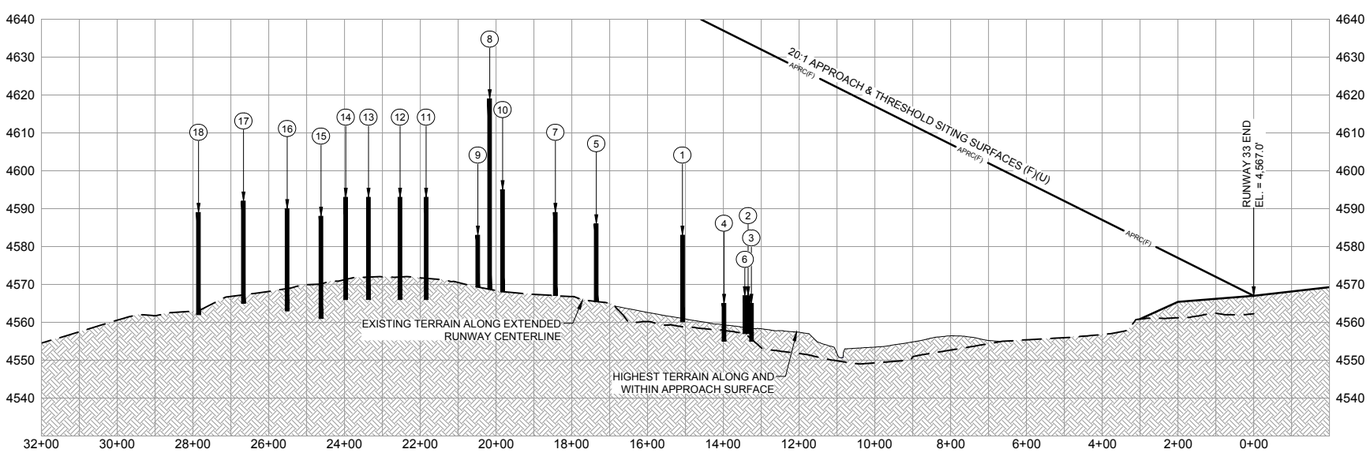
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THE REPRODUCTION OF THIS EXHIBIT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS EXHIBIT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE JUSTIFIED IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY 21
INNER
APPROACH
(U)



PLAN - RUNWAY 33 (F)(U)



PROFILE - RUNWAY 33 (F)(U)

PER GRID

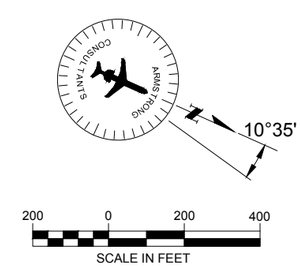
OBJECTS WITHIN RUNWAY 33, APRC, AND TSS SURFACES (F)(U)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
1	*TERMINAL/FBO	20'	4583'	-59'	-59'	-
2	*PARKING GARAGE	10'	4567'	-66'	-66'	-
3	*PARKING GARAGE	10'	4565'	-67'	-67'	-
4	*PARKING GARAGE	10'	4565'	-70'	-70'	-
5	*HANGAR	18'	4586'	-67'	-67'	-
6	*PARKING GARAGE	10'	4567'	-67'	-67'	-
7	*BOX HANGAR	22'	4589'	-70'	-70'	-
8	*BEACON	49'	4619'	-48'	-48'	-
9	* PUMP HOUSE	12'	4583'	-86'	-86'	-
10	*ARFF STATION	27'	4595'	-71'	-71'	-
11	*BOX HANGAR	27'	4593'	-	-83'	-
12	*BOX HANGAR	27'	4593'	-	-86'	-
13	*BOX HANGAR	27'	4593'	-	-90'	-
14	*BOX HANGAR	27'	4593'	-	-93'	-
15	*BOX HANGAR	27'	4588'	-	-102'	-
16	*BOX HANGAR	27'	4590'	-	-104'	-
17	*BOX HANGAR	27'	4592'	-	-108'	-
18	*BOX HANGAR	27'	4589'	-	-117'	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT TOP ELEVATIONS AND LOCATIONS ARE BASED ON A SURVEY BY: RED DESERT LAND SURVEYING, DATED: 9/15/2014.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)		0000 0000	THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			REIL
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	4125	N/A	CONTOURS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ROAD
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			MARKINGS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	X	XX	FENCE
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			CUT / FILL
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			POWER POLE
		TO BE REMOVED			

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

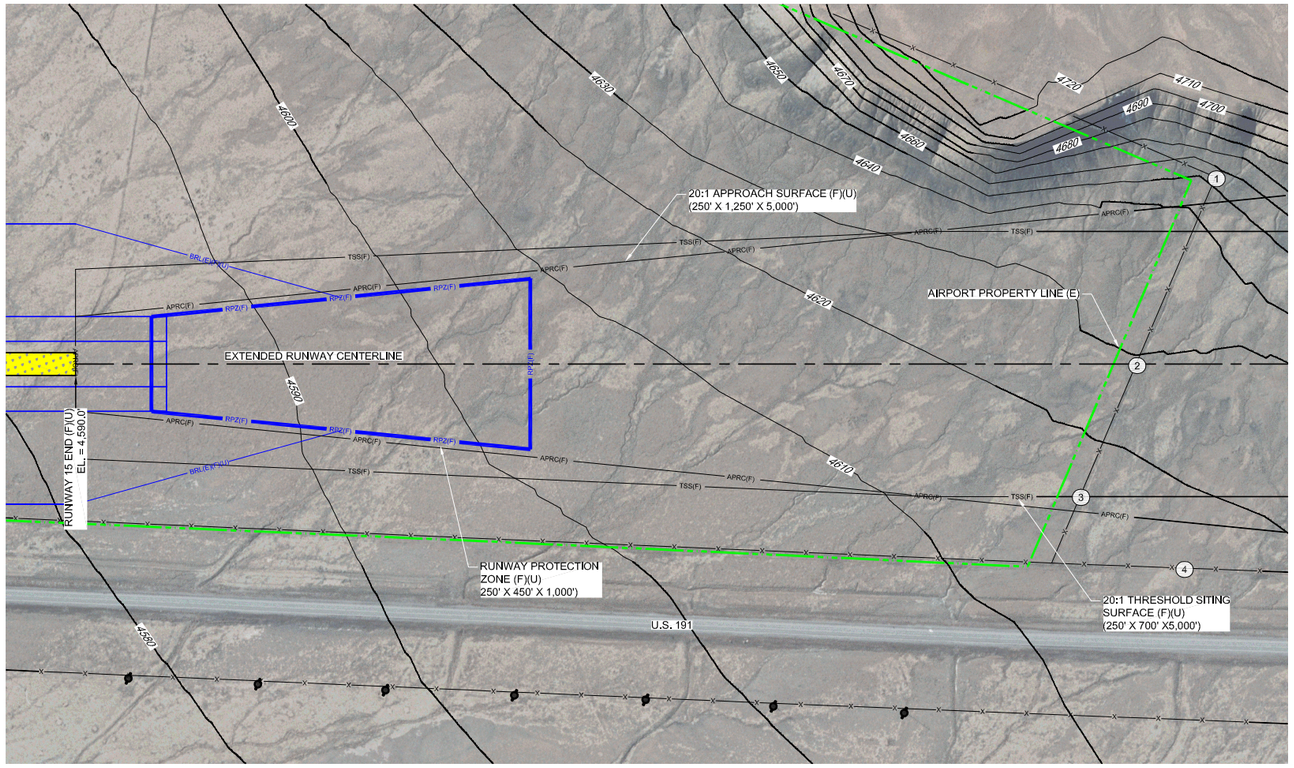
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

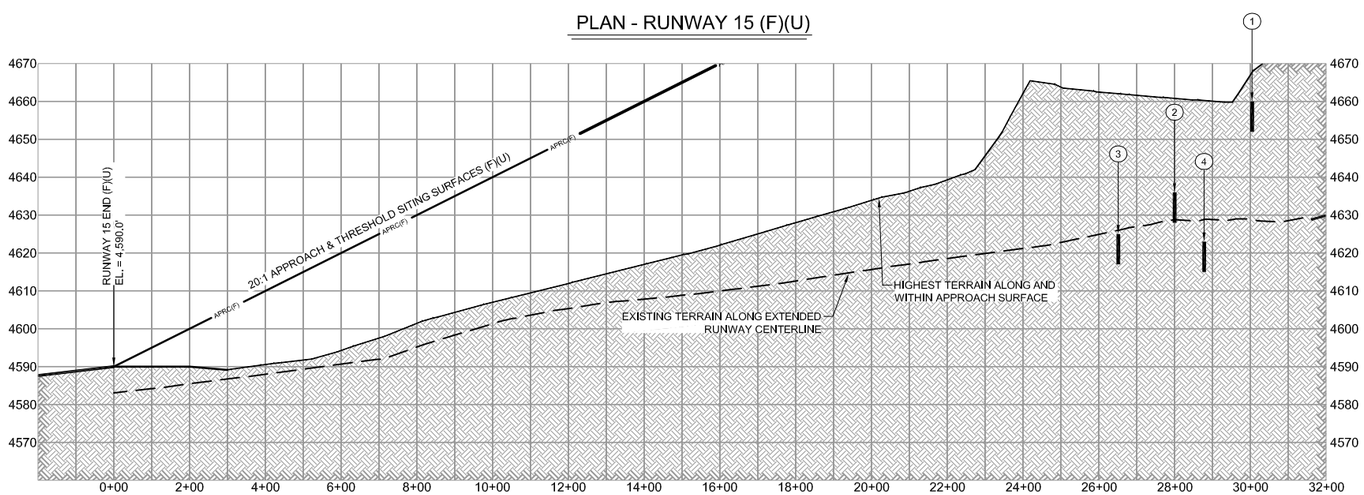
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THIS INFORMATION OR THIS DOCUMENT MAY, MAY BE BE SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS, VIEWS, POLICIES, AND CONCLUSIONS EXPRESSED OR IMPLIED IN THIS DOCUMENT ARE THOSE OF THE AUTHOR AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE FEDERAL AVIATION ADMINISTRATION. THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE ELIGIBLE FOR FEDERAL FUNDING.

RUNWAY 33
INNER
APPROACH
PLAN (F)(U)



PLAN - RUNWAY 15 (F)(U)



PROFILE - RUNWAY 15 (F)(U)

PER GRID

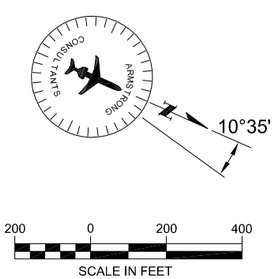
OBJECTS WITHIN RUNWAY 15, APRC, AND TSS SURFACES (F)(U)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
1	*FENCE	8'	4660'	-	-80'	-
2	*FENCE	8'	4636'	-94'	-94'	-
3	*FENCE	8'	4625'	-97'	-97'	-
4	*FENCE	8'	4623'	-	-110'	-

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT TOP ELEVATIONS AND LOCATIONS ARE BASED ON A SURVEY BY: RED DESERT LAND SURVEYING, DATED: 9/15/2014.
\- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	APRC(E)	APRC(F)	APPROACH SURFACE
		STRUCTURE/FACILITIES (BUILDING)	DPRT(E)	DPRT(F)	DEPARTURE SURFACE
		GRAVEL / TURF / DIRT	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		AIRPORT PROPERTY LINE (APL)			THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			REIL
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	4125	N/A	CONTOURS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ROAD
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			MARKINGS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	X	XX	FENCE
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			CUT / FILL
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			POWER POLE
		TO BE REMOVED			

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

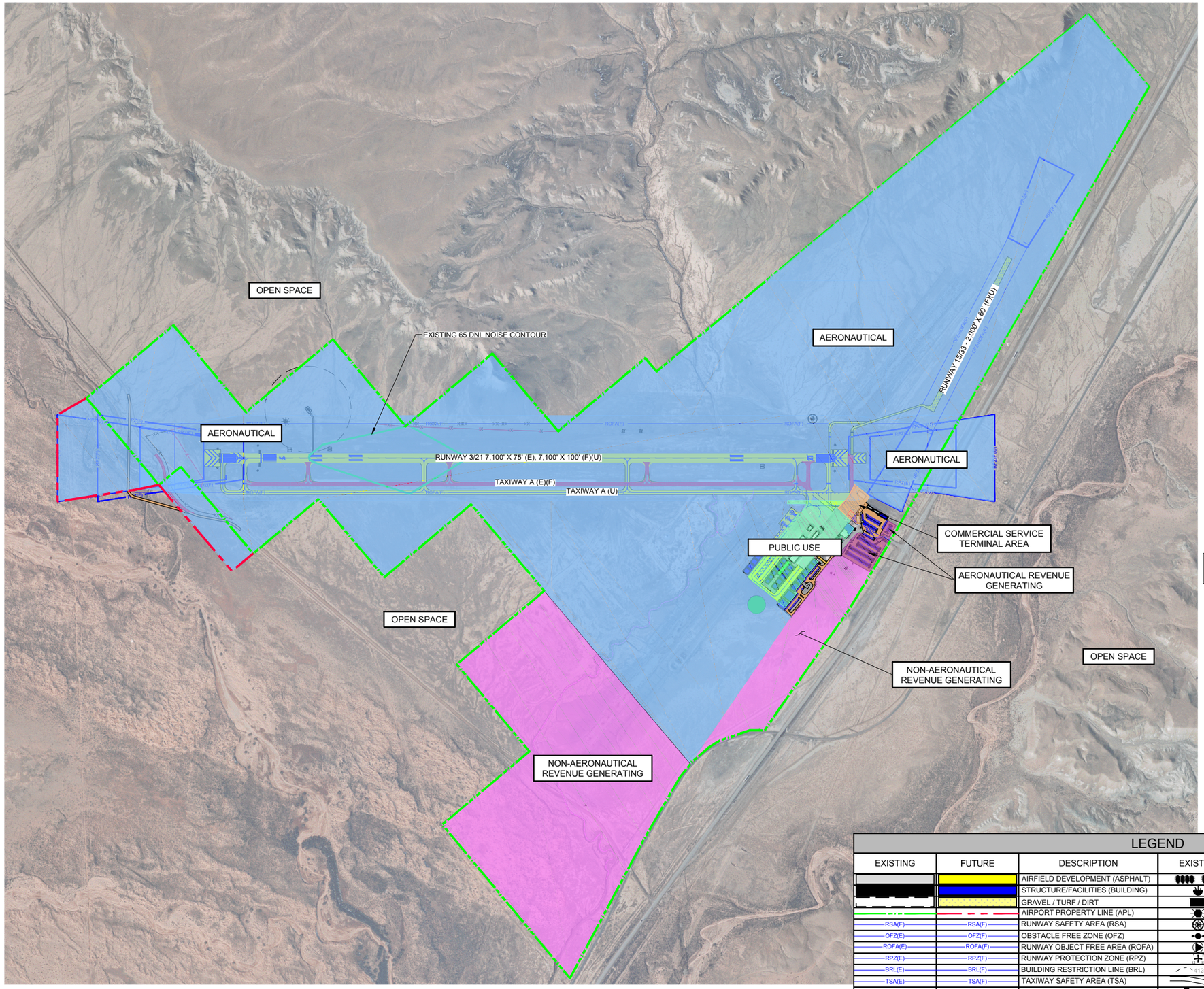
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
0	146251	09/2015	ORIGINAL ISSUE	6251505	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY 15
INNER
APPROACH
PLAN (F)(U)



LEGEND

- AERONAUTICAL
- GENERAL AVIATION / PUBLIC USE
- COMMERCIAL SERVICE TERMINAL AREA
- AERONAUTICAL REVENUE GENERATING
- NON-AERONAUTICAL REVENUE GENERATING

NOTE:
SEE CHAPTER FOUR - FACILITIES REQUIREMENTS FOR ADDITIONAL INFORMATION REGARDING NON-AERONAUTICAL LAND USE RELEASE

N

ARMSTRONG CONSULTANTS

600 0 600 1200

SCALE IN FEET

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	4125	N/A	CONTOURS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			ROADS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)			FENCING
		PACS/SACS MONUMENT			HELICOPTER PARKING
		65 DNL CONTOUR			TO BE REMOVED

NOTE: LEGEND DEPICTS ALP DEVELOPMENT, HOWEVER ALL SYMBOLS MAY NOT BE ON ALL PLAN SHEETS.

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

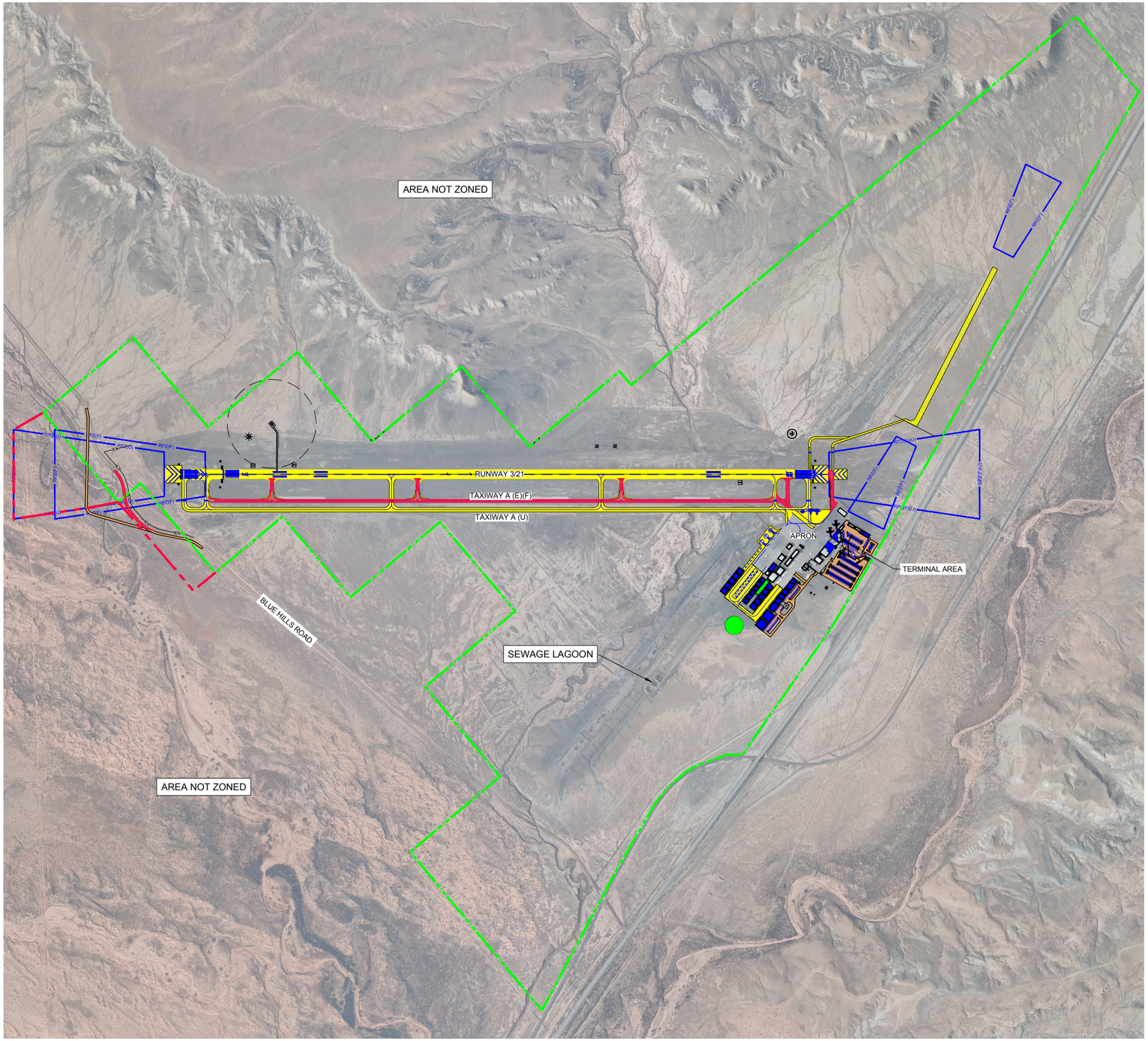
CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Dwn.	Chkd.	Apprv'd.
0	146251	09/2015	ORIGINAL ISSUE	6251506	GWK	JMR	JZP

THIS DOCUMENT, THROUGH ACCEPTANCE, IS SUBMITTED WITH THE UNDERSTANDING THAT THE FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IMPLY ITS APPROVAL OF THE PROJECTS DESCRIBED THEREIN. NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE ELIGIBLE FOR FEDERAL FUNDING ASSISTANCE UNDER THE PROJECT.

ON AIRPORT LAND USE



ORDINANCES IN EFFECT

NONE

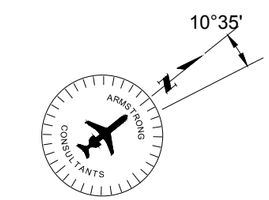
NOTICE OF PROPOSED CONSTRUCTION

An FAA Form 7460-1, "Notice of Proposed Construction or Alteration" must be submitted for any construction or alteration (including hangars and other on-airport and off-airport structures, towers, etc.) within 20,000 horizontal feet of the airport greater in height than an imaginary surface extending outward and upward from the runway at a slope of 100 to 1 or greater in height than 200 feet above ground level.

NOTES

No land fills within 5 miles of the airport.

No Section 4(F) land affected by the airport.



MAGNETIC NORTH SOURCE:
NOAA GEOPHYSICAL DATA CENTER
MAGNETIC DECLINATION 10°35' EAST
RATE OF CHANGE 0°6' WEST PER YEAR
OBTAINED: 02/26/15

600 0 600 1200
SCALE IN FEET

LEGEND

- EXISTING AIRPORT PROPERTY LINE
- FUTURE AIRPORT PROPERTY LINE
- NO HAZARDOUS WILDLIFE ATTRACTANT RING
- FUTURE AIRFIELD ASPHALT
- FUTURE AIRFIELD MARKING
- TO BE REMOVED
- CHURCH
- HOSPITAL
- SCHOOL
- PARK

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	148251	09/2015	ORIGINAL ISSUE	b251507A	GWK	JMR	JZP

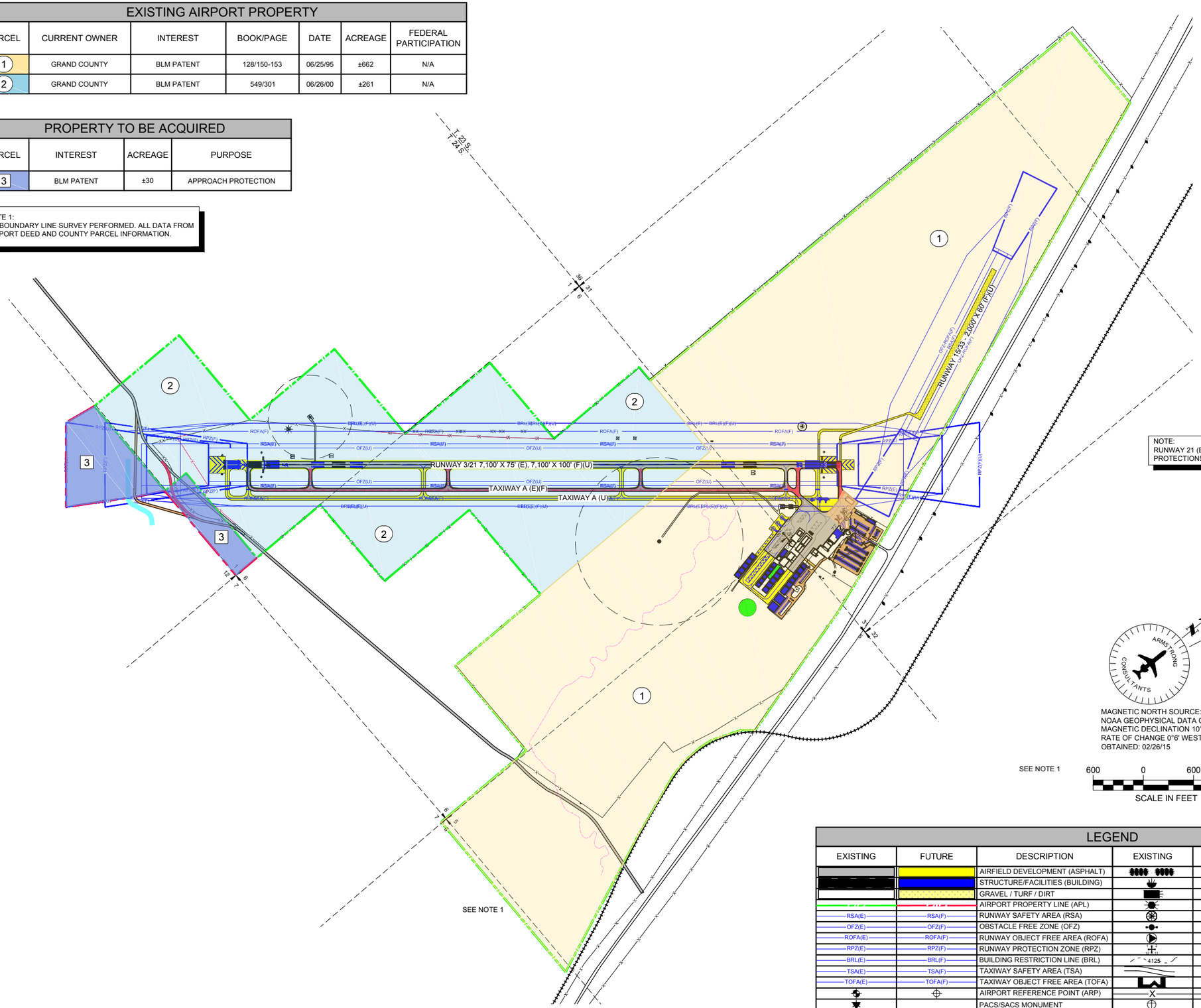
THIS DRAWING OR DOCUMENT WAS PREPARED WITH FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION. THROUGH FINANCIAL ASSISTANCE, THE FAA CONTRIBUTES TO AIRPORT PLANNING AND DEVELOPMENT AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IMPLY ITS APPROVAL OF THE PROJECT DESCRIBED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE ELIGIBLE FOR FEDERAL ASSISTANCE UNDER THE PROPERTY AND AIRPORT ACT.

