Federal Airways & Airspace®

Aeronautical Impact Statement (AIS)

Document No.: 2018-AIS-1420-OE
Site: Southeast Power Link 230 kV

Prepared for: Salt River Project
Date: 25 July 2018

Summary of Findings

The potential impacts of the proposed transmission line located near the Phoenix-Mesa Gateway Airport (IWA) are as follows:

- **Part 77.9(b) FAA Notice:** All proposed transmission line structures will exceed the Part 77.9(b) Notice slope requirement. Notice to the FAA is required for the proposed structures.

- **Part 77 Obstruction Surfaces:** The Part 77 Obstruction Standards are used to determine if an object is considered an obstruction to air navigation. None of the Part 77.19 Imaginary Obstruction Surfaces will be penetrated by the proposed transmission line. Part 77.17(a)(3), Obstruction Standard, states that exceeding a TERPS surface would classify an object as an obstruction. By penetrating the IWA Runway 30C VNAV, as discussed below, the proposed project becomes an obstruction under Part 77.17(a)(3). However, this procedure will hopefully be redesigned by the FAA because of the proposed project. Once this has been completed, the project will no longer be exceeding any of the Part 77 Obstruction Criteria. Marking & Lighting of the transmission line is not expected. However, the FAA could request it due to the proximity to the airport.

- **IWA Runway 30C VNAV Approach:** The VNAV Instrument Approach Procedure (IAP) is utilized by pilots landing on Runway 30C at IWA. Thirty-Four (34) structures along SR24 and Crismon Rd will exceed the lowest maximum allowable height of 1469 feet AMSL within the Final Segment or Missed Approach Segment. Pilots landing on IWA Runway 30C have 6 different types of IAPs available to them, two of which provide better approach minimums than the VNAV procedure and would be the preferred approaches in to Runway 30C. It is our understanding that the City of Mesa, who own 51% of the IWA airport, supports this project and ultimately supports the redesign of the Runway 30C VNAV Approach Procedure to allow this project to continue.

- **EMI Summary:** Forty-Eight (48) structures will exceed the ASR Radar Equation Screening Criteria. These structures may adversely affect the IWA ASR at their current heights and would likely receive Notices of Presumed Hazard upon completion of the initial FAA study. These should be lowered to the heights found in the supplemental Excel Sheet if a quick approval of the transmission line is desired. The Airport Layout Plan has indicated that the ASR-9 will be relocated in the future when IWA begins expansion of their terminal areas. The impact to the ASR should not be a factor once this move has been completed. Additionally, there is significant shielding of the IWA ASR already occurring due to the extreme changes in terrain within the 60NM operational range of the ASR. It is likely that the proposed transmission line will not add a significant amount of shielding effect to the ASR.

  FA&A has identified the potential for ASR shielding and false targets for numerous structures within the proposed transmission line project. Due to the surrounding environment and multitude of terrain features within 20NM of the IWA ASR, FA&A believes that there will be minimal impact to the IWA ASR.

This **Aeronautical Impact Statement** (AIS) was prepared by Federal Airways & Airspace (FA&A) for Salt River Project on July 25, 2018.

2018-AIS-1420-OE identifies potential aeronautical conflicts with Phoenix-Mesa Gateway Airport (IWA) caused by the installation of (74) proposed transmission line structures.

Notice and Obstruction Criteria established by Title 14 CFR Part 77, *Safe, Efficient Use of the Navigable Airspace* were applied[1].

This Aeronautical Impact Statement provides a baseline study establishing the relationship between the National Airspace System (NAS) [2] and the proposed transmission line.

Changes to structure height and configuration, coordinates, and the aeronautical environment will warrant a Revision to Document 2018-AIS-1420-OE.

The National Airspace System (NAS) is a dynamic and intricate network of invisible aeronautical surfaces, navigational facilities and landing facilities and is subject to constant revision. Aeronautical datasets are updated regularly at 28 and 56-day intervals. At a minimum, all Aeronautical Impact Statements should be updated annually. The aeronautical environment is also subject to change at any given time as the direct result of new data regarding existing structures and structures for which FAA Form 7460-2, *Notice of Actual Construction or Alteration*, have been filed. Alterations to the aeronautical environment cannot be anticipated. It is recommended that 2018-AIS-1420-OE be reviewed and a revision published prior to filing FAA Form 7460-1 if more than 56 days elapse between the date of this report and the date that these forms are submitted to the FAA.

The Background Summary of the Final Rule for Title 14 CFR Part 77 states that the FAA is now applying an expanded range of Notice Criteria, and that the FAA web site https://oeaaa.faa.gov must be consulted to determine notice requirements for structures near all airports listed on the web site. Because the web site performs its calculations using the FAA's Digital Obstacle File (DOF) and OE/AAA Automated System Airport Runway Database, both of which are documented to contain errors and omissions, it is not advisable to consult the FAA website to determine notice requirements. This AIS was compiled using FA&A's Airspace and TERPS software, which are supported by independent, proprietary obstacle and airport/runway databases in addition to FAA administrated airport/runway data.

[1] Title 14 Code of Federal Regulations Federal Aviation Regulation Part 77, *Safe, Efficient Use of the Navigable Airspace*, was published in the Federal Register on 21 July 2010 and became effective 18 January 2011.
[1] Aeronautical Data updates are published every 56 days.

Table of Contents

Parameters and Assumptions

The proposed transmission line will be analyzed to determine the aeronautical impact to the Phoenix-Mesa Gateway Airport (IWA) located in Mesa, Arizona.

Project Statistics

There are 3 public-use, and 8 private-use landing facilities within approximately 10 Nautical Miles of the proposed transmission structures. Additionally, there are 7 public-use Instrument Approach Procedure Charts currently in use at Phoenix-Mesa Gateway Airport (IWA) that will require analysis.

Aeronautical Impact Analysis

The following will be reviewed for the public-use airports:

- Federal Notice Criteria limits over property
- Obstacle Criteria height limits over property
- Near airport surfaces
- VFR Traffic Pattern limits
- TERPS/Instrument Approach Procedures

En Route Airways, Minimum Safe Altitude (MSA) and Minimum Vector Altitude (MVA) will also be assessed.

Each private-use airport will be investigated for special/private instrument procedures that are protected by the FAA and would impose height restrictions upon the Proposed Transmission Structures.

Lastly, impact of the Proposed Transmission Structures to NEXRAD Weather Radar, Air Route Surveillance Radar (ARSR), Airport Surveillance Radar (ASR), Military Operations Areas (MOA) and potential impacts to other air navigation facilities will be reviewed.

Aeronautical Environment

The Southeast Power Link 230 kV Transmission Line Project was analyzed to determine the aeronautical impact, if any, at each of (74) structure locations.

Private Landing Facilities