OFF AIRPORT LAND USE

EXISTING AIRPORT PROPERTY						
PARCEL	CURRENT OWNER	INTEREST	BOOK/PAGE	DATE	ACREAGE	FEDERAL PARTICIPATION
1	GRAND COUNTY	BLM PATENT	128/150-153	06/25/95	±662	N/A
2	GRAND COUNTY	BLM PATENT	549/301	06/26/00	±261	N/A

PROPERTY TO BE ACQUIRED			
PARCEL	INTEREST	ACREAGE	PURPOSE
3	BLM PATENT	±30	APPROACH PROTECTION

NOTE 1:
NO BOUNDARY LINE SURVEY PERFORMED. ALL DATA FROM AIRPORT DEED AND COUNTY PARCEL INFORMATION.



NOTE:
RUNWAY 21 (E)(F)(U) NOT SHOWN TO BE ACQUIRED DUE TO PROTECTIONS FROM ROADWAY / RAILROAD RIGHT-OF-WAYS

10°35'

MAGNETIC NORTH SOURCE:
NOAA GEOPHYSICAL DATA CENTER
MAGNETIC DECLINATION 10°35' EAST
RATE OF CHANGE 0°6' WEST PER YEAR
OBTAINED: 02/26/15

600 0 600 1200
SCALE IN FEET

LEGEND					
EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	4125	N/A	CONTOURS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			ROADS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)			FENCING
		PACS/SACS MONUMENT			HELICOPTER PARKING
					TO BE REMOVED

NOTE: LEGEND DEPICTS ALP DEVELOPMENT, HOWEVER ALL SYMBOLS MAY NOT BE ON ALL PLAN SHEETS.

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Dwn.	Chkd.	Apprvd.
0	146251	09/2015	ORIGINAL ISSUE	6251508	GWK	JMR	JZP

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHOM IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION BY ARMSTRONG CONSULTANTS, INC. IS PROHIBITED. ARMSTRONG CONSULTANTS, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF DESIGNS OR DATA FURNISHED BY THIRD PARTIES THAT ARE USED TO PREPARE THIS DOCUMENT. ARMSTRONG CONSULTANTS, INC. ASSUMES NO LIABILITY FOR ANY DECISIONS MADE OR ACTIONS TAKEN BASED ON THIS DOCUMENT WITHOUT PRIOR WRITTEN AUTHORIZATION FROM ARMSTRONG CONSULTANTS, INC.

EXHIBIT A
PROPERTY
INVENTORY
MAP

AERIAL PHOTOGRAPH TAKEN FEB. 2015 BY COOPER AERIAL SURVEY

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
GRAND JUNCTION, CO: 970.242.0101
DENVER, CO: 303.708.1747
PHOENIX, AZ: 602.803.7079
ALBUQUERQUE, NM: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprv'd
0	146251	09/2015	ORIGINAL ISSUE	6251509	GWK	JMR	JZP

THIS DOCUMENT WAS PREPARED WITH FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IMPLY ITS APPROVAL OF THE PROJECTS DESCRIBED OR DETERMINED. IT ALSO DOES NOT COMMIT THE FAA TO FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C. SECTION 47104. THE DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE EligIBLE FOR FEDERAL ASSISTANCE UNDER THE AIRPORT IMPROVEMENT PROGRAM.

AERIAL PHOTOGRAPH

CHAPTER SEVEN

ENVIRONMENTAL OVERVIEW

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER SEVEN
ENVIRONMENTAL OVERVIEW

7.1 Introduction

The protection and preservation of the local environment is an essential part of the airport master planning process. Council on Environmental Quality (CEQ) regulation 1501.2 states, "agencies shall integrate the NEPA process with other planning at the earliest possible time to insure that planning decisions reflect environmental values, avoid delays later in the process, and head off potential conflicts."

Accordingly, the environmental overview was conducted in accordance with FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures,* and the FAA's *Environmental Desk Reference for Airport Actions*, which requires the analysis of the following environmental resource categories prior to project implementation:

- Air Quality, including greenhouse gases (GHGs) and climate
- Biotic Resources/Federally-listed Endangered and Threatened Species
- Coastal Barriers and Coastal Zone Management
- Compatible Land Use/Noise
- Construction Impacts
- Cumulative Impacts
- Department of Transportation Act, Section 4(f)
- Energy Supplies, Natural Resources, and Sustainable Design
- Farmlands
- Floodplains
- Hazardous Materials
- Historical, Architectural, Archeological, and Cultural Resources
- Light Emissions and Visual Effects
- Secondary (Induced) Impacts
- Social Impacts/Environmental Justice
- Solid Waste
- Water Quality
- Wetlands
- Wild and Scenic Rivers

FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*, describes the types of impacts and thresholds that determine if an impact is considered to be significant. The proposed development projects will require a determination to be made regarding which of the following environmental clearance documents would be required prior to project implementation. These environmental clearance documents include the following:

- Categorical Exclusions – Projects or actions that do not normally require an EA or EIS because they do not individually or cumulatively have a significant effect on the environment.

- Environmental Assessment (EA) – Preparation of a concise document used to describe a proposed project's anticipated environmental impacts and mitigation measures.

- Environmental Impact Statement (EIS) – Preparation of a clear, concise, and appropriately detailed document that provides the FAA, decision makers, and the public with a full and fair discussion of significant environmental impacts of the proposed project and reasonable alternatives.

Ultimately, the FAA will determine whether the proposed development project constitutes a major federal action subject to NEPA, or whether it is a Categorical Exclusion from NEPA because it is not expected to have a significant adverse effect on the environment.

7.2 Environmental Overview

The purpose of an environmental overview is to identify significant thresholds for the resource categories contained in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementation Instructions for Airport Actions.* The environmental overview for Canyonlands Field is illustrated in **Table 7-1**.

Table 7-1 Environmental Overview for Canyonlands Field

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
Air Quality	The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SOx), Nitrogen Oxide (NOx), Particulate matter (PM10), and Lead (Pb). Areas that exceed allowable thresholds for criteria pollutants are designated "non-attainment" areas.	**No impacts** Grand County is not located in a non-attainment area. No significant air quality impacts are anticipated to occur as a result of the proposed development.	See **Appendix D-1**
Threatened or Endangered Species and Biological Resources	A significant impact to Federally-listed threatened and endangered species would occur when the FWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area.	**No impacts** The proposed projects are not anticipated to impact plant communities or cause the displacement of wildlife. No critical habitats have been identified for the areas of recommended development at Canyonlands Field.	See **Appendix D-2**

Table 7-1 Environmental Overview for Canyonlands Field

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
Coastal Barriers and Coastal Zone Management (CZM)	The Airport is not located within or adjacent to a coastal zone.	**No impacts** Airport is located in the State of Utah.	Not Applicable
Compatible Land Use/Noise	**Compatible Land Use**: Federal Aviation Regulations (F.A.R.) Part 150 recommends guidelines for planning land use compatibility within various levels of aircraft noise exposure. In addition, Advisory Circular 150/5200-33 identifies land uses that are incompatible with safe airport operations because of their propensity for attracting birds or other wildlife, which in turn results in an increased risk of aircraft strikes and damage. Finally, F.A.R. Part 77 regulates the height of structures within the vicinity of the airport. **Noise**: The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.	**Minor impacts** The proposed airport improvements are not anticipated to result in significant noise impacts, attract wildlife or interfere with Part 77 surfaces.	Not Applicable
Construction Impacts	Significant impacts would most likely occur when unusual circumstances exist (e.g. construction-induced traffic congestion that would substantially degrade air quality) and when the severity of the impact cannot be mitigated below FAA's threshold levels for the affected resource.	**Minor impacts** A temporary increase in particulate emissions and fugitive dust may result from construction activities. The provisions contained in FAA Advisory Circular 150/5370-10G, *Standards for Specifying Construction of Airports,* should be incorporated into all project specifications.	Not Applicable
Cumulative Impacts	The significance threshold for cumulative impacts varies according to the affected resource. Past, present, and reasonably foreseeable future actions trigger the significance threshold for the resource analyzed.	**No impacts** The proposed projects are not anticipated to cause a cumulative impact when considering past, present and foreseeable future projects.	Not Applicable
Department of Transportation (DOT) Act, Section 4(f)	**Section 4(f) Lands**. These include publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance, or any land from a historic site of national, state or local significance.	**No impacts** The nearest Section 4(f) property is located approximately three miles east. The extent of the recommended development would remain within immediate vicinity (≤ 0.50 miles) of Canyonlands Field.	See **Appendix D-3**

Table 7-1 Environmental Overview for Canyonlands Field

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
Energy Supplies, Natural Resources, and Sustainable Design	When proposed construction, operation, or maintenance would cause demands that would exceed available or future (project year) natural resource or energy supplies.	**No impacts**	
Farmlands	According to the Farmland Protection Policy Act, the regulation does not apply to land already committed to "urban development or water storage," i.e., airport developed areas, regardless of its importance as defined by the NRCS.	**No impacts** The airport and surrounding area are designated as Not Prime Farmland.	See **Appendix D-4**
Floodplains	When notable adverse impacts on natural and beneficial floodplain values would occur.	**No impacts** No FEMA Flood Insurance Rate Map is available for Canyonlands Field. Grand County indicates the possibility of floodplains at airport to be unlikely.	See **Appendix D-5**
Hazardous Materials	The action involves a property on, or eligible for, the National Priority List (NPL). The sponsor would have difficulty meeting applicable local, state, or Federal laws and regulations on hazardous materials. There is an unresolved issue regarding hazardous materials.	**No impacts**	Not Applicable
Historical, Architectural, Archaeological, and Cultural Resources	When an action adversely affects a protected property the state and /or tribal Historic Preservation Officer addressing alternatives to avoid adverse effects and mitigation warrants further study.	**Potential for Impacts** There is a potential for archaeological sites to be located southwest of the Runway 3 end. Coordination with the SHPO would be conducted prior to construction.	Not Applicable
Light Emissions and Visual Effects	**For light emissions:** When an action's light emissions create annoyance to or interfere with normal activities. **For visual effects:** When consultation with Federal, State or local agencies, tribes or the public shows these effects intrude on existing environments and the agencies state the effect is objectionable.	**Minor impacts** No significant light emissions or visual effects impacts are anticipated as a result of the proposed development.	Not Applicable
Secondary (Induced) Impacts	Induced impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts.	**No impacts**	Not Applicable
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health Risks and Safety Risks	**For socioeconomic issues:** When an action would cause: Extensive relocation, but sufficient replacement housing is unavailable. Extensive relocation of community businesses that would cause severe economic hardship for affected communities. Disruption of local traffic patterns that substantially reduce the Levels of Service of	**Socioeconomic Issues: Minor Impacts** There would be minor impacts to airport business during the temporary runway closure. **Environmental Justice: No impacts** **Children's Health & Safety:**	Not Applicable

Table 7-1 Environmental Overview for Canyonlands Field

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
	roads serving the airport and its surrounding communities. A substantial loss in community tax base. **For Environmental Justice issues:** When an action would cause disproportionately high and adverse human health or environmental effects on minority and low income populations, a significant impact may occur. **For Children's Health & Safety Risks:** An action causing disproportionate health and safety risks to children may indicate a significant impact.	**No impacts**	
Solid Waste	Solid waste generated during future project construction would be contained in designated areas and receptacles and removed once the project is completed. Pollution related to construction activities (i.e. dust) would be minimal and would not adversely affect the Airport as a whole.	**Minor impacts** Solid waste would likely be generated during construction of the recommended development. These impacts would only be during construction and would be temporary.	Not Applicable
Water Quality	When an action has the potential to exceed water quality standards, there are water quality problems that cannot be avoided or satisfactorily mitigated, or there would be difficulty in obtaining a permit or authorization, there may be a significant impact.	**Minor impacts** A drainage wash would need to be relocated or piped to accommodate the recommended development. No significant impacts are anticipated to occur.	Not Applicable
Wetlands	When an action would: Adversely affect a wetland's function to protect the quality or quantity of a municipal water supply. Substantially alter the hydrology needed to sustain the affected wetland's values and functions or those of a wetland to which it is connected. Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected area surrounding wetlands. Promote development of secondary activities or services that would affect the above functions.	**No impacts** Coordination with the U.S. Army Corps of Engineers would be conducted during future NEPA analysis to confirm no significant impacts would occur.	See **Appendix D-6**
Wild and Scenic Rivers	There are no wild or scenic rivers on or near	**No impacts**	See **Appendix D-7**

Table 7-1 Environmental Overview for Canyonlands Field

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
	future project areas.		

7.2.1 Summary of Potential Environmental Impacts

Table 7-1 provides a summary of the analysis ratings for each of the environmental impact categories with regard to the recommended development. While some categories indicate a potential minor impact, they are all estimated to be below the threshold of significance as described in FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Projects.* It is expected that most recommended development projects would be categorically excluded, with the exception of Airport Reference Code Upgrade, runway shift, taxiway shift and land acquisition projects, which would likely require an EA.

CHAPTER EIGHT

AIRPORT DEVELOPMENT AND FINANCIAL PLAN

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER EIGHT
AIRPORT DEVELOPMENT AND FINANCIAL PLAN

8.1 Introduction

The airport development plan and financial feasibility analysis provides a demonstration of the Airport's ability to fund the projects presented in the Airport Master Plan. The recommended capital plan for the Canyonlands Field is based on the facility requirements identified earlier in this report. The assumptions within this Chapter are contingent upon the Federal Aviation Administration (FAA), the continuation of the existing capital funding programs and the growth of the Airport's aviation activity as projected within the report.

A goal for Canyonlands Field is to be self-sustaining. The intrinsic value that a well-maintained airport brings to a community or region goes far beyond the day-to-day operational costs. In other words, the money spent and benefits received in the community or region by individuals or businesses that use the airport equals or exceeds the expenses, which are a result of operations at the Airport.

The principal objective of this Chapter is to assess the financial requirements of the proposed capital improvement projects for Canyonlands Field. The analysis covers a 20-year planning period including the initial-, intermediate-, and long-term goals and objectives. This Chapter provides costs and potential funding sources for capital projects and improvements proposed within this Airport Master Plan.

8.2 Capital Development

Potential funding sources for the recommended development projects indentified in Chapter Five, *Development Alternatives*, will be indentified in this Chapter. Funding sources come from the FAA, State and Local contribution. This section will identify and quantify the expected sources of capital funds. As previously indicated, FAA funds represent the majority of expected capital; however, a number of sources are identified and indicated below.

8.2.1 Federal Aviation Administration

In 2012, the FAA approved a Modernization and Reform Act extending the reauthorization bill through September 2015. The bill returned the federal/local matching ratio to 90.63 percent/9.37 percent for Airport Improvement Program (AIP) approved projects within the State of Utah. The previous bill provided a 95 percent/five percent federal/local matching ratio.

In 2015, Canyonlands Field was designated as an Essential Air Service airport serving an Economically Distressed Community (EDC). Due to this designation, Canyonlands Field is eligible for a 95 percent federal funding level. UDOT has indicated they will split the remaining

five percent match with Grand County. This reduces the local match at Canyonlands Field to 2.5 percent creating a 95/2.5/2.5 matching ratio. The EDC designation is evaluated yearly and is subject to change for future planning purposes. If Moab is not listed as an EDC, the funding match ratio will revert to a 90.63/4.685/4.685 split. The 20-Year Financial Development Plan will evaluate funding requirements with and without the EDC designation.

The FAA levies user charges on aviation that are returned to airports to pay for eligible projects. There are three types of FAA funding that may be used to pay for the recommended Airport Master Plan projects; each is described below.

- *Entitlement* – FAA entitlement funds are "earned" by airports based on the number of enplaned passengers using a sliding scale. An airport's first 50,000 passengers per year earn $7.80 per passenger and the second 50,000 earn $5.20 per passenger. Additional passengers over certain levels earn $2.60 and $0.65 with passengers over 1,000,000 earning $0.50 each. The total earnings per airport are doubled if the AIP is funded over $3.35 billion per year, which has occurred in recent years. However, the minimum entitlement for FAA Primary airports (those that enplane at least 10,000 passengers per year) is $1,000,000. If Canyonlands Field were to attain at least 10,000 annual passengers, the airport would be eligible to receive this funding.

- *Discretionary* – Airport capacity, safety, and security projects are funded on a national priority system based on need. Many of the most expensive projects in the Capital Improvement Program (CIP) such as the airport reference code upgrades are expected to be funded from discretionary funds. Other CIP projects may be eligible for FAA discretionary dollars, but are less highly ranked or have portions of the project that may be funded from discretionary funds. Discretionary funds provide for 90.63 percent of the cost of eligible projects.

- *State Apportionment* – The FAA also sets aside a certain amount of money per year to be distributed amongst the airports within each state. The state apportionment for Utah in 2014 was approximately $4 million.

Grant eligible items typically include airfield and aeronautical related facilities such as runways, taxiways, aprons, lighting and visual aids, and equipment as well as land acquisition, planning and environmental tasks needed to accomplish the improvements. Public use (non-revenue generating) portions of passenger terminals are also grant eligible. In addition, fuel systems and hangars are also grant eligible; however, these items are considered a low priority for FAA funding.

8.2.2 State of Utah

The Utah Department of Transportation (UDOT) Aeronautics Division participates in funding airport development and maintenance projects in the State of Utah. UDOT normally contributes 80 to 90 percent on projects without Federal participation. UDOT normally contributes 4.685

percent on projects with Federal participation. Funds are obtained primarily through aviation fuel sales tax and aircraft registration fees.

8.2.3 Canyonlands Field

The Airport sponsor has several methods available for funding the capital required to meet the local share of airport development costs. The most common methods involve cash (including Passenger Facility Charge (PFC) revenues, debt financing (which amortize the debt over the useful life of the project), force accounts, in-kind service, third-party support and donations.

The Airport will fund all remaining capital project amounts from annual earning or reserves. The Airport principally collects revenues from rental cars, general aviation users, and tenants such as airline ticket sales and Fixed Base Operators (FBO). As necessary, rate increases or new charges can be implemented to obtain the necessary capital funds. Borrowing can also occur, but such funds are ultimately repaid with operating earnings. Increased air traffic should also generate more revenue.

Local funding and financing alternatives are listed below:

Bank Financing. Some airport sponsors use bank financing as a means of funding airport development. Generally, two conditions are required. First, the sponsor must show the ability to repay the loan plus interest and second, capital improvements must be less than the value of the present facility or some other collateral used to secure the loan. These are standard conditions which are applied to almost all bank loan transactions.

General Obligation Bonds. General Obligation bonds (GO) are a common form of municipal bonds whose payment is secured by the full faith credit and taxing authority of the issuing agency. GO bonds are instruments of credit and because of the community guarantee, reduce the available debt level of the sponsoring community. This type of bond uses tax revenues to retire debt and the key element becomes the approval of the voters to a tax levy to support airport development. If approved, GO bonds are typically issued at a lower interest rate than other types of bonds.

Self-liquidating General Obligation Bonds. As with General Obligation bonds, Self-liquidating General Obligation Bonds are secured by the issuing government agency. They are retired, however, by cash flow from the operation of the facility. Providing the state court determines that the project is self-sustaining, the debt may be legally excluded from the community's debt limit. Since the credit of the local government bears the ultimate risk of default, the bond issue is still considered, for the purpose of financial analysis, as part of the debt burden of the community. Therefore, this method of financing may mean a higher rate of interest on all bonds sold by the community. The amount of increase in the interest rate depends, in part, upon the degree of risk of the bond. Exposure risk occurs when there is insufficient net airport operating income to cover the level of service plus coverage requirements, thus forcing the community to absorb the residual.

Revenue Bonds. Revenue Bonds are payable solely from the revenues of a particular project or from operating income of the borrowing agency, such as an airport commission which lacks taxing power. Generally, they fall outside of constitutional and statutory limitations and in many cases do not require voter approval. Because of the limitations on the other public bonds, airport sponsors are increasingly turning to revenue bonds whenever possible. However, revenue bonds normally carry a higher rate of interest because they lack the guarantees of municipal bonds. It should also be noted that the general public would usually be wary of the risk involved with a revenue bond issue for a general aviation airport. Therefore, the sale of such bonds could be more difficult than other types of bonds.

Combined Revenue/General Obligation Bonds. These bonds, also known as "Double-Barrel Bonds", are secured by a pledge of back-up tax revenues to cover principal and interest payments in cases where airport revenues are insufficient. The combined Revenue/General Obligation Bond interest rates are usually lower than Revenue Bonds, due to their back-up tax provisions.

Force Accounts, In-kind Service, Donations. Depending on the capabilities of the Sponsor, the use of force accounts, in-kind service, or donations may be approved by the FAA for the Sponsor to provide their share of the eligible project costs. An example of force accounts would be the use of heavy machinery and operators for earthmoving and site preparation of runways or taxiways; the installation of fencing; or the construction of improvements to access roads. In-kind service may include surveying, engineering or other services. Donations may include land or materials such as gravel or water needed for the project. The values of these items must be verified and approved by the FAA prior to initiation of the project.

Third-Party Support. Several types of funding fall into this category. For example, individuals or interested organizations may contribute portions of the required development funds (Pilot Associations, Economic Development Associations, Chambers of Commerce, etc.). Although not a common means of airport financing, the role of private financial contributions not only increases the financial support of the project, but also stimulates moral support to airport development from local communities. Because of the potential for hangar development, private developers may be persuaded to invest in hangar development. A suggestion would be that the Airport authorizes long-term leases to individuals interested in constructing a hangar on airport property. This arrangement generates revenue from the airport, stimulates airport activity, and minimizes the sponsor’s capital investment requirements. Another method of third-party support involves permitting the FBO to construct and monitor facilities on property leased from the airport. Terms of the lease generally include a fixed amount plus a percentage of revenues and a fuel flowage fee. The advantage to this arrangement is that it lowers the sponsor’s development costs, a large portion of which is building construction and maintenance.

The Airport funds some or all of the cost of capital projects by generating revenue from tenants, users and other sources. These airport funds can come from annual surplus, reserves, or borrowing. While capital projects are usually funded from a variety of sources, in the end, Airport contributed funds have a role in almost all projects, particularly as seed money to initiate projects and to provide the match of FAA or State funds.

Other methods outside the traditional methods mentioned in the above paragraph are potential suppliers of money to construct capital improvements. These include users, tenants, investors, and other sources. Tenants often construct their own facilities particularly hangar facilities. Airport users such as corporate flight departments sometimes contribute funds for projects and agree to increased rents to recover the costs of improvements. Private capital can also be used for facilities such as general aviation and corporate hangar facilities.

8.3 Airport Development Plan

Future airport development at Canyonlands Field as included in this Airport Master Plan covers a 20-year planning period. Development items are grouped into three phases:

- Phase I: Initial-term (1-5 years)
- Phase II: Intermediate-term (6-10 years)
- Phase III: Long-term (11-20 years)

Estimated development costs are based on the proposed improvements (as shown on the Airport Layout Plan) and are included for each item in the financial development plan. Proposed improvements are based on the recommended facility requirements discussed in Chapter Four, *Facility Requirements*. The phasing of projects assists the airport sponsor in budgetary planning for future construction projects. The Capital Improvement Plan is depicted graphically at the end of this chapter. **Table 8-1** and **Table 8-2** outline the 20-year financial development plan.

Phase I (1-5 Years) Initial-Term Development Items

- A1: Upgrade Medium Intensity Taxiway Lights (MITLs)
- A2: C-II Airport Reference Code (ARC) Upgrade – Environmental Assessment (EA)
- A3: C-II ARC Upgrade
- A4: Culvert Improvements
- A5: Taxiway A Seal Coat
- A6: Expand Aircraft Parking Apron
- A7: Airfield Seal Coat
- A8: Passenger Terminal Building Expansion
- A9: Utility Improvements

Phase II (6-10 Years) Intermediate-Term Development Items

- B1: Runway 3-21 Shift – EA
- B2: Runway 3-21 Shift
- B3: Improve Airport Access Road and Parking
- B4: Construct Helicopter Parking Pads
- B5: Install 12,000 Gallon Jet-A Storage Tank
- B6: Install Perimeter Fence/Cattle Guard
- B7: Passenger Terminal Building Analysis
- B8: Airport Layout Plan (ALP) Update
- B9: Airfield Seal Coat

Phase III (11-20 Years) Long-Term Development Items

- C1: C-III ARC Upgrade – EA
- C2: C-III ARC Upgrade
- C3: Expand Apron and Extend Taxilanes
- C4: Airport Master Plan
- C5: Airfield Seal Coat

Table 8-1 20 Year Financial Development Plan (with EDC Designation)

Phase	Development Items	Total 100%	FAA 95%	UDOT 2.5%	Local 2.5%
A1	Upgrade MITLs	$637,000	$605,150	$15,925	$15,925
A2	C-II ARC Upgrade – EA	$500,000	$475,000	$12,500	$12,500
A3	C-II ARC Upgrade	$9,300,000	$8,835,000	$232,500	$232,500
A4	Culvert Improvements	$1,700,000	$1,615,000	$42,500	$42,500
A5	Taxiway A Seal Coat	$157,895	$150,000	$3,947	$3,947
A6	Expand Aircraft Parking Apron	$842,105	$800,000	$21,053	$21,053
A7	Airfield Seal Coat	$157,895	$150,000	$3,947	$3,947
A8	Passenger Terminal Building Expansion	$600,000	$570,000	$15,000	$15,000
A9	Utility Improvements*	$80,000	$0	$72,000	$8,000
	Phase I Total	**$16,837,000**	**$13,974,894**	**$13,200,150**	**$419,373**
B1	Runway 3-21 Shift – EA	$300,000	$285,000	$7,500	$7,500
B2	Runway 3-21 Shift	$1,500,000	$1,425,000	$37,500	$37,500
B3	Improve Airport Access Road and Parking	$1,750,000	$1,662,500	$43,750	$43,750
B4	Construct Helicopter Parking Pads	$375,000	$356,250	$9,375	$9,375
B5	Install 12,000 Gallon Jet-A Storage Tank	$400,000	$380,000	$10,000	$10,000
B6	Install Perimeter Fence/Cattle Guard	$575,000	$546,250	$14,375	$14,375
B7	Passenger Terminal Building Analysis	$157,895	$150,000	$3,947	$3,947
B8	ALP Update	$125,000	$118,750	$3,125	$3,125
B9	Airfield Seal Coat	$157,895	$150,000	$3,947	$3,947
	Phase II Total	**$5,340,789**	**$5,073,750**	**$133,520**	**$133,520**
C1	C-III ARC Upgrade – EA	$631,579	$600,000	$15,789	$15,789
C2	C-III ARC Upgrade	$16,631,579	$15,800,000	$415,789	$415,789
C3	Expand Apron and Extend Taxilanes	$3,500,000	$3,325,000	$87,500	$87,500
C4	Airport Master Plan	$500,000	$475,000	$12,500	$12,500
C5	Airfield Seal Coat	$157,895	$150,000	$3,947	$3,947
	Phase III Total	**$21,421,053**	**$20,350,000**	**$535,525**	**$535,525**
	Total Development Cost	**$40,736,737**	**$38,623,900**	**$1,088,418**	**$1,024,418**

All cost estimates are in 2015 dollars and are for planning purposes only.

*Not eligible for FAA funding. Assumes project funded at 90 percent by UDOT with a 10 percent local match.

Table 8-2 20 Year Financial Development Plan (without EDC Designation)

Phase	Development Items	Total 100%	FAA 90.63%	UDOT 4.685%	Local 4.685%
A1	Upgrade MITLs	$637,000	$605,150	$15,925	$15,925
A2	C-II ARC Upgrade – EA	$500,000	$475,000	$12,500	$12,500
A3	C-II ARC Upgrade	$9,300,000	$8,835,000	$232,500	$232,500
A4	Culvert Improvements	$1,700,000	$1,615,000	$42,500	$42,500
A5	Repave Taxiway A	$165,508	$150,000	$7,754	$7,754
A6	Expand Aircraft Parking Apron	$842,105	$800,000	$21,053	$21,053
A7	Pavement Preservation	$165,508	$150,000	$7,754	$7,754
A8	Passenger Terminal Building Expansion	$600,000	$570,000	$15,000	$15,000
A9	Utility Improvements*	$80,000	$0	$72,000	$8,000
	Phase I Total	**$16,887,000**	**$13,990,121**	**$13,200,150**	**$426,986**
B1	Runway 3-21 Shift – EA	$300,000	$285,000	$7,500	$7,500
B2	Runway 3-21 Shift	$1,500,000	$1,425,000	$37,500	$37,500
B3	Improve Airport Access Road and Parking	$1,750,000	$1,662,500	$43,750	$43,750
B4	Construct Helicopter Parking Pads	$375,000	$356,250	$9,375	$9,375
B5	Install 12,000 Gallon Jet-A Storage Tank	$400,000	$380,000	$10,000	$10,000
B6	Install Perimeter Fence/Cattle Guard	$575,000	$546,250	$14,375	$14,375
B7	Passenger Terminal Building Analysis	$165,508	$150,000	$7,754	$7,754
B8	ALP Update	$125,000	$118,750	$3,125	$3,125
B9	Pavement Maintenance	$165,508	$150,000	$7,754	$7,754
	Phase II Total	**$5,356,016**	**$5,073,750**	**$141,133**	**$141,133**
C1	C-III ARC Upgrade – EA	$631,579	$600,000	$15,789	$15,789
C2	C-III ARC Upgrade	$16,631,579	$15,800,000	$415,789	$415,789
C3	Expand Apron and Extend Taxilanes	$3,500,000	$3,172,050	$87,500	$87,500
C4	Airport Master Plan	$500,000	$475,000	$12,500	$12,500
C5	Pavement Maintenance	$165,508	$150,000	$7,754	$7,754
	Phase III Total	**$21,428,666**	**$20,197,050**	**$539,332**	**$539,332**
	Total Development Cost	**$40,774,804**	**$38,470,950**	**$1,107,451**	**$1,043,451**

All cost estimates are in 2015 dollars and are for planning purposes only.
*Not eligible for FAA funding. Assumes project funded at 90 percent by UDOT with a 10 percent local match.

8.4 Financial Plan

The principal objective in this financial plan is to assess the feasibility of the proposed capital improvements at Canyonlands Field. This analysis covers a 20-year planning period including the initial, intermediate, and long-term and indicates the ability of the Airport to undertake the improvements proposed in the Airport Master Plan Capital Improvement Program (CIP). The analysis considers several elements including the following:

- The Airport's historical financial structure including revenue sources, expense categories, debt service obligations, and recent trends in operating expenses and revenues.

- The phased plan of scheduled/proposed capital projects covering the Airport Master Plan period presented in the previous chapter. The phasing plan also includes a proposed funding plan for the initial term.

- An analysis of Passenger Facility Charge (PFC) revenue and its use in funding future Airport improvements.

An airport's financial structure can vary, perhaps significantly, from year to year as changes occur in air traffic, number of tenants, rates charged, construction costs, level of operating expenses, and other factors. Financial projections for the intermediate and long-term planning phases, in particular, should be viewed as tentative and updated frequently in the future. The capital project financial plan presented in this Chapter, while representative of today's best estimate, is subject to a wide variety of influences and may prove to need adjustment in the future for several reasons including, but not limited to, the following:

- The priorities in identified capital improvements may change. For example, market conditions may cause changes in maintenance of existing facilities, require new facilities, or redefine priorities.

- Safety and security improvements, whether they are reflected in the CIP or not, may require immediate funding and force postponement of other projects.

- Cost estimates to provide improvements can fluctuate particularly when considering factor such as technological advancements, economies of scale related to undertaking several improvements at once, and the cost of raw materials such as concrete, steel, and other building materials.

- Emergency repairs or changes required by new regulations may require funds that had been programmed for other projects are reallocated.

It is recommended that the financial plan, including the CIP, be utilized as a working tool, which should be updated as necessary. Capital improvements, their associated costs, and financial projections should be re-examined periodically throughout the planning period even though the figures contained herein present a reasonable forecast of needed initiatives to implement the Airport Master Plan recommendations.

8.4.1 Projected Revenue and Expenditure

Airport operating expenditures typically include insurance, utilities, and maintenance and management costs. Insurance costs include liability insurance for the Airport and property insurance for any real property on the Airport. Utility expenses primarily consist of electrical power to operate airfield lighting and visual aids and water for public use areas. Pavement maintenance consists of crack sealing on an annual basis and seal coating and remarking the pavements every five years. Facility maintenance consists of mowing, snow removal and repair and replacement of parts and equipment such as light bulbs, light fixtures, fences, etc. Management costs include an airport manager and staff members, maintenance and emergency response. Currently at Canyonlands Field, there is a full-time airport manager and an operations supervisor.

Airport revenues at Canyonlands Field consist of land leases, user fees, fuel flowage fees, landing fees, PFCs, tenant lease space, fines and forfeitures, and property taxes generated

from on-airport improvements. Descriptions of airport revenue generating opportunities are found below:

Land and Ground Leases. Property on the airport that is not devoted to airfield use, vehicle parking or contained within areas required to be cleared of structures may be leased to individual airport users or aviation related businesses. Typically, the individual is provided a long-term lease on which to construct a hangar, business or other facility. At the termination of the lease, the lessee has the option to renew the lease, sell or lease the buildings or to remove the buildings. Canyonlands Field currently collects revenue through the form of land leases. The main component of the land lease is comprised of aircraft storage around the airfield.

Hangar Leases. Hangars on the airport owned by the airport sponsor can be leased to private aircraft operators or businesses. Typically, as with land leases, the individual or business is provided a long-term lease of the hangar. At the termination of the lease, the lessee has the option to renew the lease or cease use of the hangar. Canyonlands Field currently collects revenue through the form of hangar leases.

Hangar Rental. The FBO Hangar is available for monthly or nightly rental. The fees are usually established on a monthly basis for based aircraft and on an overnight basis for transient aircraft. Canyonlands Field currently collects revenue through the form of hangar rentals.

Fines and Forfeitures. The Airport has the ability to collect revenue through fines and penalties imposed to users through the form of flowage fees, parking fees, user fees and property damage claims.

Passenger Facility Charges (PFC). The Aviation Safety and Capacity Expansion Act of 1990 authorized the Secretary of Transportation to grant public agencies the authority to impose a Passenger Facility Charge (PFC) to fund eligible airport projects. The initial legislation set the maximum PFC level at $3.00 per enplaned passenger. AIR-21 increased the maximum PFC level form $3.00 to $4.50. In 2012, the FAA Modernization and Report Act retained the PFC cap at $4.50. Although the FAA is required to approve PFCs, the program allows for local collection of PFC revenue through the airlines operating at an airport and provides more spending flexibility to airport sponsors versus AIP funds. The potential PFC revenues are listed in **Table 8-3**. The Airport currently imposes a PFC at the $4.50 level and this charge is expected to continue. At current passenger levels, in 2014, approximately $40,320 was collected from PFCs.

Table 8-3 Potential PFC Revenues (Existing PFC Cap)

	Calendar Year	Annual Enplanements	Potential Annual PFCs ($4.50)
Historical	2014	9,237	$40,320
Projected	2019	11,288	$49,272
	2024	13,835	$60,390
	2029	17,035	$74,358
	2034	21,072	$91,979

Prepared by: Armstrong Consultants, Inc., May 2015
Note: PFC Calculation assumes that 97 percent of enplanements are revenue passengers.

In April 2015, discussion was brought to Congress to increase the PFC cap from $4.50 to $8.50 per passenger. The existing PFC cap has remained the same since 2000. If the PFC were to be increased, it would provide Canyonlands Field with the opportunity to obtain more funding for airport improvement projects. **Table 8-4** lists the potential revenues Canyonlands Field could obtain if Congress increased the PFC cap to $8.50.

Table 8-4 Potential PFC Revenues (Increased PFC Cap)

	Calendar Year	Annual Enplanements	Potential Annual PFCs ($8.50)
Historical	2014	9,237	$76,159
Projected	2019	11,288	$93,070
	2024	13,835	$114,070
	2029	17,035	$140,454
	2034	21,072	$173,739

Prepared by: Armstrong Consultants, Inc., May 2015
Note: PFC Calculation assumes that 97 percent of enplanements are revenue passengers.

Tie-Down Fees. A fee is typically established for the use of fixed ramp tiedowns on paved apron areas. The fees are usually established on a monthly or annual basis for based aircraft and on an overnight basis for transient aircraft. Canyonlands Field currently charges a tiedown fee of $5 per night and $30 per month.

Through-the-Fence Fees. A fee is typically charged to adjacent landowners who are provided access directly from their private parcel to the public use airport facilities. This fee ensures that the level of rates and charges assessed to on-airport users is equitable to off-airport users and that there is not an unfair economic advantage to operating through-the-fence. Additionally, through-the-fence operators are required to maintain a secure airport perimeter with fencing and/or gates and to construct paved access taxiways to the airport operating areas. However, the FAA generally discourages through-the-fence operations. Therefore, it is anticipated that all aircraft operations will be conducted from on airport and therefore will not generate through-the-fence fees. In lieu of through-the-fence fees, these aircraft would generate tie-down fees or land lease revenue from hangars. Canyonlands Field does not currently collect any through-the-fence fees.

Fuel Flowage Fee. This fee is typically imposed on all aircraft fuels delivered to the airport and would include all fuels used by aircraft including AvGas and Jet-A. The fee would apply to fixed base operators, self-fueling and through-the-fence operators who conduct self-fueling. Canyonlands Field currently collects a fuel flowage fee.

Airport Usage, Landing and Ramp Fee. This fee is typically imposed on commercial and charter aircraft and can be waived if the operator purchases a minimum of 50 gallons of fuel. The airport usage fee is usually charged by the FBO. Canyonlands Field currently collects fees associated with airport, landing and ramp usage.

All revenues generated by the Airport must be expended by the Airport for the capital or operating costs of the Airport.

Table 8-5 shows the historical revenues and expenses for Canyonlands Field. **Table 8-6** shows the projected revenues and expenses for Canyonlands Field. The projections are based on historical data provided by the Airport Manager.

Table 8-6 also shows how the implementation of the Airport Layout Plan capital improvement projects would increase revenues at the Airport. The assumption is made that if infrastructure is put in place at the Airport that additional revenues would result from the increased number of based aircraft, additional hangars, increased aircraft operations and corporate influx. The Airport has additional methods of generating revenue which were not included in the calculation below such as charging for parking. The excess revenues can be used toward the local match for federal or state capital improvement projects, self-funded airport improvements, airport marketing and promotion or other airport generating and maintenance costs.

Table 8-5 Historical Airport Revenue and Expenditures

Airport Revenue	**2010**	**2011**	**2012**	**2013**	**2014**
Airline Aeronautical Revenue	$14,501	$14,777	$14,940	$14,159	$24,427
Non-Airline Aeronautical Revenue	$59,992	$60,670	$74,199	$79,317	$94,446
Non-Aeronautical Revenue	$15,025	$15,677	$26,912	$31,387	$55,025
Transient Room Tax Revenue	$0	$0	$0	$0	$25,000
Total Airport Revenue	**$89,518**	**$91,124**	**$116,051**	**$124,863**	**$198,897**
Airport Expenditures					
Operating Expenses	$178,467	$181,484	$211,156	$230,463	$242,795
Debt Service	$0	$0	$0	$0	$25,000
Total Airport Expenditures	**$178,467**	**$181,484**	**$211,156**	**$230,463**	**$267,795**
Net Airport Income	**($88,949)**	**($90,360)**	**($95,105)**	**($105,600)**	**($68,898)**

Prepared by: Armstrong Consultants, Inc., 2015
1/ Does not include Capital Improvement Revenue
2/ Does not include PFC Revenue
3/ 2014 passenger airline aeronautical revenue includes the remodel of the passenger terminal building paid for by SkyWest Airlines in lieu of rent.

Table 8-6 Projected Airport Revenue and Expenditures

Airport Revenue	**2019**	**2024**	**2029**	**2034**
Airline Aeronautical Revenue	$30,838	$41,268	$55,226	$73,905
Non-Airline Aeronautical Revenue	$100,241	$113,427	$125,233	$138,267
Non-Aeronautical Revenue	$69,467	$92,963	$124,405	$166,482
Total Airport Revenue	**$200,547**	**$247,659**	**$304,865**	**$378,655**
Airport Expenditures				
Operating Expenses	$262,850	$284,562	$308,067	$333,514
Total Airport Expenditures	**$262,850**	**$284,562**	**$308,067**	**$333,514**
Net Airport Income	**($59,810)**	**($36,903)**	**($3,202)**	**$45,141**

Prepared by: Armstrong Consultants, Inc., 2015
1/ Projections based on the average of each time period with a six percent annual growth for airline and non-aeronautical revenue and two percent growth for non-passenger aeronautical revenue (in 2015 dollars)
2/ Does not include Capital Improvement Revenue
3/ Does not include PFC Revenue
4/ Operating expense needs are unknown and expected to remain the same.
5/ Total airport expenditures increase at the 2014 consumer price inflation rate of 1.6 percent

8.5 Recommendations

Canyonlands Field has a limited amount of revenue collection. The most effective means of increasing revenue at the Airport is to accommodate existing unmet demand and to continue to attract new and additional users. Several potential strategies for increasing revenues are listed below:

- Increase rates for ground leases and increase the number of ground leases for aircraft storage hangars
- Increase hangar storage rates
- Increase tiedown fees
- Charge passengers and visitors for short-, and long-term parking
- Increase fuel flowage fee
- Focus on attracting business/corporate aviation tenants
- Increase the industrial and business development park

Increasing aircraft storage hangars at the airport would result in not only increased direct revenues generated through property leases, but would also produce indirect revenue through increased use of airport services and facilities, such as fuel purchases. Several aircraft owners have indicated an interest in leasing land from the airport to construct hangars. Locations for additional hangars have been identified on the Terminal Area Drawing (TAD) of the Airport Layout Plan. Business/corporate tenants are typically flight departments for local businesses and provide employment in the local community. They generally operate multi-engine turboprop or business jet aircraft. Their land lease parcels are usually large, the aircraft are typically operated two to three times per week and fuel purchases are typically larger than other general aviation user (several hundred gallons per fueling).

Whether the improved Canyonlands Field operates at an annual surplus or subsidy depends greatly on the amount of activity and facilities that are constructed at the Airport. Existing demand is currently constrained by inadequate hangar space. With increased operations at the airport due to the availability of hangar space, the airport would then need to accommodate increased numbers of based and transient aircraft with hangars. This can be accommodated through the construction of taxilanes and providing land leases for hangars.

8.5.1 Community Support

While it would certainly be advantageous for an airport to support itself, the indirect and intangible benefits of the airport to the community's economy and growth must be considered. Members of the community are directly or indirectly employed on the airport and by individual

businesses. As airport activity increases, it is probable that employment on the airport will also grow throughout the planning period. The local construction industry will also benefit directly from implementation of the development programs. Other community benefits involve business growth and development that is enhanced by the availability of air transportation including commercial service, corporate and private aviation. Clients and suppliers of area businesses will also benefit from the future improvement to the airport.

The use of corporate and business aircraft is an increasing trend throughout the United States. The movement of American industry from large metropolitan areas to smaller communities which offer lower taxes and labor costs and a better working environment has influenced this trend. Time is money in the business environment and corporate aircraft are answering the need for quick and convenient access to and from these new locations for both executives and management personnel. The ability of a community to provide convenient access to corporate aircraft will be reflected not only in benefits to existing businesses and industries but will be a strong factor in attracting new industry. These factors place Canyonlands Field in a prime position to capitalize on the trends in the commercial and general aviation industry and to maximize the benefits the airport provides to the community.

8.6 Continuous Planning Process

Airport planning is a continuous process that does not end with the completion of a major capital project. The fundamental issues upon which these airport master plans are based are expected to remain valid for several years; however, several variables, such as based aircraft, annual aircraft operations, and socioeconomic conditions are likely to change over time. The continuous planning process necessitates that Grand County consistently monitor the progress of the Airport in terms of growth in based aircraft and annual operations, as this growth is critical to the exact timing and need for new airport facilities as recommended within the Airport Master Plan. The information obtained from this monitoring process will provide the data necessary to determine if the development schedule should be accelerated, decelerated or maintained as scheduled.

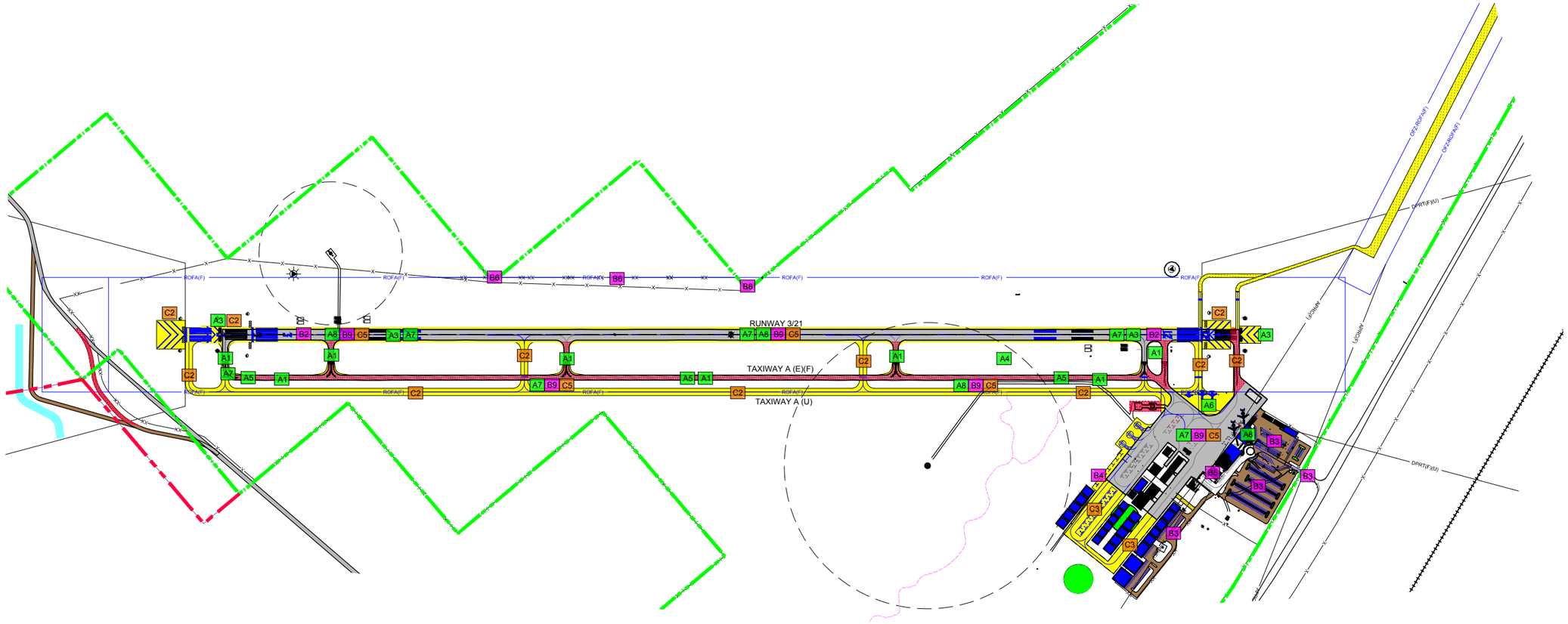
Periodic updates of the Airport Layout Plan, Capital Improvement Plan, and Airport Master Plan are recommended to document physical changes to the Airport, review changes in aviation activity and to update improvement plans for the Airport. The primary goal of the Airport Master Planning effort is to develop a safe and efficient airport that will meet the demands of its aviation users and stimulate economic development for Grand County. The continuous airport planning process is a valuable tool in achieving the strategic plans and goals for the Airport.

8.7 Summary

This Chapter indicates that funding would be available to plan, design and construct the projects identified in the Airport Master Plan. A total of 22 CIP projects have been identified of which all are programmed within the next 20-year planning period.

This financial analysis is based on the continuation of FAA and State funding at the current levels. However, there is competition for FAA and State funds, so the Airport will need to aggressively communicate its CIP needs to the FAA, State, and other relevant agencies as opportunities arise.

Based on the assumptions, the financial analysis presented herein, the CIP is considered practicable and it is anticipated that Canyonlands Field will be able to construct the necessary aviation facilities as recommended herein. Of course, the continued monitoring of the Airport's financial status is necessary to adapt and adjust to condition change.



AIRFIELD LAYOUT

400 0 400 800

SCALE IN FEET

PHASE I - (1-5 YEARS) SHORT-TERM DEVELOPMENT ITEMS

- A1 UPGRADE MEDIUM INTENSITY TAXIWAY LIGHTS (MITLs)
- A2 C-II ARC UPGRADE - EA (NOT SHOWN ON DRAWING)
- A3 C-II UPGRADE
- A4 CULVERT IMPROVEMENTS
- A5 TAXIWAY A SEAL COAT
- A6 EXPAND AIRCRAFT PARKING
- A7 SEAL COAT
- A8 PASSENGER TERMINAL BUILDING EXPANSION
- A9 AIRFIELD UTILITY IMPROVEMENTS (NOT SHOWN ON DRAWING)

PHASE II - (6-10 YEARS) MEDIUM-TERM DEVELOPMENT ITEM

- B1 RUNWAY 3/21 SHIFT - EA (NOT SHOWN ON DRAWING)
- B2 RUNWAY 3/21 SHIFT
- B3 IMPROVE AIRPORT ACCESS ROAD AND PARKING
- B4 CONSTRUCT HELICOPTER PARKING PADS
- B5 INSTALL 12,000 GALLON JET - A STORAGE TANK
- B6 INSTALL PERIMETER FENCE / CATTLE GUARD
- B7 PASSENGER TERMINAL BUILDING ANALYSIS (NOT SHOWN ON DRAWING)
- B8 ALP UPDATE (NOT SHOWN ON DRAWING)
- B9 SEAL COAT

PHASE III - (11-20 YEARS) LONG-TERM DEVELOPMENT ITEM

- C1 C-III ARC UPGRADE - EA (NOT SHOWN ON DRAWING)
- C2 C-III ARC UPGRADE
- C3 EXPAND APRON AND EXTEND TAXILANES
- C4 AIRPORT MASTER PLAN (NOT SHOWN ON DRAWING)
- C5 SEAL COAT

LEGEND

- EXISTING AIRPORT BOUNDARY LINE
- FUTURE AIRPORT BOUNDARY LINE
- EXISTING FENCE
- FUTURE FENCE
- EXISTING STRUCTURE
- FUTURE STRUCTURE
- FUTURE AIRFIELD PAVEMENTS
- EXISTING AIRFIELD PAVEMENTS
- DRAINAGE
- EXISTING ROAD
- FUTURE ROAD
- TO BE REMOVED

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101
ARIZONA: 602.803.7079
NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146251	09/2015	CIP EXHIBIT	6251621	GWK	JMR	JZP

THE INFORMATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS, OPINIONS, CONCLUSIONS, AND RECOMMENDATIONS OF THIS DOCUMENT ARE ARMSTRONG CONSULTANTS, INC.'S (ACI) ASSESSMENT AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE FEDERAL AVIATION ADMINISTRATION (FAA). THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED IN THIS DOCUMENT. THE FAA DOES NOT INTEND THAT THIS DOCUMENT BE ACCEPTED AS ENVIRONMENTALLY ACCEPTABLE OR WOULD IMPLY JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

PHASED DEVELOPMENT PLAN

Sheet: 1 of: 1

APPENDIX A

FAA FORECAST COMPARISON AND APPROVAL

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

U.S. Department
of Transportation
**Federal Aviation
Administration**

Denver Airports District Office
26805 E. 68th Avenue, Room 224
Denver, Colorado 80249
303-342-1250; FAX303-342-1260

July 14, 2015

Judd Hill
Canyonlands Field
125 East Center
Moab, UT 84532

Canyonlands Field
Moab, UT
Revised Forecast Approval

Dear Mr. Hill,

The Federal Aviation Administration has completed review of forecast information for Canyonlands Field received July 9, 2015. We found the forecast to be supported by reasonable planning assumptions and current data and developed using acceptable forecasting methodologies. Accordingly this forecast is approved for the use in the Canyonlands Field Master Plan.

If you have any questions concerning this matter, please contact me at (303) 342-1263 or john.sweeney@faa.gov

Sincerely,

John Sweeney
Airport Planner

ecc: UDOT
John Rostas-Armstrong

Template for Comparing Airport Planning and TAF Forecasts

AIRPORT NAME: CANYONLANDS FIELD, MOAB, UTAH

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Itinerant Operations				
Base yr.	2014	7,900	8,050	-1.9%
Base yr. + 5yrs.	2019	8,407	8,050	4.4%
Base yr. + 10yrs.	2024	8,660	8,050	7.6%
Base yr. + 15yrs.	2029	9,168	8,050	13.9%
Base yr. + 20yrs.	2034	9,674	8,050	20.2%
Local Operations				
Base yr.	2014	2,000	2,100	-4.8%
Base yr. + 5yrs.	2019	2,132	2,100	1.5%
Base yr. + 10yrs.	2024	2,198	2,100	4.7%
Base yr. + 15yrs.	2029	2,329	2,100	10.9%
Base yr. + 20yrs.	2034	2,461	2,100	17.2%
Total Operations				
Base yr.	2014	9,900	10,150	-2.5%
Base yr. + 5yrs.	2019	10,539	10,150	3.8%
Base yr. + 10yrs.	2024	10,858	10,150	7.0%
Base yr. + 15yrs.	2029	11,497	10,150	13.3%
Base yr. + 20yrs.	2034	12,135	10,150	19.6%

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Total Enplanements				
Base yr.	2014	9,100	4,187	117.3%
Base yr. + 5yrs.	2019	11,121	4,187	165.6%
Base yr. + 10yrs.	2024	13,630	4,187	225.5%
Base yr. + 15yrs.	2029	16,782	4,187	300.8%
Base yr. + 20yrs.	2034	20,759	4,187	395.8%
Total Based Aircraft				
Base yr.	2014	31	13	138.5%
Base yr. + 5yrs.	2019	33	13	153.8%
Base yr. + 10yrs.	2024	34	13	161.5%
Base yr. + 15yrs.	2029	36	13	176.9%
Base yr. + 20yrs.	2034	38	13	192.3%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).
AF/TAF (% Difference) column has embedded formulas.

APPENDIX B

SKYWEST AIRLINES LETTER OF SUPPORT

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

Feb. 27, 2015

Judd Hill
94 W. Aviation Way
Moab, UT 84532

Subject: SkyWest Airlines' Letter of Support
Runway width & strength enhancements
Canyonlands Field Airport

Dear Mr. Hill:

SkyWest Airlines would like to extend our strong support for the City of Moab/County's proposal outlining runway width and strength enhancements to accommodate jet aircraft.

SkyWest Airlines has served Moab periodically throughout the airlines' history, and recently returned with the 30-seat EMB 120 turboprop in 2014. However, as the airline transitions to an all-jet fleet, the airline will no longer have an aircraft capable of serving Canyonlands Field after May 2015 until a runway upgrade to ARC C-II is completed.

The necessary runway widening and strengthening improvements would create substantial enhancement of air service opportunities, including the opportunity for SkyWest Airlines to provide reliable commercial jet service to CNY, if fleet availability, network needs and partner relationships allow.

We would welcome the opportunity to work with City and Airport officials to ensure Moab travelers are able to access SkyWest's reliable air service in the future. Please contact me if you have questions concerning this letter of support and/or specifics about SkyWest Airlines.

Sincerely,

Greg Atkin
Managing Director, Market Development

APPENDIX C

FAA RPZ ANALYSIS MEMO

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

From: Nutting, Christina (FAA)
Sent: Wednesday, April 29, 2015 6:11 AM
To: Zulauf, Ryan (FAA)
Cc: Debban, Steven (FAA); Rinsler, Danielle (FAA)
Subject: RE: Moab RPZ

Good morning Ryan,

Thank you for submitting the RPZ alternatives analysis for Runway 03/21 at Canyonlands Field (CNY), in Moab, Utah. APP-400 and AAS-100 have reviewed the documentation provided in your email on April 15th. We understand that the triggering events for this RPZ analysis is the upgrade of Runway 03/21 from the existing B-II design standards to C-II design standards to accommodate the CRJ-200 to allow SkyWest Airlines to continue service to CNY.

Alternatives were created to address short-term (Phase I) and intermediate to long-term (Phase II) solutions. The Phase I preferred alternative, Alternative 1A, would widen Runway 03/21 from 75 feet to 100 feet and displace the Runway 03 threshold by 539 feet and the Runway 21 threshold by 252 feet. This alternative would not require the realignment of either road and would achieve a full RSA, ROFA, and ROFZ beyond the runway ends. The Phase II preferred alternative, Alternative 2A, removes the displaced thresholds by shifting Runway 03/21 by 252 feet to the southwest and realigns Blue Hills Road. This alternative also maintains full length RSAs, ROFAs, and ROFZs on both runway ends. These alternatives do not remove Blue Hills Road or Highway 191 from the RPZs, however Blue Hills Road is a dirt road with limited daily use (approximately 20 vehicles a day) and realigning Highway 191 would be cost prohibitive. We concur with the Region and ADO's support of the preferred alternatives for both Phase I and Phase II. The sponsor should continue to work at a local level to address any potential long-term development and consider acquiring property in the RPZs when practical to reduce potential development of incompatible land uses. Unconditional approval of these projects on the ALP is subject to completion of the environmental review in accordance with NEPA.

Regards,

Christina E. Nutting
Airport Planning Specialist
Office of Airports, APP-400
Federal Aviation Administration
Office: (202)267-9277

Federal Aviation Administration

Memorandum

Date:	April 3, 2015
To:	Danielle Rinsler, Assistant Manager, Airport Planning & Environmental Programs Division, APP-401 John R. Dermody, Manager, Airport Engineering Division, AAS-100
Thru:	Stan Allison, Manager, Planning, Environmental and Financial Programs Branch, ANM-610
From:	John Sweeney, Community Planner, Denver Airports District Office
Subject:	ACTION: Request for Review of and Concurrence with Canyonlands Field, Moab, UT, Future Runway Protection Zone (RPZ)

Purpose / Background

This Memo outlines the proposed improvements relating to an Airport Reference Code (ARC) upgrade at Canyonlands Field, Moab, Utah (CNY). The existing ARC at Canyonlands Field is B-II. Canyonlands Field is served by Runway 3-21, a 7,100 foot long by 75 feet wide asphalt runway. The airport has one non-precision instrument approach to Runway 3 and a VOR circling approach. The airport is located approximately 18 miles north of the City of Moab. Other than on-airport facilities, such as hangars and the passenger terminal building, there is no other development within seven miles of the airport, including the vicinity of the Runway Protection Zones.

Due to changes in the operating dynamics within the United States regional air carrier industry, several commercial service aircraft with passenger capacities less than 50 seats are slated for immediate retirement. Canyonlands Field is currently served by SkyWest Airlines (d/b/a Delta Connection) with the 30-passenger seat Embraer 120 (EMB-120) to Salt Lake City, Utah. This route is subsidized by the Department of Transportation's Essential Air Service (EAS) program. In November 2014, SkyWest Airlines announced the EMB-120 would be retired from service effective April 30, 2015. The airline has announced their desire to continue serving Canyonlands Field with the Bombardier Canadair Regional Jet (CRJ-200), a C-II aircraft. However, the existing design standards for Runway 3-21 are unable to accommodate this aircraft. In order to accommodate the CRJ-200, Canyonlands Field must upgrade the existing B-II design standards to C-II design standards which include the following:

- Runway Width: increased from 75 feet to 100 feet
- Runway Safety Area Width: increased from 150 feet to 500 feet
- Runway Safety Area Length Beyond Runway End: increased from 300 feet to 1,000 feet

- Runway Object Free Area Width: increased from 500 to 800 feet
- Runway Object Free Area Length Beyond Runway End: increased from 300 feet to 1,000 feet
- Runway Protection Zone: increased from 1,000’ x 500’ x 700’ to 1,700’ x 500’ x 1,010’

Without the ability to meet these design standards, Canyonlands Field is significantly constrained for future commercial air service. For Grand County, Utah and the City of Moab, this causes a substantial economic impact to their tourism-based economy.

The Runway Protection Zones (RPZ) for Runway 3-21 are currently bisected by roads on both runway ends. The Runway 3 departure/Runway 21 approach RPZ is bisected by Highway 191. The Runway 21 departure/Runway 3 approach RPZ is bisected by Blue Hills Road. According to the Federal Aviation Administration’s *Interim Guidance on Land Uses within a Runway Protection Zone*, a public road/highway within the RPZ requires further consultation if there is a change in critical aircraft which increases the RPZ dimensions.

Preferred Alternative

This memo provides details of several alternatives that have been evaluated per the FAA *Interim Guidance on Land Uses within a Runway Protection Zone* for addressing roads within the RPZs. Based on this evaluation, the most prudent and preferred alternative, Alternative 1A (short-term) and Alternative 2A (intermediate to long-term) is supported by the sponsor (Grand County), Utah Department of Transportation Division of Aeronautics, and the Federal Aviation Administration (FAA) Denver Airport District Office for the following reasons:

Phase I (Short-term): Widen Runway 3-21 and displace thresholds on Runway 3 by 539 feet and Runway 21 by 252 Feet (Alternative 1A)

- Would not require the realignment of either road
- Protects the Runway Safety Area, Runway Object Free Area and Runway Object Free Zone beyond the runway ends
- Minimal impacts to the Landing Distance Available
- Would accommodate the ARC upgrade
- Project could be completed in relatively short time period (approximately 18 months) preventing further economic impacts to the regional area
- Moves the thresholds on both ends of the runways further from the roadways than the existing conditions
- Reduced potential for environmental impacts in comparison to other alternatives
- Reduced development cost in comparison to other alternatives
- No appreciable change in percentage of RPZ occupied by the highway (less than two percent occupied space in existing and proposed configuration)

Phase II (Intermediate to long-term): Removing displaced thresholds by shifting Runway 3-21 by 252 feet to the southwest and realigning Blue Hills Road (Alternative 2A)

- Removes displaced thresholds for Runway 3-21
- Would remove Blue Hills Road from Runway 21 departure/Runway 3 approach RPZ
- Maintains clear full-length RSA/ROFAs on both ends of Runway 3-21
- Can be accomplished in the three to five year timeframe

This two-phased approach to the C-II ARC upgrade provides several benefits to Canyonlands Field and the surrounding region. The existing runway is unable to accommodate the design air carrier aircraft which is vital to this region. Furthermore, both Runway 3-21 RPZs are currently bisected by roads. Although the RPZ sizes will increase with a C-II ARC, the Runway 3 and 21 thresholds will be located 252 feet and 539 feet farther from the roads, respectively. Also, the roads are not of a significant volume which would result in the degradation of safety. Without a C-II runway, the long-term future of commercial air service at Canyonlands Field is in jeopardy. The proposed project will enhance the utility of the airport while meeting the FAA design standards set forth in Advisory Circular 150/5300-13A, Change 1, *Airport Design*. The table below lists critical information regarding the preferred alternative for Canyonlands Field.

Existing and Future RPZ Information

	Runway Protection Zone					
	Runway 3 Departure Runway 21 Approach			**Runway 21 Departure Runway 3 Approach**		
	Existing	**Phase I**	**Phase II**	**Existing**	**Phase I**	**Phase II**
Airport Reference Code	B-II	C-II	C-II	B-II	C-II	C-II
Critical Road	Highway 191			Blue Hills Road		
Air Traffic Utilization	20%			80%		
RPZ Size (in Acres)	13.77	29.465	29.465	13.77	29.465	29.465
Amount of Road in RPZ (in Acres)	0.22	0.58	0.56	0.44	0.66	0.50
Amount of Road in RPZ (%)	1.57%	1.98%	1.89%	3.22%	2.25%	1.71%
Distance from RW Threshold to Road	1,207’	1,459’	1,459’	982’	1,521’	1,000’
Average Annual Daily Traffic Total	6,000			20		

The preferred alternative is also supported by the FAA Denver Airport District Office and Utah Department of Transportation Division of Aeronautics. With the C-II ARC upgrade, several of the imaginary surfaces surrounding Runway 3-21 will increase in size and therefore must be accommodated to ensure safe operation at the airport, to the maximum extent practicable.

Runway Protection Zone (RPZ) Land Use Compatibility Analysis

The FAA encourages airport sponsors to control all land within the RPZs to achieve protection of people and property on the ground. The FAA recognizes in certain situations the Sponsor may not fully control the land within the RPZ; however the FAA expects the Sponsor to take reasonable measures to protect against and remove or mitigate incompatible land uses within the RPZ.

Summary of Project Goals-Project Purpose and Need

The purpose of upgrading the ARC to C-II is to accommodate the future C-II regional airline design aircraft. The need is related to design standards; Runway 3-21 does not currently meet C-II design standards. The goal of the project is to upgrade the design standards in the most cost effective and least environmentally impacting methods.

Analysis of Existing RPZs at Canyonlands Field

Runway 3 departure/Runway 21 approach RPZ: The existing RPZ dimensions are established in accordance with the design standards for a B-II runway with visibility minimums of not lower than one mile. The RPZ length is 1,000 feet, the inner width is 500 feet and the outer width is 700 feet. Based on the runway configuration, prevailing winds and published instrument approach procedures, the preferred arrival runway is Runway 3 and the preferred departure runway is Runway 21. Thus, this RPZ is utilized by approximately 20 percent of the arriving and departing air traffic at Canyonlands Field. The RPZ encompasses a portion of Highway 191 which is situated approximately 12 feet below the runway end elevation. Highway 191 is located at a distance of 1,192 feet from the runway threshold along the extended runway centerline. Highway 191 has a traffic volume of approximately 6,000 Average Annual Daily Traffic (AADT) and is a designated National Scenic Byway between Moab and Vernal (Dinosaur Diamond Prehistoric Highway). Highway 191 has a right-of-way width of 400 feet. Highway 191 is a two-lane highway with a speed limit of 65 miles per hour. Other than Highway 191 and a power line, there is no other existing commercial or residential development within or surrounding the RPZ.

Runway 21 departure/Runway 3 approach RPZ: The existing RPZ dimensions are established in accordance with the design standards for a B-II runway with visibility minimums of not lower than one mile. The RPZ length is 1,000 feet, the inner width is 500 feet and the outer width is 700 feet. This RPZ is utilized by approximately 80 percent of the arriving and departing air traffic and is therefore considered to be the more active RPZ at Canyonlands Field. The airfield typically experiences light winds which allows pilots to depart on Runway 21 and arrive on Runway 3 which provides a shorter taxi time to and from the aircraft parking apron. The RPZ encompasses a portion of Blue Hills Road which is situated approximately two feet below the runway end elevation. Blue Hills Road is a rural gravel county road with a very low traffic volume of approximately 20 AADT. The right-of-way width for Blue Hills Road is 80 feet with a speed limit of 35 miles per hour. Other than Blue Hills Road, there is no other existing commercial or residential development within or surrounding the RPZ.

Existing and Forecasted Use of RPZs at Canyonlands Field

The total number of existing and forecasted operations for each RPZ at Canyonlands Field has been listed below. Additionally, the number of existing and forecasted operations by Category C/D commercial aircraft for each RPZ has also been listed below. This assumes the Runway 21 departure/Runway 3 approach RPZ is utilized by 80 percent of air traffic at Canyonlands Field with the remaining 20 percent utilizing the Runway 3 departure/Runway 21 approach RPZ.

RPZ Use – Total Annual Operations

Year	Total Operations	Runway Protection Zone	
		Runway 3 Departure RW 21 Approach (20%)	Runway 21 Departure RW 3 Approach (80%)
2014	9,900	1,980	7,920
2019	10,539	2,108	8,431
2024	10,858	2,172	8,686
2029	11,497	2,299	9,198
2034	12,135	2,427	9,708

RPZ Use – Total Annual Operations by Approach Category C/D Commercial Aircraft

Year	C/D Approach Category Operations	Runway Protection Zone	
		Runway 3 Departure RW 21 Approach (20%)	Runway 21 Departure RW 3 Approach (80%)
2014	0	0	0
2019	746	149	597
2024	769	154	615
2029	815	163	652
2034	861	172	689

Alternative Descriptions and Analysis

Alternative 1 – Use of Displaced Thresholds: Alternative 1 includes widening the runway and the use of displaced thresholds to provide full RSAs and ROFAs beyond the runway ends meeting C-II standards. Each alternative includes increasing the ARC to C-II. Four variations of Alternative 1 were evaluated, are listed below and are depicted in the attached figures.

- Alternative 1A: Alternative 1A includes the displacement of the Runway 3 threshold by 539 feet and the displacement of the Runway 21 threshold by 252 feet. This alternative would upgrade Runway 3-21 to meet C-II design standards. This alternative would provide full RSA, ROFA and ROFZ lengths beyond the runway ends free of any penetrations and incompatible land uses. The major advantages for this alternative are the lower comparative costs, reduced potential for environmental impacts and greater comparative length of usable runway. The major disadvantage for this alternative includes the RPZs not being clear of Highway 191 and Blue Hills Road.

  Estimated Cost: $9,250,000

- Alternative 1B: Alternative 1B includes the displacement of the Runway 3 threshold by 539 feet and the displacement of the Runway 21 threshold by 1,212 feet. This alternative would upgrade Runway 3-21 to meet C-II design standards. This alternative would provide full RSA, ROFA and ROFZ lengths beyond the runway ends free of any penetrations and/or incompatible land uses. This alternative would also provide the Runway 3 departure/Runway 21 approach RPZ to be clear of Highway 191. The major advantage for this alternative is the removal of the busier road (Highway 191) from the

Runway 3 departure/Runway 21 approach RPZ. The major disadvantages to this alternative include a significant reduction of available runway length and Blue Hills Road remaining within the Runway 21 departure/Runway 3 approach RPZ.

Estimated Cost: $9,250,000

- Alternative 1C: Alternative 1C would displace the Runway 3 threshold by 1,495 feet and the Runway 21 threshold by 1,212 feet. This alternative would upgrade Runway 3-21 to meet C-II design standards. This alternative would provide full RSA, ROFA and ROFZ lengths beyond the runway ends and each RPZ to be clear of roads. The major disadvantage to this alternative is the large reduction in available runway length (only 5,605 feet take off runway available for the CRJ-200) which significantly constrains the use of the future design aircraft at Canyonlands Field. It is therefore not considered to be a realistic alternative for the airport.

  Estimated Cost: $9,250,000

- Alternative 1D: Alternative 1D would displace the Runway 3 threshold by 539 feet and would realign approximately one mile of Highway 191 and the adjacent railroad tracks to the east by 450 feet outside of the Runway 3 departure/Runway 21 approach RPZ. This alternative would upgrade Runway 3-21 to meet C-II design standards. This alternative would provide RSA, ROFA and ROFZ lengths beyond the runway ends free of any penetrations and/or incompatible land uses. The major advantages to this alternative are the relocation of Highway 191 out of the Runway 3 departure/Runway 21 approach RPZ and lesser comparative impacts to available runway length. The major disadvantage to this alternative is the substantial cost, environmental impacts and timeframe associated with the realignment of Highway 191, the railroad tracks and burial of the power-lines and is therefore not considered to be realistic. Furthermore, as described in the attached letter, the Utah Department of Transportation Division of Traffic Management does not support the realignment of Highway 191. (Appendix A)

  Estimated Cost: $37,000,000

Alternative 2 – Shift Runway 3-21 and Realign Blue Hills Road: Alternative 2 includes the shifting of Runway 3-21 to the southwest, providing a runway length of 7,100 and the realignment of Blue Hills Road around the RPZ to meet C-II design standards. Two variations of Alternative 2 were evaluated, are listed below and are depicted in the attached figures.

- Alternative 2A: Alternative 2A would shift Runway 3-21 by 252 feet to the southwest. Alternative 2A would also realign Blue Hills Road to be located outside all imaginary surfaces. This alternative would upgrade Runway 3-21 to meet C-II design standards. This alternative would provide RSA, ROFA and ROFZ lengths beyond the runway ends free of any penetrations and/or incompatible land uses. This alternative would also provide the Runway 21 departure/Runway 3 approach RPZ to be clear of Blue Hills Road. The major advantages to this alternative include maintaining the existing runway

length and clearing the higher use RPZ of Blue Hills Road. The major disadvantages to this alternative are that Highway 191 remains within the Runway 3 departure/Runway 21 approach RPZ, partial relocation of the adjacent wash (Bureau of Land Management and US Army Corps of Engineers coordination required), potential impacts to archaeological sites, requires the acquisition of Bureau of Land Management (BLM) land and would delay the upgrade by four to six years.

Estimated Cost: $10,750,000

- Alternative 2B: Alternative 2B would shift Runway 3-21 by 1,012 feet to the southwest. Alternative 2B would also realign Blue Hills Road to be located outside the RPZs. This alternative would upgrade Runway 3-21 to meet C-II design standards. This alternative would provide RSA, ROFA and ROFZ lengths beyond the runway ends and each RPZ. The major advantages to this alternative include maintaining the existing runway length and the imaginary surfaces being free of penetrations and incompatible land uses. The major disadvantages to this alternative would be increased development cost, higher potential for environmental impacts, acquisition of BLM land, full relocation or culverting of the adjacent wash (BLM and US Army Corps of Engineers coordination required), constraints caused by the adjacent high-pressure subterranean gas lines, potential impacts to archaeological sites and would delay the upgrade by five to seven years.

  Estimated Cost: $15,500,000

Alternative 3 – Construct New Runway: Alternative 3 the construction of a new Runway 3-21 which meets design standards for ARC C-II to allow the safe operation of the future design aircraft at Canyonlands Field. Alternative 3 is depicted in the attached figures.

- Alternative 3: Alternative 3 would construct a new Runway 3-21 located 400 feet to the northwest of the existing runway centerline. The future Runway 3-21 would be 7,100 feet long and would meet C-II design standards. The major advantages to this alternative include the future RPZ, RSA, ROFA and ROFZ all being clear of penetrations and construction occurring with minimal impact on airport activity. The major disadvantages to this alternative include a significant cost differential, potentially higher environmental impacts and a timeframe of seven to nine years to achieve C-II design standards. The extended project timeline would likely produce greater lost economic opportunities for the region.

  Estimated Cost: $30,000,000

Preferred Alternative Summary

A two-phased approach to the C-II ARC upgrade has been selected as the preferred alternative. Phase I (Alternative 1A) would displace both runway thresholds and construct the runway to meet C-II design standards within 18 months. Phase II (Alternative 2A) would shift Runway 3-21

to the southwest by 252 feet to eliminate the displaced thresholds and realign Blue Hills Road within three to five years.

Practicability Assessment

Each Alternative has been scored to determine practicability. Each factor is given a rating of one to five, with lower figures meaning increased favorability.

Runway 3-21 Alternative Practicability Assessment Matrix

Alternative	Cost	Constructability	Environmental	Time Frame	Other Factors	Total Score
1A	1	1	1	1	2*	5
1B	2	1	1	1	3*	7
1C	2	1	1	1	4*	8
1D	5	5	5	5	5**	20
2A	3	2	3	4	2*	10
2B	4	3	4	4	3*	14
3	5	5	5	5	5***	20
1A and 2A	4	2	3	3	2*	11

Scale:

1- Low
2- Below Average
3- Average
4- Above Average
5- High

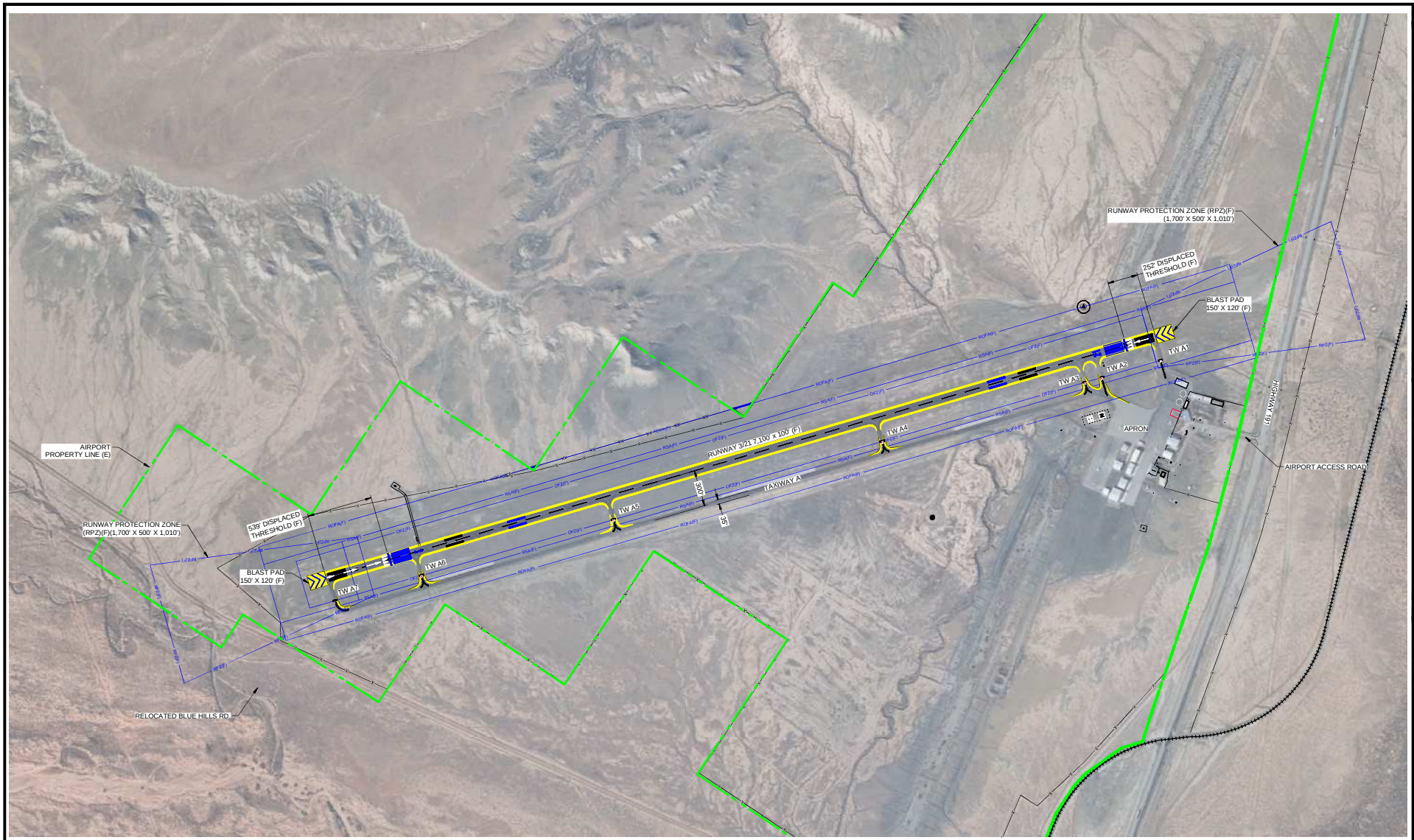
* Factor scale determined by use of displaced thresholds
**Factor scale determined by impacts of rerouting Highway 191
***Factor scale determined by economic impacts of project funding timeline

Agencies Involved

The following federal, state and local transportation agencies are involved or interested in the issue:

- Federal Aviation Administration
- Utah Department of Transportation, Division of Aeronautics
- Utah Department of Transportation, Division of Traffic Management

Appendix A



DECLARED DISTANCES		
ITEM	FUTURE	
	RW 3	RW 21
TAKEOFF RUN AVAILABLE (TORA) (FT)	6848'	6561'
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	7100'	7100'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	6848'	6561'
LANDING DISTANCE AVAILABLE (LDA) (FT)	6309'	6309'

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- EXISTING PROPERTY LINE
- FUTURE LEASE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

ARMSTRONG CONSULTANTS

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	146251	01/2015	C-II ARC ALTERNATIVE 1	6251613	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM (AIP) GRANT PROVIDED BY THE FEDERAL AVIATION ADMINISTRATION (FAA). THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE BY THE FAA OF THE FINAL PRODUCT OF THIS PROJECT IS CONTINGENT UPON THE FAA'S ASSESSMENT OF THE ENGINEERING, ECONOMIC, ENVIRONMENTAL, AND OTHER ASPECTS OF THE PROJECT. THERE MAY DOES IT IMPLIED THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE EXEMPT FROM ENVIRONMENTAL REVIEW.

C-II ARC
UPGRADE
ALT. 1A

Sheet 1 of 1

DECLARED DISTANCES

ITEM	FUTURE	
	RW 3	RW 21
TAKEOFF RUN AVAILABLE (TORA) (FT)	6848'	6561'
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	7100'	7100'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	6848'	6561'
LANDING DISTANCE AVAILABLE (LDA) (FT)	5349'	5349'

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE LEASE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

400 0 400 800
SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	14-0251	03/2015	C-II ARC ALTERNATIVE 1	6251614	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM (AIP) GRANT FUNDS ADMINISTERED BY THE FEDERAL AVIATION ADMINISTRATION (FAA). THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IMPLY ITS APPROVAL OF THE PROJECTS HEREIN. ALTHOUGH THE FAA HAS FUNDED THE PREPARATION OF THIS REPORT, IT MAY NOT BE SUITABLE FOR ENVIRONMENTAL PURPOSES. THERE MAY ALSO BE OTHER PROJECTS OR ALTERNATIVES WHICH MAY BE ENVIRONMENTALLY ACCEPTABLE OR WORKABLE. THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WORKABLE ONLY IF IT IS CONSISTENT WITH APPLICABLE STATE AND LOCAL LAWS.

C-II ARC
UPGRADE
ALT. 1B

Sheet: 1 of: 1

DECLARED DISTANCES

ITEM	FUTURE	
	RW 3	RW 21
TAKEOFF RUN AVAILABLE (TORA) (FT)	6848'	6561'
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	7100'	7100'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	6848'	6561'
LANDING DISTANCE AVAILABLE (LDA) (FT)	4393'	4393'

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- EXISTING PROPERTY LINE
- FUTURE LEASE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

400 0 400 800
SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	14025.1	03/2015	C-II ARC ALTERNATIVE 1	6251615	GWK	JMR	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM GRANTS FROM THE FEDERAL AVIATION ADMINISTRATION. HOWEVER, THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IMPLY ITS APPROVAL OF THE PROJECTS HAVING BEEN STUDIED OR RECOMMENDED IN THE REPORT, NOR DOES IT COMMIT THE FAA TO FINANCIAL PARTICIPATION IN THE PROJECTS. THERE MAY DOES IT IMPLIES THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE EXPEDITIONS IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

C-II ARC
UPGRADE
ALT. 1C

Sheet: 1 of: 1

DECLARED DISTANCES

ITEM	FUTURE	
	RW 3	RW 21
TAKEOFF RUN AVAILABLE (TORA) (FT)	7100'	6561'
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	7100'	7100'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	7100'	6561'
LANDING DISTANCE AVAILABLE (LDA) (FT)	6561'	6561'

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE LEASE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

ARMSTRONG CONSULTANTS

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	146251	01/2015	C-II ARC ALTERNATIVE 1	6251618	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM (AIP) FUNDED BY THE FEDERAL AVIATION ADMINISTRATION (FAA). THE CONTENTS OF THIS DOCUMENT REFLECT THE VIEWS OF THE CONSULTANTS WHO ARE RESPONSIBLE FOR THE FACTS AND ACCURACY OF THE DATA PRESENTED HEREIN. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE FAA TO PROVIDE ADDITIONAL FUNDING. IT MAY BE EXPECTED THAT THE FAA WILL ASSIST IN THE PROTECTION OF THE AIRSPACE ASSOCIATED WITH THIS AIRPORT. THERE MAY DOES IT IMPLY THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE EXPECTED TO BE APPROVED IN ACCORDANCE WITH APPLICABLE STATE AND FEDERAL LAWS.

C-II ARC
UPGRADE
ALT. 1D

Sheet: 1 of: 1

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE PROPERTY LINE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

ARMSTRONG CONSULTANTS

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	146251	03/2015	C-II ARC ALTERNATIVE 2	6251616	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM (AIP) GRANT FUNDS ADMINISTERED BY THE FEDERAL AVIATION ADMINISTRATION (FAA). THE CONTENTS OF THIS DOCUMENT DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE BY THE FAA OF THE FINAL PRODUCT OF THIS PROJECT IS CONDITIONED UPON THE FAA'S RIGHT TO REVIEW AND REJECT ANY PORTION THEREOF DEEMED TO BE INCORRECT, THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD NOT SIGNIFICANTLY AFFECT THE ENVIRONMENT IN A MANNER DEEMED UNACCEPTABLE BY THE FAA.

C-II ARC
UPGRADE
ALT. 2A

Sheet: 1 of: 1

LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE PROPERTY LINE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

ARMSTRONG CONSULTANTS

400 0 400 800

SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

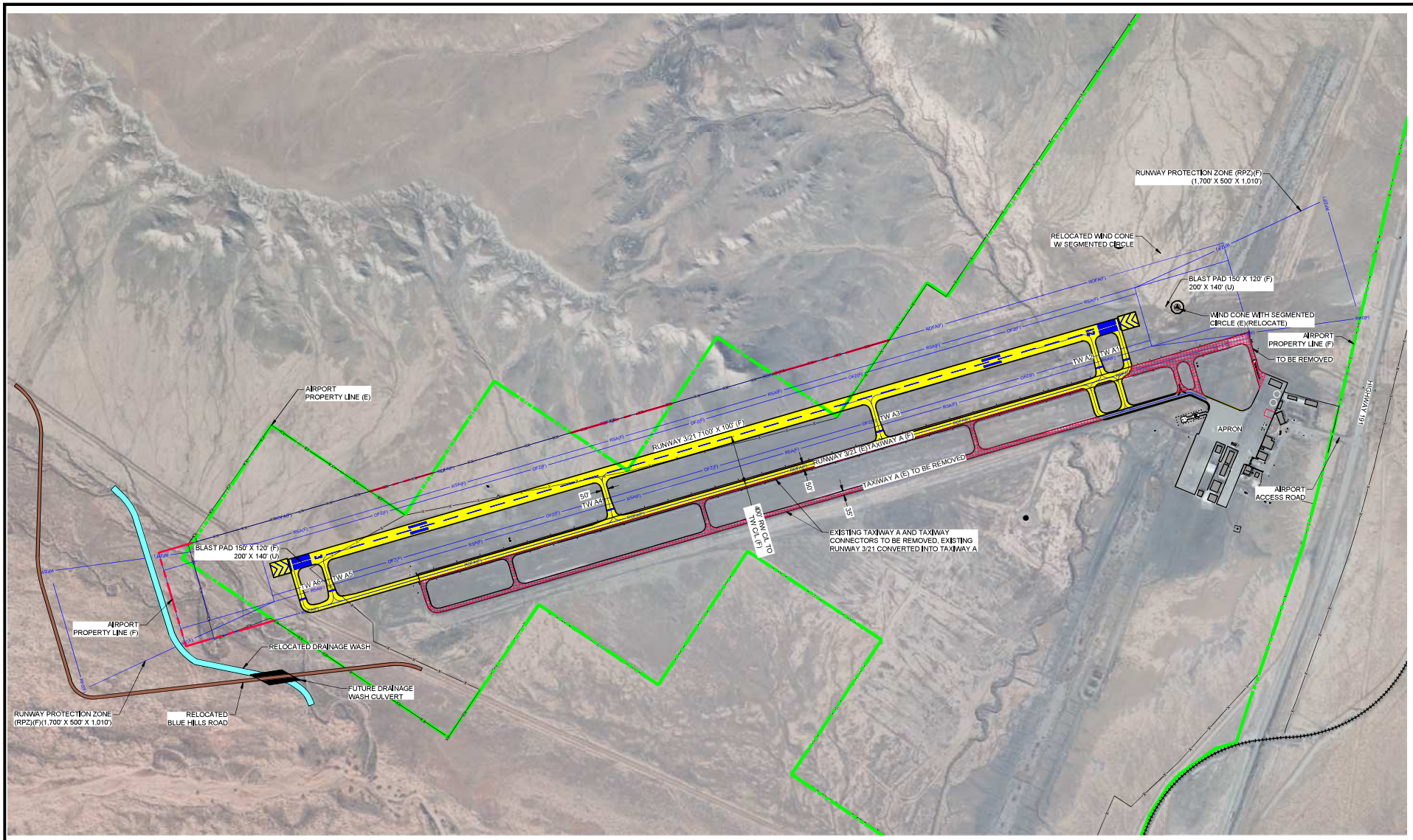
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	146251	01/2015	C-II ARC ALTERNATIVE 2	6251617	GWK	JMR	JZP

THE REPRODUCTION OF THIS DOCUMENT MAY NOT BE REPORTED, OR PART THEREOF, THE AIRPORT OWNOUNDERT PROVIDING THE ARMSTRONG CONSULTANTS, INC. IS NOT LIABLE FOR ANY DAMAGES ARISING FROM THE REPRODUCTION OF THIS DOCUMENT. THE CONTENTS DO NOT INCLUDE ANY ASSUMPTIONS OR OPINIONS REGARDING FUTURE LEGISLATIVE OR REGULATORY ACTIONS, OR ANY OTHER ACTIONS BEYOND THE CONTROL OF THE FAA. ACCEPTANCE BY THE FAA OF THE ALP DOES NOT IMPLY THE FAA WILL FUND THE PROJECTS IN THE OPTIONAL ANNUAL FORECAST OF THE ALP. ACCEPTANCE BY THE FAA OF THE ALP DOES NOT IMPLY THE FAA WILL FUND THE PROJECTS DEPICTED. THERE MAY ALSO BE ADDITIONAL PROJECTS NOT DEPICTED. THERE MAY ALSO BE PROJECTS DEPICTED THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD NOT BE EXPECTED TO BE ACCEPTABLE WITH MITIGATION IN PLACE.

C-II ARC
UPGRADE
ALT. 2B

Sheet 1 of 1



LEGEND

- FUTURE ASPHALT PAVEMENT
- FUTURE ASPHALT PAVEMENT MARKINGS
- FUTURE RELOCATED DIRT ROAD
- FUTURE RELOCATED DRAINAGE WASH
- TO BE REMOVED
- EXISTING PROPERTY LINE
- FUTURE PROPERTY LINE
- EXISTING PERIMETER FENCE
- FUTURE PERIMETER FENCE
- RAILROAD

400 0 400 800
SCALE IN FEET

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
www.armstrongconsultants.com

CANYONLANDS FIELD
GRAND COUNTY, UTAH

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Approvd.
1	146251	01/2015	C-II ARC ALTERNATIVE 3	6251606	GWK	JMR	JZP

THE REPRESENTATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM (AIP) OF THE FEDERAL AVIATION ADMINISTRATION (FAA). HOWEVER, THE CONTENTS PRESENTED HEREIN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN EXTEND TO ITS CONTENTS OR TO ANY PROJECT OR PROGRAM REPRESENTED IN THIS REPORT. ACCEPTANCE DOES NOT MEAN THE FAA ENDORSES OR APPROVES THE ENTITIES WHO PREPARED THE REPORT OR THE PROJECTS DESCRIBED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD BE EligIBLE FOR FEDERAL ASSISTANCE.

C-II ARC
UPGRADE
ALT. 3

Sheet: 1 of: 1

Appendix A

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

DEPARTMENT OF TRANSPORTATION

CARLOS M. BRACERAS, P.E.
Executive Director

SHANE M. MARSHALL, P.E.
Deputy Director

March 24, 2015

Mr. John Bauer
FAA Denver Airport Districts Office
26805 East 68th Avenue, Suite 224
Denver, CO 80249-6361

Dear Mr. Bauer:

RE: Moab-Canyonlands Airport Master Plan Update

Armstrong Engineers has been contracted to perform a Master Plan Update and Environmental Assessment for the Moab-Canyonlands Airport in southeastern Utah. The Master Plan is currently in the alternatives stage and has identified a change to the future critical aircraft which will require a larger Runway Protection Zone (RPZ).

In discussing alternatives, your staff has indicated that all projects involving a dimensional change to the RPZ that contain an incompatible land use need to be coordinated through FAA Headquarters. The Utah Department of Transportation has been asked to consider the relocation of SR-191 outside of the existing and future RPZ as a possible alternative.

State Route 191 is located just east of the airport and runs through the proposed approach RPZ for Runway 21 and departure RPZ for Runway 3. The purpose of this letter is to make you aware that a relocation of the state highway outside of the runway protection zone would <u>not</u> be feasible due to the following reasons:

- Re-aligning the highway would create new horizontal curves that create highway safety concerns (SR-191 is also a major truck route).

- A railroad line runs to the east of the state highway. There does not appear to be enough right-of-way to accommodate a re-aligned highway and a required railroad safety zone.

- Re-aligning SR-191 may impact an existing adjacent highway structure over the railroad.

The State of Utah is very supportive of efforts by the County to maintain commercial service to the Moab-Canyonlands Airport. Please consider our concerns and comments as you review design allowances for this project.

Sincerely,

Jason E. Davis, P.E.
Director of Operations

JED/MS/cwn

CC: Carlos Braceras, UDOT Executive Director
Shane Marshall, UDOT Deputy Director
Rick Torgerson, UDOT Region 4 Director
Pat Morley, UDOT Director of Aeronautics
Bill Lawrence, UDOT Director of Program Finance
Matt Swapp, UDOT Division of Aeronautics Program Engineer

APPENDIX D

ENVIRONMENTAL OVERVIEW

SUPPORTING DOCUMENTATION

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

APPENDIX D
ENVIRONMENTAL OVERVIEW SUPPORTING DOCUMENTATION

1.1 Introduction

This appendix contains the supporting documentation for the analysis conducted of the potential for environmental impacts as a result of the recommended development at Canyonlands Field. The list of supporting documents is included in **Table 1**.

Table 1 Appendix Contents

Appendix Location	Documentation	Providing Agency	Evaluated NEPA Category
D-1	Non-Attainment Map	Environmental Protection Agency	Air Quality
D-2	Threatened and Endangered Species List, Grand County, Utah	U.S. Fish and Wildlife Service	Threatened or Endangered Species and Biological Resources
D-3	National Park Vicinity Map	National Park Service	Department of Transportation (DOT) Act, Section 4(f)
D-4	Farmland Map	U.S. Department of Agriculture	Farmlands
D-5	Floodplains Coordination	Grand County, Utah	Floodplains
D-6	Wetlands Map	U.S. Fish and Wildlife Service	Wetlands
D-7	Wild and Scenic River Vicinity Map	U.S. National Wild and Scenic Rivers System	Wild and Scenic Rivers

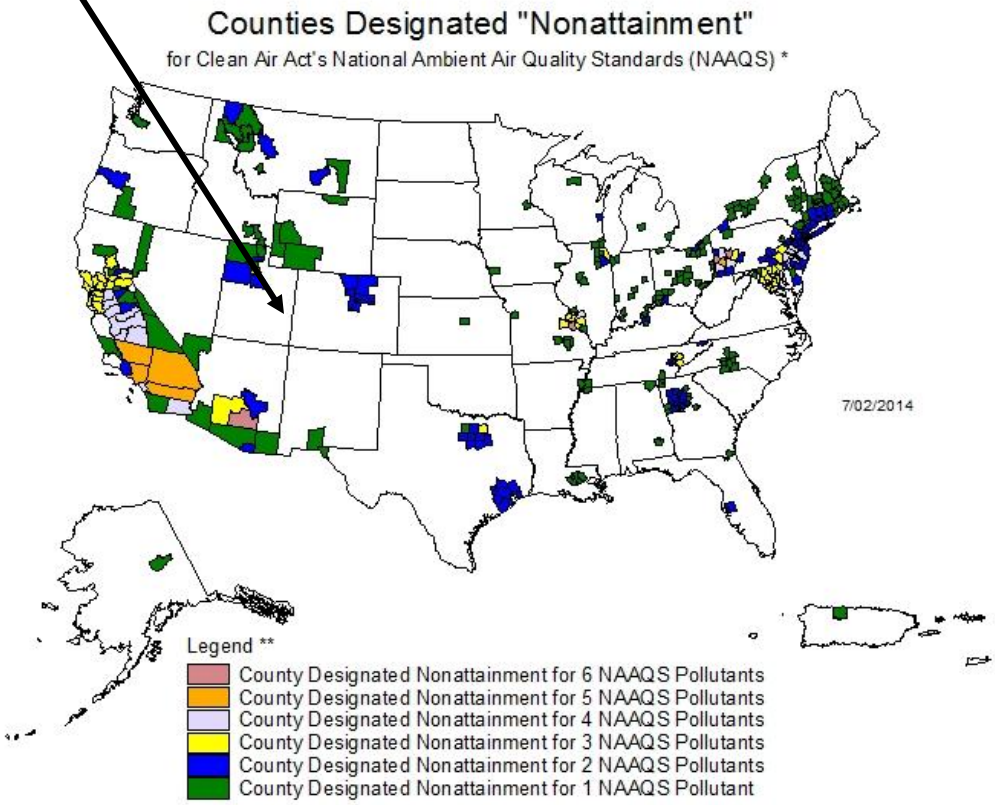
APPENDIX D-1

NON-ATTAINMENT MAP

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

Canyonlands Field



Guam - Piti and Tanguisson Counties are designated nonattainment for the SO2 NAAQS

* The National Ambient Air Quality Standards (NAAQS) are health standards for Carbon Monoxide, Lead (1978 and 2008), Nitrogen Dioxide, 8-hour Ozone (1997 and 2008), Particulate Matter (PM-10 and PM-2.5 (1997 and 2006)), and Sulfur Dioxide.(1971 and 2010)

** Included in the counts are counties designated for NAAQS and revised NAAQS pollutants. 1-hour Ozone is excluded. Partial counties, those with part of the county designated nonattainment and part attainment, are shown as full counties on the map.

APPENDIX D-2

THREATENED AND ENDANGERED SPECIES LIST

GRAND COUNTY, UTAH

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Utah Ecological Services Field Office
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UT 84119
PHONE: (801)975-3330 FAX: (801)975-3331
URL: www.fws.gov; www.fws.gov/utahfieldoffice/

Consultation Code: 06E23000-2015-SLI-0167 April 30, 2015
Event Code: 06E23000-2015-E-00538
Project Name: Canyonlands Field AMP

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Canyonlands Field AMP

Official Species List

Provided by:

Utah Ecological Services Field Office
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UT 84119
(801) 975-3330
http://www.fws.gov
http://www.fws.gov/utahfieldoffice/

Consultation Code: 06E23000-2015-SLI-0167
Event Code: 06E23000-2015-E-00538

Project Type: Transportation

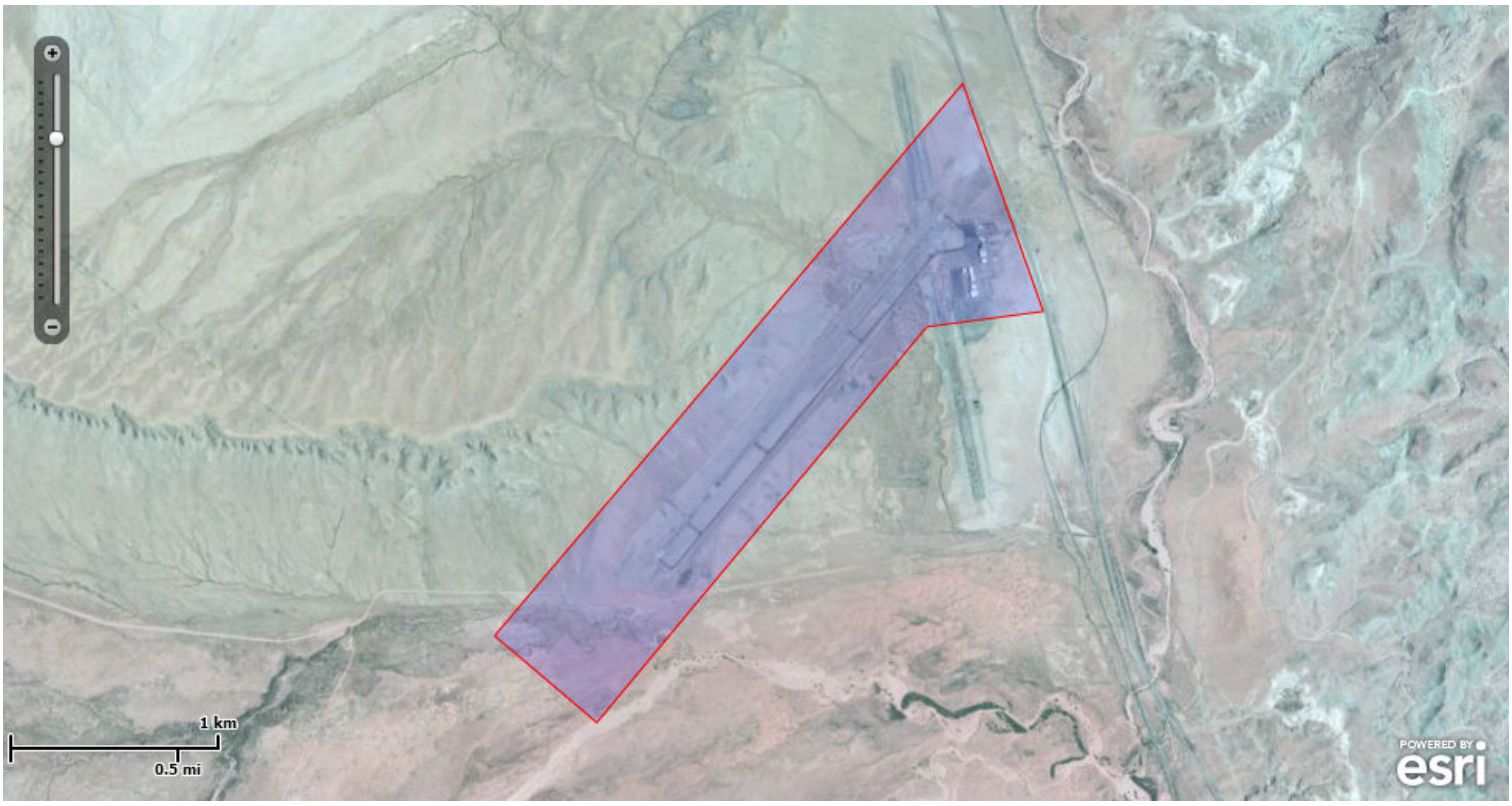
Project Name: Canyonlands Field AMP
Project Description: The T&E list is requested to determine environmental impacts for recommended airfield improvements at Canyonlands Field, Grand County, Utah.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

United States Department of Interior
Fish and Wildlife Service

Project name: Canyonlands Field AMP

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-109.7718125 38.7440898, -109.7458616 38.7679679, -109.7413984 38.7581164, -109.7478571 38.7574438, -109.766152 38.7403409, -109.7718125 38.7440898)))

Project Counties: Grand, UT

Endangered Species Act Species List

There are a total of 11 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
California condor *(Gymnogyps californianus)* Population: U.S.A. (specific portions of Arizona, Nevada, and Utah)	Experimental Population, Non-Essential		Species is considered Experimental non-essential population
Greater sage-grouse *(Centrocercus urophasianus)* Population: entire	Candidate		
Gunnison sage-grouse *(Centrocercus minimus)* Population: entire	Threatened		
Mexican Spotted owl *(Strix occidentalis lucida)* Population: Entire	Threatened	Final designated	
Southwestern Willow flycatcher *(Empidonax traillii extimus)* Population: Entire	Endangered	Final designated	
Yellow-Billed Cuckoo *(Coccyzus americanus)* Population: Western U.S. DPS	Threatened	Proposed	

Fishes			
Bonytail chub *(Gila elegans)* Population: Entire	Endangered	Final designated	
Colorado pikeminnow *(Ptychocheilus lucius)* Population: Entire, except EXPN	Endangered	Final designated	
Humpback chub *(Gila cypha)* Population: Entire	Endangered	Final designated	
Razorback sucker *(Xyrauchen texanus)* Population: Entire	Endangered	Final designated	
Flowering Plants			
Jones Cycladenia *(Cycladenia humilis var. jonesii)*	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

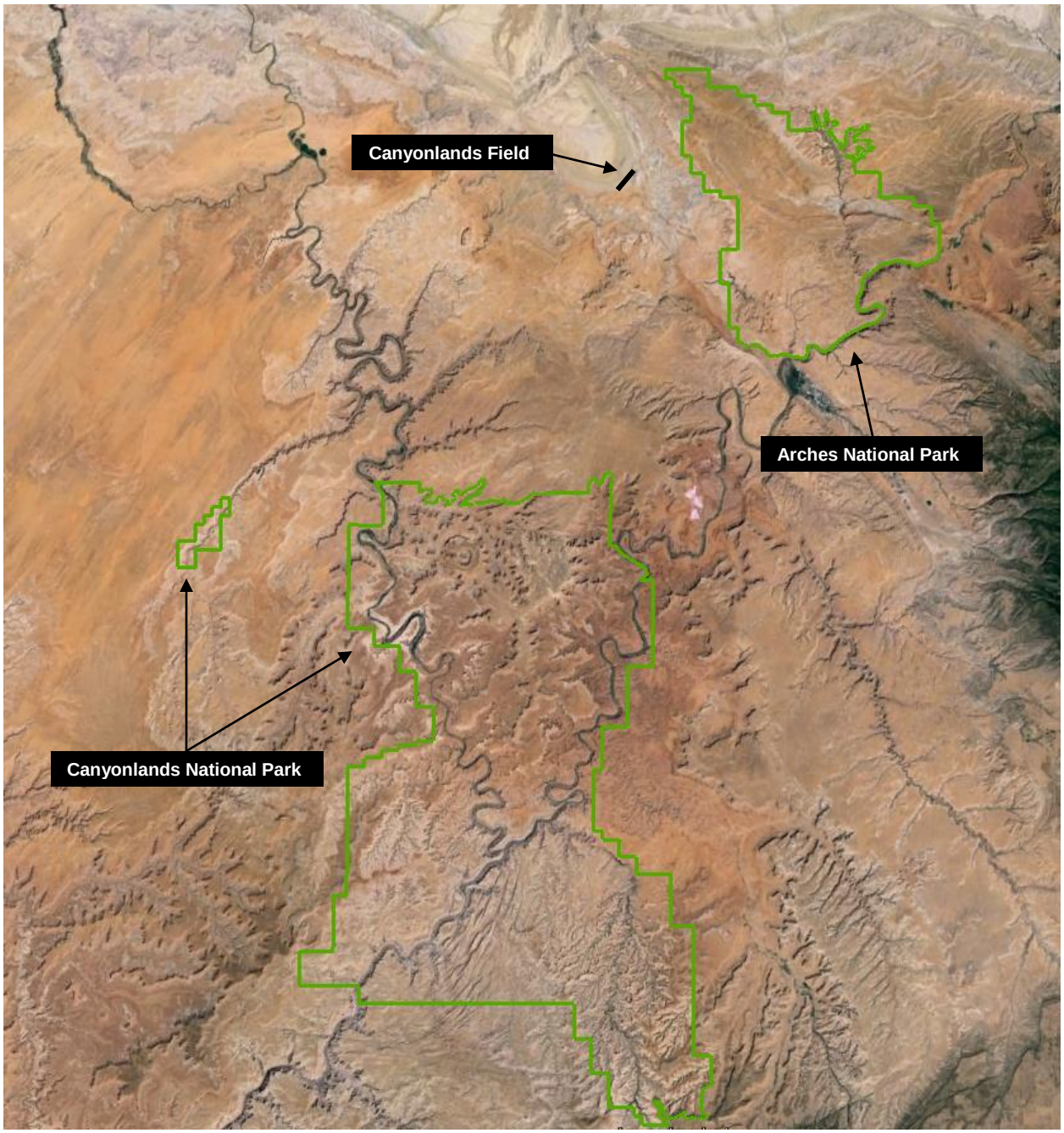
APPENDIX D-3

NATIONAL PARK VICINITY MAP

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

Canyonlands Field Location in Relation to U.S. National Parks



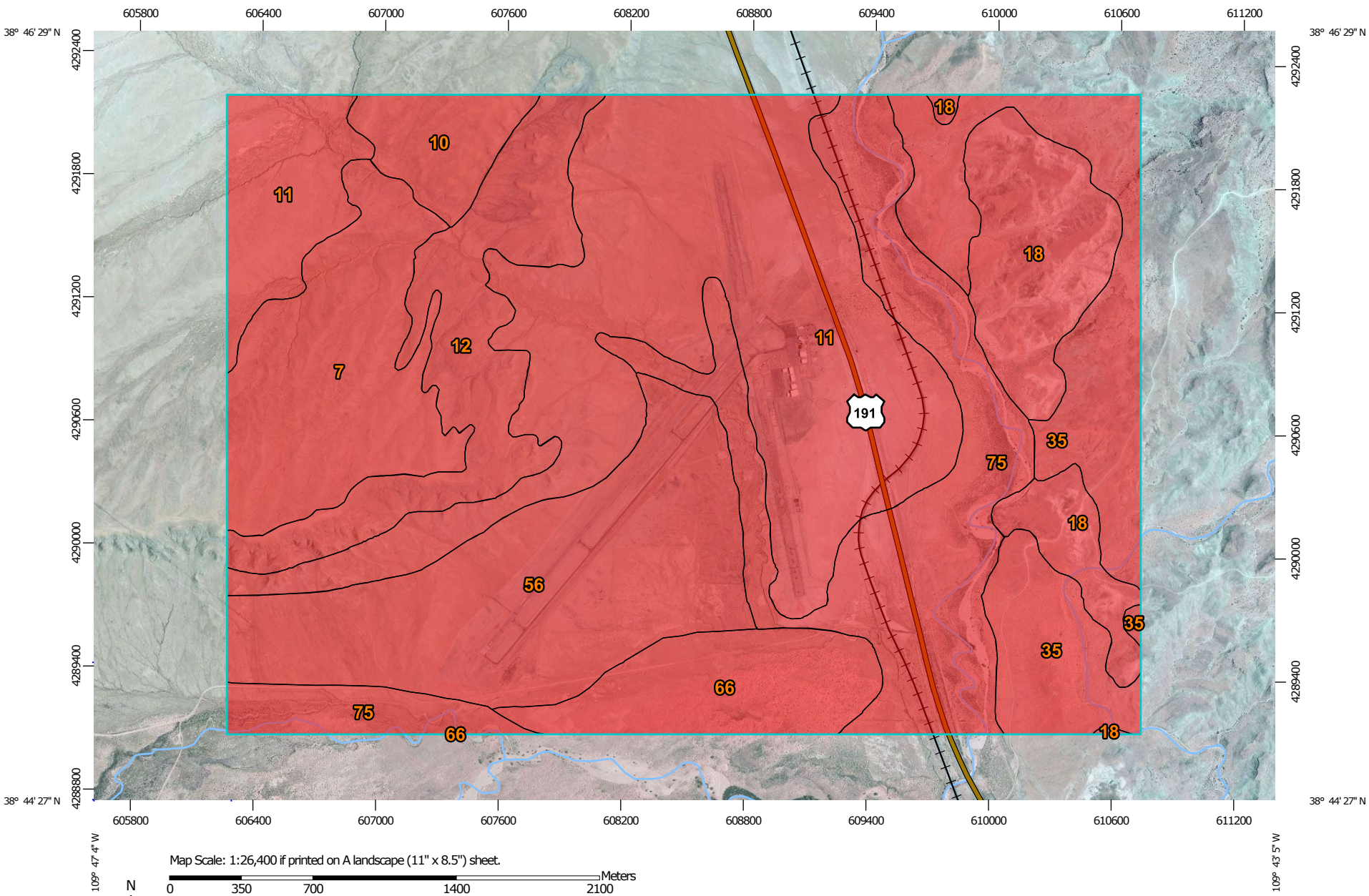
APPENDIX D-4

FARMLAND MAP

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

Farmland Classification—Grand County, Utah - Central Part
(Canyonlands Field)



Map Scale: 1:26,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 350 700 1400 2100

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grand County, Utah - Central Part
Survey Area Data: Version 10, Aug 8, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 23, 2010—Jun 24, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Farmland Classification— Summary by Map Unit — Grand County, Utah - Central Part (UT624)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
7	Blueflat complex	Not prime farmland	314.4	9.1%
10	Chipeta silty clay loam, 10 to 25 percent slopes	Not prime farmland	86.8	2.5%
11	Chipeta complex	Not prime farmland	963.4	27.8%
12	Chipeta-Badland complex	Not prime farmland	274.2	7.9%
18	Hanksville family-Badland complex	Not prime farmland	261.8	7.6%
35	Moenkopie-Rock outcrop complex	Not prime farmland	376.4	10.9%
56	Sagers silt loam	Not prime farmland	492.8	14.2%
66	Sheppard fine sand, 2 to 10 percent slopes	Not prime farmland	172.7	5.0%
75	Toddler-Ravola-Glenton families association	Not prime farmland	516.8	14.9%
Totals for Area of Interest			**3,459.4**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

APPENDIX D-5

FLOODPLAINS COORDINATION

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

861 Rood Avenue
Grand Junction, Colorado 81501
Phone: 970.242.0101
Fax: 970.241.1769
www.armstrongconsultants.com
email: jrostas@armstrongconsultants.com

Memo

To: **Jeff Whitney, Floodplain Administrator, Grand County, Utah**

From: **John M. Rostas, Airport Planner, Armstrong Consultants, Inc.**

Date: **Friday, May 01, 2015**

Subject: **Canyonlands Field – Floodplain Coordination**

Jeff Whitney, the Floodplain Administrator of Grand County, was contacted via telephone on Friday, May 01, 2015 at 11:20 A.M. (Mountain Standard Time) in regards to the potential of floodplains located at Canyonlands Field. During the conversation he stated that Grand County was typically not mapped by the Federal Emergency Management Agency's Flood Insurance Rate Maps with the exception of four locations (two along the Green River, one in Moab and one in Spanish Valley). Canyonlands Field was not included in the mapping areas. When asked if the recommended development for the airport would impact any floodplains he said it was unlikely. Therefore, there should be no potential for impacts to floodplains.

APPENDIX D-6

WETLANDS MAP

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

U.S. Fish and Wildlife Service

National Wetlands Inventory

Canyonlands Field

Feb 18, 2015

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

Riparian Status

- Digital Data

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

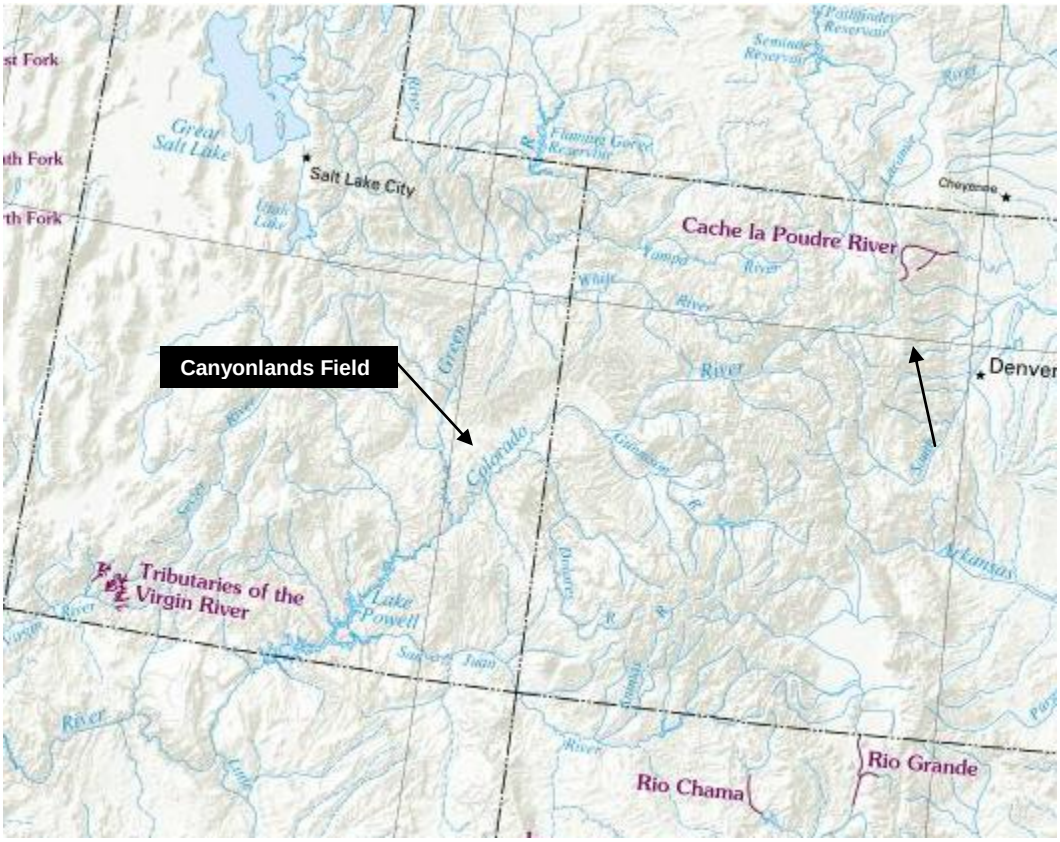
APPENDIX D-7

WILD AND SCENIC RIVER VICINITY MAP

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

Canyonlands Field Location in Relation to Wild and Scenic Rivers



APPENDIX E

PUBLIC INVOLVEMENT

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

CANYONLANDS FIELD
AIRPORT MASTER PLAN

KICK-OFF MEETING

November 21, 2014
10:00 A.M.
Canyonlands Field Airport Manager Office

MEETING SUMMARY

Purpose:

Present and discuss the purpose of the ongoing Airport Master Plan project with the Canyonlands Field Technical Advisory Committee.

Attendees:

Judd Hill, Airport Manager
Bill Joss, Airport Board Member
Mark Francis, Redtail Aviation
Justin Pietz, Armstrong Consultants, Inc.
Bill Groff, Airport Board Chairman
Bill Hawley, Airport Board Member
Dennis Corsi, Armstrong Consultants, Inc.
John Rostas, Armstrong Consultants, Inc.

Summary:

A Master Plan kick-off presentation was made to the Canyonlands Field Technical Advisory Committee (TAC) which comprised of eight individuals including representatives from the Airport Management, Airport Board and Armstrong Consultants, Inc. (ACI).

ACI briefly summarized the presentation agenda. Upon the start of the presentation, ACI defined an Airport Master Plan as a guide which evaluates forecasted demand and identifies the assets and deficiencies of the airport. The report will also provide an Airport Layout Plan (ALP) drawing which will serve as a visual depiction of the existing future airport development and will be necessary for obtaining future Federal and/or State funding. ACI further discussed the objectives of the Airport Master Plan and the role the TAC will serve throughout the planning process.

ACI described the process involved in the development of an Airport Master Plan. Currently, Working Paper #1 is in progress and will consist of an inventory of airport facilities and forecast of aviation demand. Working Paper #2 would commence immediately after Working Paper #1 is distributed and will describe recommended development for the airport. ACI also explained the development of the ALP drawing set and 20-year Capital Improvement Plan (CIP) would occur once the recommended development has been approved by the TAC. ACI further stated the accelerated pace the Airport Master Plan will be produced at.

The technical aspects of the Airport Master Plan were discussed. Design standards, types of aircraft, approach categories and design dimensions were explained. The current Runway Design Code (RDC) for Runway 3-21 is B-II-5,000 and the types of aircraft up to and including that category were discussed, which include single and multi-engine turbine aircraft and smaller jet powered aircraft. The Airport Reference Code (ARC) is the highest RDC available, which is B-II-5,000. The airport configuration was also discussed. Additional discussion was given regarding the steps necessary to upgrade the RDC of Runway 3-21 to accommodate C-II aircraft.

Planning considerations were further discussed. ACI explained the typical areas and factors that are evaluated while undergoing an Airport Master Plan such as fleet mix runway and taxiway configuration, apron layout, future hangar location, weather observation systems and fuel storage tanks. ACI further described the importance of the ALP and the need to be realistic about future development.

The presentation was concluded with an overview of the next steps for the project. Working Paper #1 will be distributed to the TAC and Staff, Federal Aviation Administration and Utah Department of Transportation for review and comment. After the comment and review of Working Paper #1, Working Paper #2 will be distributed which will include the Facility Requirements and Development Alternatives Chapter.

Throughout the presentation, several questions were asked regarding the project which included but are not limited to; the Environmental Assessment process for the C-II upgrade, project schedule, land acquisition, documenting aviation demand which is unable to utilize the airport, public relations and agency coordination. Additional discussion was provided by Redtail Aviation regarding forecasted business demand and potential impacts of construction at the airport.

Enclosures:

Project Task Summary
Project Schedule

CANYONLANDS FIELD
AIRPORT MASTER PLAN

DEVELOPMENT ALTERNATIVES TECHNICAL ADVISORY COMMITTEE MEETING

February 26, 2015
10:00 A.M. – 1:30 P.M.
Canyonlands Field Airport Manager Office

MEETING SUMMARY

Purpose:

Present and discuss the Development Alternatives developed as a part of the ongoing Airport Master Plan.

Attendees:

Judd Hill, Canyonlands Field
Bill Groff, Airport Board
Bill Hawley, Airport Board
John Sweeney, Federal Aviation Administration
Pat Morely, Utah Dept. of Transportation
Ruth Dillon, Grand County, Utah
Justin Pietz, Armstrong Consultants, Inc.
John Rostas, Armstrong Consultants, Inc.
Tammy McIlvain, Canyonlands Field
Bill Joss, Airport Board
Mark Francis, Redtail Aviation
Nate Hattleback, Federal Aviation Administration
Matthew Swapp, Utah Dept. of Transportation
Dennis Corsi, Armstrong Consultants, Inc.
Eric Trinklein, Armstrong Consultants, Inc.

Summary:

An Airport Master Plan presentation regarding the Development Alternatives was made at Canyonlands Field. Attendance at the meeting consisted of the Technical Advisory Committee (TAC), Airport Management, Grand County, Federal Aviation Administration (FAA), Utah Department of Transportation (UDOT) and Armstrong Consultants, Inc. (ACI).

The Airport Manager started by introducing each of the attendees and stated the overall purpose of the meeting. ACI then briefly described the overall goal of the meeting which is to determine the preferred development for the alternatives presented in the Airport Master Plan.

Due to an increasing pilot shortage caused by the increase in pilot hiring hour minimums, many regional carriers have began to reduce their fleet of aircraft with a capacity of less than 50 passengers. This includes aircraft such as the Beechcraft 1900, Bombardier/DeHavilland Dash-8, Embraer 120, 135 and Saab 340. These aircraft are typically being replaced by the 50-passenger Bombardier CRJ-200 and Embraer 140/145. Projections indicate that within ten to 15 years, the 50-passenger jet market will likely be replaced with 70 plus passenger jets such as the Bombardier CRJ-700/900, Bombardier CS100, Embraer 170/175 and the Mitsubishi Regional Jet.

Canyonlands Field is currently served with an Embraer 120, a 30-passenger seat turboprop, to Salt Lake City International Airport operated by SkyWest Airlines. This route is subsidized under the Essential Air Service Program. SkyWest Airlines has announced their intent to cancel service to Canyonlands Field effective April 30, 2015 due to the aforementioned fleet mix changes. The existing Runway 3-21 width of 75 feet and strength of 25,000 pounds is unable to accommodate the intended replacement aircraft, the Bombardier CRJ-200, which requires a 100 foot width and 55,000 pound strength.

ACI described how the forecasted fleet mix at Canyonlands Field would not be accommodated by the existing Runway 3-21 design standards. Improvements to the runway width, Runway Safety Area (RSA) and Runway Object Free Area (ROFA) would be needed to accommodate the forecasted short to medium-term fleet mix. Additionally, the runway centerline to taxiway centerline separation would also be increased to accommodate the forecasted long-term fleet mix. This would require an Airport Reference Code Upgrade of C-II in the short-term and C-III in the medium to long-term.

ACI presented each C-II ARC Upgrade alternative. Each alternative included a runway width of 100 feet and pavement strength of 55,000 pounds with the exception of Alternative 5.

Alternative 1 would include the displacement of the Runway 3 threshold by 252 feet and the Runway 21 threshold by 204 feet to accommodate the RSA and ROFA. Alternative 1 would cost approximately $9.2 million. The major advantages to this alternative include the relatively low short-term cost, minimal land acquisition and lower comparative environmental impacts. The major disadvantage to this alternative includes the use of declared distances which reduces the usable length of Runway 3-21. Alternative 1 would also be able to accommodate C-II aircraft in less time than the other alternatives.

Alternative 2 would shift Runway 3-21 by 260 feet to the southwest and relocate Blue Hills Road to accommodate the RSA and ROFA. Alternative 2 would cost approximately $10.25 million. Unlike Alternative 1, Alternative 2 would not require the use of declared distances. The major advantage to this alternative is the full use of the Runway 3-21 length. The major disadvantages to this alternative include the higher comparative costs, additional land acquisition and greater environmental impacts.

Alternative 3 would construct a new Runway 3-21. The new runway would be constructed to a length of 7,100 feet and would be situated to provide a runway centerline to taxiway centerline separation of 400 feet. The existing Runway 3-21 would be converted into a taxiway with a 50 foot width. Blue Hills Road and the adjacent wash would be realigned to accommodate the future Runway Protection Zone. Alternative 3 would cost approximately $26.2 million. The major advantages to this alternative include reduced closure time for Runway 3-21 during construction and the runway centerline to taxiway centerline separation would accommodate Runway Design Code C-III. The major disadvantages to this alternative include the highest comparative cost, greatest amount of land to be acquired and environmental impacts. FAA also stated this project could be completed, but it would likely be completed in phases and would take eight to ten years for completion.

Alternative 4 would shift Runway 3-21 by 204 feet to the northeast and realign U.S. Highway 191. Due to the substantial financial and environmental impacts of the realignment of U.S. Highway 191, Alternative 4 was not considered to be feasible. Therefore, Alternative 4 was not considered for further evaluation.

Alternative 5 is the no action alternative. Runway 3-21 would remain at a 75 foot width and RDC B-II. Alternative 5 was not considered feasible as it did not meet the airport's needs.

Throughout the presentation of Alternatives, questions were asked relating to the availability of funding, runway closure times, coordination of land acquisition with the Bureau of Land Management and impacts to airport tenants. The overall consensus was Alterative 1 was most desirable due to the ability to obtain a C-II runway in the shortest time. Alternative 3 was also viewed favorably, however, the extended duration of waiting for the project funding and increased environmental impacts were viewed as detrimental to short-term airport development.

It was ultimately agreed upon to achieve a C-II/C-III ARC Upgrade in three phases:

- Phase I: Displace Runway 3 and Runway 21 thresholds and increase runway width to 100 feet. (Alternative 1) (C-II ARC)
- Phase II: Shift Runway 3-21 by 252 feet to the southwest and relocate Blue Hills Road. Eliminate use of declared distances. (Alternative 2) (C-II ARC)
- Phase III: Relocate Taxiway A to accommodate a runway centerline to taxiway centerline separation of 400 feet. (C-III ARC)

Discussion was then given to the two crosswind runway alternatives. Alterative 1 would construct a crosswind runway to the north and Alternative 2 would construct a crosswind runway to the south. The

crosswind runway would be temporarily improved for use during runway construction. The permanent runway will be depicted on the Airport Layout Plan and would require future environmental analysis as well as FAA approval and activation. Both FAA and UDOT indicated the lack of funding available for the project but it could be completed with local funds.

The next step for the Airport Master Plan will be to release the Draft Report. The document will include the Airport Layout Plan drawing set, Environmental Overview Chapter and Financial Development Plan Chapter. The Draft Report will be available for review and comment by the TAC, FAA and UDOT. Once all comments have been addressed, the Airport Master Plan will be completed in the Final Report.

CANYONLANDS FIELD
AIRPORT MASTER PLAN

PUBLIC INFORMATION MEETING

March 3, 2015
5:00 P.M. – 7:30 P.M.
Moab Valley Fire District Station

MEETING SUMMARY

Purpose:

Present the Airport Master Plan preferred development to the public.

Attendees:

Canyonlands Field Airport Board
Representatives of Skydive Moab
Grand County Council Representative
Justin Pietz, Armstrong Consultants, Inc.
Citizens of Grand County, Utah
Judd Hill, Airport Manager
Representatives of Redtail Aviation
Dennis Corsi, Armstrong Consultants, Inc.
John Rostas, Armstrong Consultants, Inc.

Summary:

A Public Information meeting was held at the Moab Valley Fire District Station for the Canyonlands Field Airport Board, Airport tenants and citizens of Moab/Grand County. The meeting was to present the Airport Master Plan's preferred development selected by the Technical Advisory Committee (TAC) during the February 26, 2015 Development Alternatives Meeting. Attendance consisted of the TAC, Canyonlands Field Airport Board, Airport Management, Airport tenants, ACI and citizens of Grand County, Utah. The meeting coincided with a scheduled Canyonlands Field Airport Board Meeting.

At the conclusion of regular business, the Airport Board Chairman had ACI initiate their presentation of the preferred development.

ACI briefly described the overall goal of the meeting which is to present the preferred development for the alternatives selected by the TAC.

Due to an increasing pilot shortage caused by the increase in pilot hiring hour minimums, many regional carriers have began to reduce their fleet of aircraft with a capacity of less than 50 passengers. This includes aircraft such as the Beechcraft 1900, Bombardier/DeHavilland Dash-8, Embraer 120, 135 and Saab 340. These aircraft are typically being replaced by the 50-passenger Bombardier CRJ-200 and Embraer 140/145. Projections indicate that within ten to 15 years, the 50-passenger jet market will likely be replaced with 70 plus passenger jets such as the Bombardier CRJ-700/900, Bombardier CS100, Embraer 170/175 and the Mitsubishi Regional Jet.

Canyonlands Field is currently served with an Embraer 120, a 30-passenger seat turboprop, to Salt Lake City International Airport operated by SkyWest Airlines. This route is subsidized under the Essential Air Service Program. SkyWest Airlines has announced their intent to cancel service to Canyonlands Field effective April 30, 2015 due to the aforementioned fleet mix changes. The existing Runway 3-21 width of 75 feet and strength of 25,000 pounds is unable to accommodate the intended replacement aircraft, the Bombardier CRJ-200, which requires a 100 foot width and 55,000 pound pavement strength.

ACI described how the forecasted fleet mix at Canyonlands Field would not be accommodated by the existing Runway 3-21 design standards. Improvements to the runway width, runway pavement strength, Runway Safety Area (RSA) and Runway Object Free Area (ROFA) would be needed to accommodate the forecasted short to medium-term fleet mix. Additionally, the runway centerline to taxiway centerline separation would also be increased to accommodate the forecasted long-term fleet mix. This would require an Airport Reference Code Upgrade of C-II in the short-term and C-III in the medium to long-term.

ACI presented the preferred development alternative. The TAC had agreed to utilize a three-phase approach to achieve a C-II/C-III ARC Upgrade.

Phase I would include the displacement of the Runway 3 threshold by 252 feet and the Runway 21 threshold by 204 feet to accommodate the RSA and ROFA. The Runway 3-21 width would be increased to 100 feet and the pavement strength increased to 55,000 pounds. This phase would cost approximately $9.2 million.

Phase II would shift Runway 3-21 by 260 feet to the southwest and relocate Blue Hills Road to accommodate the RSA and ROFA. Phase II would remove the displaced thresholds on both ends of Runway 3-21 and bring the runway length back to 7,100 feet. This phase would cost approximately $1.75 million.

Phase III would shift Taxiway A by 100 feet to the south to provide a runway centerline to taxiway centerline separation of 400 feet to meet C-III design standards. The runway strength would also be increased to 85,000 pounds and increase the dimensions of the blast pads to 200 feet wide by 200 feet long. This phase would cost approximately $17.7 million.

Redtail Aviation requested the Airport Board also consider the construction of a new Runway 3-21 400 feet north of the existing runway. This alternative was previously discussed at the TAC Development Alternatives meeting and was not selected as the preferred development. Redtail stated the new runway would have fewer impacts to existing airport tenants as the runway would remain open during the majority of development.

Throughout the presentation of the preferred development, questions were asked relating to runway closure times, scheduling of the anticipated construction project and impacts to airport tenants. ACI stated they would further evaluate construction schedules which would have the lowest impact on the Airport's peak season. Additional mitigation to impacts to airport tenants includes the construction of a crosswind runway utilizing millings from the Runway 3-21 project. ACI further stated that the FAA and UDOT will not financially support this project and it would be funded through local means only. Skydive Moab stated they would be able to continue their operation without impact if this runway were available.

A motion to vote on the preferred development was brought forward and seconded. The Airport Board voted 4-2 in favor of the TAC's preferred alternative. The preferred development will be carried forward as the Airport Board's recommendation to the Grand County Council for vote on March 17, 2015.

GRAND COUNTY COUNCIL
REGULAR MEETING

Grand County Council Chambers
125 East Center Street, Moab, Utah

AGENDA
Tuesday, May 5, 2015

4:00 p.m.

- **Call to Order**
- **Pledge of Allegiance**
- **Approval of Minutes** (Diana Carroll, Clerk/Auditor)
  A. April 21, 2015 (County Council Meeting)
- **Ratification of Payment of Bills**
- **Elected Official Reports**
- **Council Administrator Report**
- **Department Reports**
  B. 2014 Building Inspection Report (Jeff Whitney, Chief Building Official/Community Floodplain Administrator)
- **Agency Reports** (none)
- **Citizens to Be Heard**
- **Presentations**
  C. The County Seat TV General Information Update (Chad Booth, Show Host and Executive Producer)
- **Discussion Items**
  D. Discussion on County Resource Management Plan (CRMP) (Council Member Jackson)
  E. Discussion on Calendar Items and Public Notices (KaLeigh Welch, Council Office Coordinator)
- **General Business- Action Items- Discussion and Consideration of:**
  F. Approving Proposed Substation and Distribution Line Easement and Right of Way Easement for Rocky Mountain Power at Canyonlands Field Airport (Debra Dull, Rocky Mountain Power, Customer and Community Manager; Dan Vink, Rocky Mountain Power, Distribution Manager; and Roger Rigby, Rocky Mountain Power, Director of Real Estate)
  G. Approving Airport Board Recommendation of a Three-Phase Alternative to Upgrade the Runway in Order to Develop the Airport Layout Plan for the Canyonlands Field Airport Master Plan (Judd Hill, Airport Manager and Armstrong Consultants)
  H. Adopting Proposed Ordinance Approving a Rezone Application from General Business (GB) to Small Lot Residential (SLR) for the Housing Authority of Southeastern Utah (HASU) Located at 1518 Murphy Lane (Zacharia Levine, Community Development Director)
  I. Approving Proposed Task Order Agreement with Horrocks Engineers for the Design of a Colorado River Water Load Out Facility Located at Approximately Mile Post (MP) 14 on SR-279 (Potash Road) (Zacharia Levine, Community Development Director)
  J. Approving Discretionary Funds and Contract Award to Code Publishing, Inc. for Providing Internet Hosting of the Grand County Land Use Code (LUC) and Associated Services (Zacharia Levine, Community Development Director)

K. Approving Proposed Cost Estimate from Archiplex Group for Architect Design Services for Step One, the Grand County Jail Remodeling Study and Step Two, Bid Ready Construction Documents (Rick Bailey, Emergency Management Director, by phone)

L. Approving Contract Award and Acceptance of a Professional Fee Proposal for Architectural Services for the Concept Design and Cost Study for the Emergency Medical Services (EMS) Building Project (Michelle Mefret, EMS Administrative Assistant)

M. Approving Bid Award for the Purchase of a John Deere 544K Loader for the Road Department (Bill Jackson, Road Supervisor and Glen Arthur, Assistant Road Supervisor)

N. Approving Bid Award for the Purchase of a Wausau RBT3296 TowPal Engine Powered Hydraulically Driven Towed Broom for the Road Department (Bill Jackson, Road Supervisor and Glen Arthur, Assistant Road Supervisor)

O. Adopting Proposed Resolution Approving the Council's Preliminary Recommendations, as Amended March 31, 2015, as the Formal Recommendations for Designations and Management Objectives for Congressman Rob Bishop's Proposed Public Lands Initiative, Postponed from April 21, 2015 (Ruth Dillon, Council Administrator)

- **Consent Agenda- Action Items**

P. Approving Proposed Lease Agreement with Century Equipment Company, Inc. for a Case 580SN Backhoe for the Road Department in the Yearly Amount of $4,360.00

Q. Ratifying the Chair's Signature on a Disadvantaged Business Enterprise (DBE) Program Policy Statement for Federal Financial Assistance from the Department of Transportation for Canyonlands Field Airport for FY 2015-2017

R. Ratifying the Chair's Signature on a Letter of Support for a Grant for the Moab Music Festival

S. Ratifying the Chair's Signature on an Advertising Contract with RV Life Magazine for the Moab Area Travel Council in the Amount of $3,915.00

T. Ratifying the Chair's Signature on an Insertion Order with GJSentinel.com for the Moab Area Travel Council in the Amount of $2,400.00

U. Ratifying the Chair's Signature on an Advertiser Testimonial Release and License with Comcast Spotlight for the Moab Area Travel Council

- **Public Hearings- Possible Action Items** (none)
- **General Council Reports and Future Considerations**
- **Closed Session(s)** (if necessary)
- **Adjourn**

NOTICE OF SPECIAL ACCOMMODATION DURING PUBLIC MEETINGS. In compliance with the Americans with Disabilities Act, individuals with special needs requests wishing to attend County Council meetings are encouraged to contact the County two (2) business days in advance of these events. Specific accommodations necessary to allow participation of disabled persons will be provided to the maximum extent possible. T.D.D. (Telecommunication Device for the Deaf) calls can be answered at: (435) 259-1346. Individuals with speech and/or hearing impairments may also call the Relay Utah by dialing 711. Spanish Relay Utah: 1 (888) 346-3162

It is hereby the policy of Grand County that elected and appointed representatives, staff and members of Grand County Council may participate in meetings through electronic means. Any form of telecommunication may be used, as long as it allows for real time interaction in the way of discussions, questions and answers, and voting.

At the Grand County Council meetings/hearings any citizen, property owner, or public official may be heard on any agenda subject. The number of persons heard and the time allowed for each individual may be limited at the sole discretion of the Chair. On matters set for public hearings there is a three-minute time limit per person to allow maximum public participation. Upon being recognized by the Chair, please advance to the microphone, state your full name and address, whom you represent, and the subject matter. No person shall interrupt legislative proceedings.

Requests for inclusion on an agenda and supporting documentation must be received by 5:00 PM on the Wednesday prior to a regular Council Meeting and forty-eight (48) hours prior to any Special Council Meeting. Information relative to these meetings/hearings may be obtained at the Grand County Council's Office**,** 125 East Center Street, Moab, Utah**; (**435**)** 259-1346**.**

A Council agenda packet is available at the local Library, 257 East Center St., Moab, Utah, (435) 259-1111 at least 24 hours in advance of the meeting.

GRAND COUNTY COUNCIL
182 North 500 West
Moab, Utah

April 21, 2015

The Grand County Council met in regular session on the above date at the Grand Center located at 182 North 500 West, Moab, Utah. Chairman Elizabeth Tubbs called the Council meeting to order at 4:00 p.m. In attendance were Council Members Elizabeth Tubbs, Jaylyn Hawks, Ken Ballantyne, Chris Baird, Rory Paxman, Lynn Jackson and Mary McGann, and along with Grand County Clerk/Auditor Diana Carroll and Council Administrator Ruth Dillon. The Pledge of Allegiance was led by Council Member Lynn Jackson.

Approval of Minutes (Diana Carroll, Clerk/Auditor)

A. March 16, 2015 (County Council Administrative Workshop: Public Lands Bill)

B. March 17, 2015 (County Council Meeting)

C. March 31, 2015 (County Council Special Meeting: Public Lands Bill)

D. April 7, 2015 (County Council Meeting)

MOTION: Motion by Council Member Chris Baird to approve the above minutes, with suggested corrections. Motion seconded by Council Member Mary McGann carried 7 – 0.

Ratification of Payment of Bills

MOTION: Motion by Council Member Chris Baird to approve payment of bills presented in the amount of $945,539.27. Accounts payable check numbers 87638 - 87596 totaling $763,212.46 and payroll in the amount of $182,326.81 confirming all bills presented were within budgeted appropriations. Motion seconded by Council Member Mary McGann carried 7 - 0 by roll-call vote

Council Administrator Report

Ruth Dillon reported attending a Chamber of Commerce meeting regarding congestion in Arches National Park and what the community is doing to help.

Department Reports

E. 2014 Maintenance Report (Marvin Day, Facilities Supervisor)

Grand County Facilities Supervisor Marvin Day gave a report on the Maintenance Department activities for 2014. The new roof project was recently completed. The Maintenance Department continues to have ongoing paved path maintenance projects.

F. Geographic Information System (GIS) Task Force Update (Matt Ceniceros, IT Director)

The GIS task force has reviewed the Implementation Strategy and has met as a group to review the proposal as a viable solution towards resolving County GIS issues. The group has agreed to recommend the Enterprise GIS solution using a special licensing agreement; as the preferred solution to the Council. Alternative solutions discussed were: continuing the status quo, an Enterprise GIS using State of Utah contract pricing or migrating to open source GIS solutions. The task force will continue to work on developing this solution by creating a more formal strategic plan, establishing systems architecture, providing estimated initial and on-going annual budgets and other necessary tasks once funding approval is given.

Grand County Community Development Director Zacharia Levine presented information regarding online access to the Grand County Land Use Code.

Agency Reports

G. Introduction and Overview of Community Development Block Grant (CDBG) Program (Todd Thorne, CDBG and Revolving Loan Fund Program Manager)

Todd Thorne introduced the Community Development Block Grant Program and the Revolving Loan Fund Program offered to County residents.

Citizens to Be Heard
Grand County Resident Darla Patterson spoke regarding an ongoing issue with her family owned property on San Migil Road, the proposed trail issues and allegations of social media comments made by Council Member Baird.

Discussion Items
H. Calendar Items and Public Notices (KaLeigh Welch, Council Office Coordinator)

General Business- Action Items- Discussion and Consideration of:
I. **Approving Quitclaim Deed to Correct Ownership of Two Parcels of Land in Grand County (Glenna Oliver, Anderson-Oliver Title Insurance Agency)**
MOTION: Motion by Council Member Paxman to approve the Quitclaim Deed to correct ownership of two parcels of land in Grand County and authorize the Chair to sign all associated documents. Motion seconded by Council Member Mary McGann carried 7 – 0.

J. Approving Bid Award for Equipment Purchase of a 4500 Gallon Water Tank for a Truck for the Road Department (Bill Jackson, Road Supervisor)
MOTION: Motion by Council Member Jaylyn Hawks to approve the bid award for the equipment of a 4,500 gallon water tank for a truck for the Road Department from McCandless Truck Center for the bid price of $29,400 and authorize the Chair to sign all associated documents. Motion seconded by Council Member Ken Ballantyne carried 7 – 0.

K. Approving Proposed Terminal Office Lease Agreement with Great Lakes Airlines at Canyonlands Field (Judd Hill, Airport Manager)
MOTION: Motion by Council Member Ken Ballantyne to approve the proposed terminal office lease agreement with Great Lakes Airlines at Canyonlands Field and authorize the Chair to sign all associated documents. Motion seconded by Council Member Rory Paxman carried 7 – 0.

L. Approving Proposed Amendment to the Lease Agreement with Enterprise Rent-A-Car (Judd Hill, Airport Manager)
MOTION: Motion by Council Member Rory Paxman to approve the proposed amendment to the lease agreement with Enterprise Rent-A-Car and authorize the Chair to sign all associated documents. Motion seconded by Council Member Mary McGann carried 7 – 0.

M. Approving Volunteer Appointment to the Noxious Weed Control Board (Council Member Paxman, Council Liaison to the Board)
MOTION: Motion by Council Member Rory Paxman to approve the appointment of Michael Smith to serve on the Noxious Weed Control Board with term expiring 12/31/2017 and authorize the Chair to sign all associated documents. Motion seconded by Council Member Lynn Jackson carried 7 – 0.

N. Approving Contract Award for Professional Fireworks Display on Independence Day (Ruth Dillon, Council Administrator)
MOTION: Motion by Council Member Chris Baird to award the 2015 July 4th professional fireworks contract to Firestorm Pyrotechnics in an amount not to exceed $17,000 and authorize the Chair to sign all associated documents. Motion seconded by Council Member Mary McGann carried 7 – 0. In the future, there will be a grant application presented to the Recreation District.

O. Adopting Proposed Resolution Approving a Conditional Use Permit for T&A RV Park and Storage Located at 1400 Spanish Valley Drive (Mary Hofhine, Development Coordinator, Community Development Department)
MOTION: Motion by Council Member Ken Ballantyne to adopt the proposed resolution approving a conditional Use Permit for T&A RV Park and Storage as submitted and authorize the Chair to sign all associated documents. Motion seconded by Council Member Rory Paxman carried 7- 0.

Consent Agenda- Action Items
P. Approving Proposal for Professional Services for Architect Design Services for Americans with Disabilities Act (ADA) Compliance Alterations for the Courthouse

Q. Approving Proposal for Professional Services for Engineering Services for Americans with Disabilities Act (ADA) Compliance Alterations for the Courthouse

R. Approving Proposed Agreement for Professional Services for Structural Engineering Design Services for Americans with Disabilities Act (ADA) Compliance Alterations for the Courthouse

S. Adopting Proposed Resolution Formalizing the March 31, 2015 Final Vote on the Proposed Public Lands Initiative Recommendation

T. Ratifying the Chair's Signature on a Letter Sent to Congressman Bishop Dated April 9, 2015 Regarding the Final Recommended Designations for Congressman Bishop's Public Lands Initiative

U. Ratifying the Chair's Signature on a Victim of Crime Act (VOCA) Assistance Program Grant Application for the Sheriff's Office

V. Ratifying the Chair's Signature on a Grant Award from the Utah Weed Supervisors Association in the Amount of $5,000.00 for Weed Control Projects During 2015

W. Ratifying the Chair's Signature on a Cooperative Agreement between Grand County and The Nature Conservancy to Address Riparian Area Health Issues along the Dolores River

MOTION: Motion by Council Member Lynn Jackson to remove Item T from the Consent Agenda until the final maps are completed at the next meeting. Motion seconded by Council Member Chris Baird carried 7 – 0.

MOTION: Motion by Council Member Ballantyne to adopt the Consent Agenda. Motion seconded by Council Member Mary McGann carried 7 – 0.

Public Hearings- Possible Action Items

X. Public Hearing to Hear Public Comment Adopting a Proposed Resolution Approving a Rezone Application from General Business (GB) to Small Lot Residential (SLR) for the Housing Authority of Southeastern Utah (HASU) Located at 1518 Murphy Lane (Zacharia Levine, Community Development Director)

Community Development Director Zacharia Levine read into the record the Grand County General Plan and Land Use Code both as amended to date. The application is submitted by Ben Riley, Director of the Housing Authority of Southeastern Utah (HASU, Applicant), seeking a rezone from General Business (GB) to Small Lot Residential (SLR). The area proposed for rezone consists of 1.04 acres of vacant land located at 1518 Murphy Lane.

The Public Hearing was opened at 6:10 p.m.

Judd Hill commented on public safety issues in the valley relating to the future development.

Cathy Bonding a Murphy Lane resident is favor of the rezone.

The comment period will remain open until April 29, 2015 at 5:00 p.m.

Y. Public Hearing to Hear Public Input on Adopting Proposed Ordinance to Abandon Approximately 1000 Feet of Blue Hills (RS2477) Road for Canyonlands Field Airport's Runway Planning in Favor of Realignment (Ruth Dillon, Council Administrator; Judd Hill, Airport Manager and Bill Jackson, Road Supervisor)

Dan Green, Vice-President of Pacific Energy Mining, operators of the Paradox Pipeline, was present via telephone. Information was presented regarding the Blue Hills Road abandonment. Due to public hearing advertising issues, the official public hearing will be held at the next meeting.

General Council Reports and Future Considerations

Council Member McGann reported that the Cemetery Board is operating with a full board. There have been lots of issues and Robert Buckingham was hired as the Sexton.

Council Member Paxman reported that the Chamber of Commerce will no longer be conducting the July 4th Celebration at the park.

Council Member Jackson reported that the proposed movement in rural counties “One County – One Senator” will be discussed at UAC.

Council Member Hawks attended the Housing Task Force and Council on Aging meetings.

Council Member Baird has been working on the Recreation District ILA and Russ von Koch presented a draft congressional act to the Historical Preservation Committee to get the Dewey Bridge rebuilt.

Adjourn
The meeting was adjourned at 7:00 p.m.

Elizabeth Tubbs
Grand County Council Chair

ATTEST:

Diana Carroll, Grand County Clerk/Auditor

GRAND COUNTY **COUNTY COUNCIL MEETING** MAY 5, 2015 Agenda Item: G	
TITLE:	Approving Airport Board Recommendation of a Three-Phase Alternative to Upgrade the Runway in Order to Develop the Airport Layout Plan for the Canyonlands Field Airport Master Plan
FISCAL IMPACT:	N/A
PRESENTER(S):	Judd Hill, Airport Manager and Armstrong Consultants

Prepared By:

Judd Hill
Airport Manager
435-259-4849
jhill@grandcountyutah.net

FOR OFFICE USE ONLY:

Attorney Review:

RECOMMENDATION:

I move to approve the Airport Board recommendation of a three-phase alternative for the runway upgrade in order to develop the Airport Layout Plan for the Canyonlands Field Airport Master Plan, and authorize the Chair to sign all associated documents.

BACKGROUND:

Armstrong Consultants has been developing a new Master Plan and Airport Layout Plan for Canyonlands Field since the Council approved its development in October 2014. A primary component of the Airport Master Plan is to develop an Airport Layout Plan that will describe how the airport's facilities will be changed to accommodate future growth. Currently, our airport's runway is classified as B-II, capable of landing 30 seat turbo-prop commercial airlines. An upgrade to C-II is required to land small (50 seat) commuter jets that the airline industry is currently using. An upgrade to C-III is required to facilitate larger (70-90 seat) commuter jets that are forecast to replace smaller jets in the next 10-15 years.

Armstrong Consultants developed multiple alternatives that could meet the end goal of our airport being rated as C-III. These alternatives included several options to develop a C-II runway and later upgrade to C-III, as well as an alternative to upgrade directly to C-III. The first options enable Moab to be served by commercial jet service in 2-4 years, depending on the plan, while the last option would require maintaining current facilities and service for 6-10 years before being able to be served by commercial jet service.

A technical advisory committee consisting of members of the airport board and the Fixed Base Operator at Canyonlands Field reviewed these different options in meetings that also included the FAA and Utah DOT-Aeronautics division, who will be providing the majority of the funding and must sign off on the plan. The advisory committee recommendations were presented and discussed with the public at the airport board's March 2015 meeting. At the conclusion of that meeting, the Board voted to recommend the County Council approve a three-phase plan that incorporated parts of several alternatives to upgrade the airport's runway to C-II as fast as possible, and later to C-III.

The first phase would replace the existing runway with one that is stronger and wider, but technically shorter; this construction would result an upgrade to C-II classification. In response to public comments, the airport would proceed with this construction during the winter months of 2016-2017 to minimize impacts on the businesses at the airport. During this time, the county will also improve

a portion of the unpaved area on the airport to serve as a temporary landing surface since the runway will be dosed. The next two phases of the proposed upgrade would occur in subsequent years. The second phase would lengthen the runway, back to the original 7100'. The third phase would move the taxiway away from the runway to meet the requirements of the C-III classification.

The delay from the Airport Board's vote to presentation to the Council was due to work being done by the County, Armstrong Consultants, and UDOT-Aeronautics to petition the FAA to waive a newly implemented rule that would have required moving HWY 191 and the railroad tracks approximately ¼ mile to the north. Notice of this waiver was received on 04/29/2015.

The final Airport Master Plan and Airport Layout Plans will be generated based on this agenda item's recommendation, and presented to the Council for approval later this year.

ATTACHMENT(S):
Three proposed phases of development

APPENDIX F

ACRONYMS

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

COMMONLY USED ACRONYMS

AC	Advisory Circular
AD	Airport Design
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ALS	Approach Lighting System
ARC	Airport Reference Code
ARP	Airport Reference Point
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate Stop Distance
ASR	Airport Surveillance Radar
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
AWOS	Automated Weather Observation system
BRL	Building Restriction Line
CAT	Category
CFR	Code of Federal Regulations
CWY	Clearway
CY	Calendar Year
DME	Distance Measuring Equipment
EL	Elevation
EMT	Emergency Medical Technician
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FSS	Flight Service System
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
HIRL	High Intensity Runway Lights
IEMT	Intermediate Emergency Medical Technician
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Landing Distance Available
LOC	Localizer
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashers
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
ME	Multi-Engine
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MLS	Microwave Landing System
MOA	Military Operating Area
MSL	Mean Sea Level
NAVAID	Navigational Aid
NDB	Nondirectional Beacon
NM	Nautical Mile
NPIAS	National Plan of Integrated Airport Systems
ODALS	Onmnidirectional Approach Lighting System
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
RAIL	Runway Alignment Indicator Lights
RDC	Runway Design Code
REIL	Runway End Identifier Lights
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range
RW	Runway
SWY	Stopway
TDG	Taxiway Design Group
TH	Threshold
TL	Taxilane
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available
TSA	Taxiway Safety Area
TVOR	Very High Frequency Omni range on an Airport
TW	Taxiway
USGS	United States Geological Society
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VOR	Very High Frequency Omni range

APPENDIX G

GLOSSARY OF TERMS

CANYONLANDS FIELD
AIRPORT MASTER PLAN

ARMSTRONG

GLOSSARY OF TERMS

Above Ground Level (AGL)	A height above ground as opposed to MSL (height above Mean Sea Level).
Advisory Circular (AC)	Publications issued by the FAA to provide a systematic means of providing non-regulator guidance and information in a variety of subject areas.
Airport Improvement Program (AIP)	The AIP of the Airport and Airways Improvement Act of 1982 as amended. Under this program, the FAA provides funding assistance for the design and development of airports and airport facilities.
Aircraft Mix	The number of aircraft movements categorized by capacity group or operational group and specified as a percentage of the total aircraft movements.
Aircraft Operation	An aircraft takeoff or landing.
Airport	An area of land or water used or intended to be used for landing and takeoff of aircraft includes buildings and facilities, if any.
Airport Elevation	The highest point of an airport's useable runways, measured in feet above mean sea level.
Airport Land Use Regulations	Are designed to preserve existing and/or establish new compatible land uses around airports, to allow land use not associated with high population concentration, to minimize exposure of residential uses to critical aircraft noise areas, to avoid danger from aircraft crashes, to discourage traffic congestion and encourage compatibility with non-motorized traffic from development around airports, to discourage expansion of demand for governmental services beyond reasonable capacity to provide services and regulate the area around the airport to minimize danger to public health, safety, or property from the operation of the airport, to prevent obstruction to air navigation and to aid in realizing the policies of a County Comprehensive Plan and Airport Master Plan.
Airport Layout Plan (ALP)	A graphic presentation, to scale, of existing and proposed airport facilities, their location on the airport and the pertinent applicable standards. To be eligible for AIP funding assistance, an airport must have an FAA-approved ALP.
Airport Master Record, Form 5010	The official FAA document, which lists basic airport data for reference and inspection purposes.
Airport Reference Code (ARC)	The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport.

Airport Reference Point (ARP)	The latitude and longitude of the approximate center of the airport.
Airspace	Space above the ground in which aircraft travel; divided into corridors, routes and restricted zones.
Air Traffic	Aircraft operating in the air or on an airport surface, excluding loading ramps and parking areas.
Approach Surface	A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.
Automated Weather Observing System (AWOS)	This equipment automatically gathers weather data from various locations on the airport and transmits the information directly to pilots by means of computer generated voice messages over a discrete frequency.
Based aircraft	An aircraft permanently stationed at an airport.
Building Restriction Line (BRL)	A line, which identifies suitable building area locations on airports.
Ceiling	The height above the earth's surface of the lowest layer of clouds or other phenomena which obscure vision.
Conical Surfaces	A surface extending outward and upward form the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
Controlled Airspace	Airspace in which some or all aircraft may be subject to air traffic control to promote safe and expeditious flow of air traffic.
Critical/Design Aircraft	In airport design, the aircraft which controls one or more design items such as runway length, pavement strength, lateral separation, etc., for a particular airport. The same aircraft need not be critical for all design items.
Day Night Level (DNL)	24-hour average sound level, including a 10 decibel penalty for sound occurring between 10:00 PM and 7:00 AM.
Decibel	Measuring unit for sound based on the pressure level.
Design Type	The design type classification for an airport refers to the type of runway that the airport has based upon runway dimensions and pavement strength.
Federal Aviation Administration (FAA)	The federal agency responsible for the safety and efficiency of the national airspace and air transportation system.
FAR Part 77	A definition of the protected airspace required for the safe navigation of aircraft.

Fixed Base Operator (FBO)	An individual or company located at an airport and providing commercial general aviation services.
Fuel Flowage Fees	A fee charged by the airport owner based upon the gallons of fuel either delivered to the airport or pump at the airport.
General Aviation (GA)	All aviation activity in the United States, which is neither military nor conducted by major, national or regional airlines.
Glider	A heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its lifting surfaces and whose free flight does not depend principally on an engine (FAR Part 1).
Global Positioning System (GPS)	The global positioning system is a space based navigation system, which has the capability to provide highly accurate three-dimensional position, velocity and time to an infinite number of equipped users anywhere on or near the Earth. The typical GPS integrated system will provide: position, velocity, time, altitude, groundspeed and ground track error, heading and variation. The GPS measures distance, which it uses to fix position, by timing a radio signal that starts at the satellite and ends at the GPS receiver. The signal carries with it, data that discloses satellite position and time of transmission and synchronizes the aircraft GPS system with satellite clocks.
Hazard to Air Navigation	An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities or existing or potential airport capacity.
Horizontal Surface	A horizontal plane 150 feet above the established airport elevation, the perimeter which is constructed by swinging arcs of specified radii form the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.
Imaginary Surfaces	Surfaces established in relation to the end of each runway or designated takeoff and landing areas, as defined in paragraphs 77.25, 77.28 and 77.29 of FAR Part 77, *Objects Affecting Navigable Airspace*. Such surfaces include the approach, horizontal, conical, transitional, primary and othersurfaces.
Itinerant Operations	All operations at an airport, which are not local operations.
Jet Noise	The noise generated externally to a jet engine in the turbulent jet exhaust.
Knots	Nautical miles per hour, equal 1.15 statute miles per hour.
Large Airplane	An airplane of more than 12,500 pounds maximum certified takeoff weight.

Local Operations	Operations by aircraft flying in the traffic pattern or within sight of the control tower, aircraft known to be arriving or departing from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.
Location Identifier	A three-letter or other code, suggesting where practicable, the location name that it represents.
Maneuvering Area	That part of an airport to be used for the takeoff and landing of aircraft and for the movement of aircraft associated with takeoff and landing, excluding aprons.
Master Plan	A planning document prepared for an airport, which outlines directions and developments in detail for 5 years and less specifically for 20 years. The primary component of which is the Airport Layout Plan.
Mean/Maximum Temperature	The average of all the maximum temperatures usually for a given period of time.
Mean Sea Level (MSL)	Height above sea level.
Medium Intensity Runway Lights (MIRL)	For use on VFR runways or runway showing a nonprecision instrument flight rule (IFR) procedure for either circling or straight-in approach.
Minimum Altitude	That designated altitude below which an IFR pilot is not allowed to fly unless arriving or departing an airport or for specific allowable flight operations.
National Airspace System	The common network of United States airspace, navigation aids, communications facilities and equipment, air traffic control equipment and facilities, aeronautical charts and information, rules, regulations, procedures, technical information and FAA manpower and material.
National Plan of Integrated Airport Systems (NPIAS)	A plan prepared annually by the FAA which identifies, for the public, the composition of a national system of airports together with the airport development necessary to anticipate and meet the present and future needs of civil aeronautics, to meet requirements in support of the national defense and to meet the special needs of the Postal Service. The plan includes both new and qualitative improvements to existing airports to increase their capacity, safety, technological capability, etc.
NAVAID	A ground based visual or electronic device used to provide course or altitude information to pilots.
Noise	Defined subjectively as unwanted sound. The measurement of noise involves understanding three characteristics of sound: intensity, frequency and duration.
Noise Contours	Lines drawn about a noise source indicating constant energy levels of noise exposure. DNL is the measure used to describe community exposure to noise.

Noise Exposure Level	The integrated value, over a given period of time of a number of different events of equal or different noise levels and durations.
Non-Precision Instrument	A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance for which a straight-in nonprecision instrument approach procedure has been approved.
Notice to Airmen (NOTAM)	A notice containing information (not known sufficiently in advance to publicize by other means concerning the establishment, condition or change in any component (facility, service, or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.
Object	Includes, but is not limited to, above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain and parked aircraft.
Object Free Area (OFA)	A two-dimensional ground area-surrounding runways, taxiways and taxilanes which is clear of objects except for object whose location is fixed by function.
Obstacle Free Zone (OFZ)	The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.
Obstruction	An object which penetrates an imaginary surface described in the FAA's Federal Aviation Regulations (FAR), Part 77.
Parking Apron	An apron intended to accommodate parked aircraft.
Pattern	The configuration or form of a flight path flown by an aircraft or prescribed to be flown, as in making an approach to a landing.
Precision Approach Path Indicators (PAPI)	The visual approach slope indicator system furnishes the pilot visual slope information to provide safe descent guidance. It provides vertical visual guidance to aircraft during approach and landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that they are "on path" if they see red/white, "above path" if they see white/white and "below path" if they see red/red.
Primary Surface	A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway, but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway.
Rotating Beacon	A visual navaid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport.
Runway	A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.

Runway Design Code (RDC)	A code signifying the design standards to which the runway is to be built.
Runway End Identifier Lights (REIL)	REILs are flashing strobe lights which aid the pilot in identifying the runway end at night or in bad weather conditions.
Runway Gradient	The average gradient consisting of the difference in elevation of the two ends of the runway divided by the runway length may be used provided that no intervening point on the runway profile lies more than five feet above or below a straight line joining the two ends of the runway. In excess of five feet the runway profile will be segmented and aircraft data will be applied for each segment separately.
Runway Lighting System	A system of lights running the length of a system that may be either high intensity (HIRL), medium intensity (MIRL), or low intensity (LIRL).
Runway Orientation	The magnetic bearing of the centerline of the runway.
Runway Protection Zone (RPZ)	An area off the runway end used to enhance the protection of people and property on the ground.
Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion form the runway.
Segmented Circle	A basic marking device used to aid pilots in locating airports and which provides a central location for such indicators and signal devices as may be required.
Small Aircraft	An airplane of 12,500 pounds or less maximum certified takeoff weight.
Taxiway	A defined path established for the taxiing of aircraft from one part of an airport to another.
Taxiway Design Group (TDG)	A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG).
Terminal Area	The area used or intended to be used for such facilities as terminal and cargo buildings, gates, hangars, shops and other service buildings, automobile parking, airport motels, restaurants, garages and automobile services and a specific geographical area within which control of air traffic is exercised.
Threshold	The beginning of that portion of the runway available for landing.
Touch and Go Operations	Practice flight performed by a landing touchdown and continuous takeoff without stopping.
Traffic Pattern	The traffic flow that is prescribed for aircraft landing at, taxiing on or taking off form an airport. The usual components are the departure, crosswind, downwind, and base legs; and the final approach.

Transitional Surface	These surfaces extend outward and upward at right angles to runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.
Universal Communications (UNICOM)	A private aeronautical advisory communications facility for purpose other than air traffic control. Only one such station is authorized in any landing area. Service available are advisory in nature primarily concerning the airport services and airport utilization. Locations and frequencies of UNICOMs are listed on aeronautical charts and publications.
Visual Flight Rules (VFR)	Rules that govern flight procedures under visual conditions.
Visual Runway	A runway intended for visual approaches only with no straight- in instrument approach procedure either existing or planned for that runway.

OUR BUSINESS IS AVIATION. OUR PRIORITY IS YOU.

Corporate Office
861 Rood Avenue
Grand Junction, Colorado 81501
970.242.0101

Denver Office
6855 South Havana Street, Suite 400
Centennial, Colorado 80112
303.296.4949

Albuquerque Office
2305 Renard Place SE, Suite 210
Albuquerque, New Mexico 87106
505.508.2192

Phoenix Office
2345 S. Alma School Road, Suite 208
Mesa, Arizona 85210
602.803.7079

www.armstrongconsultants.com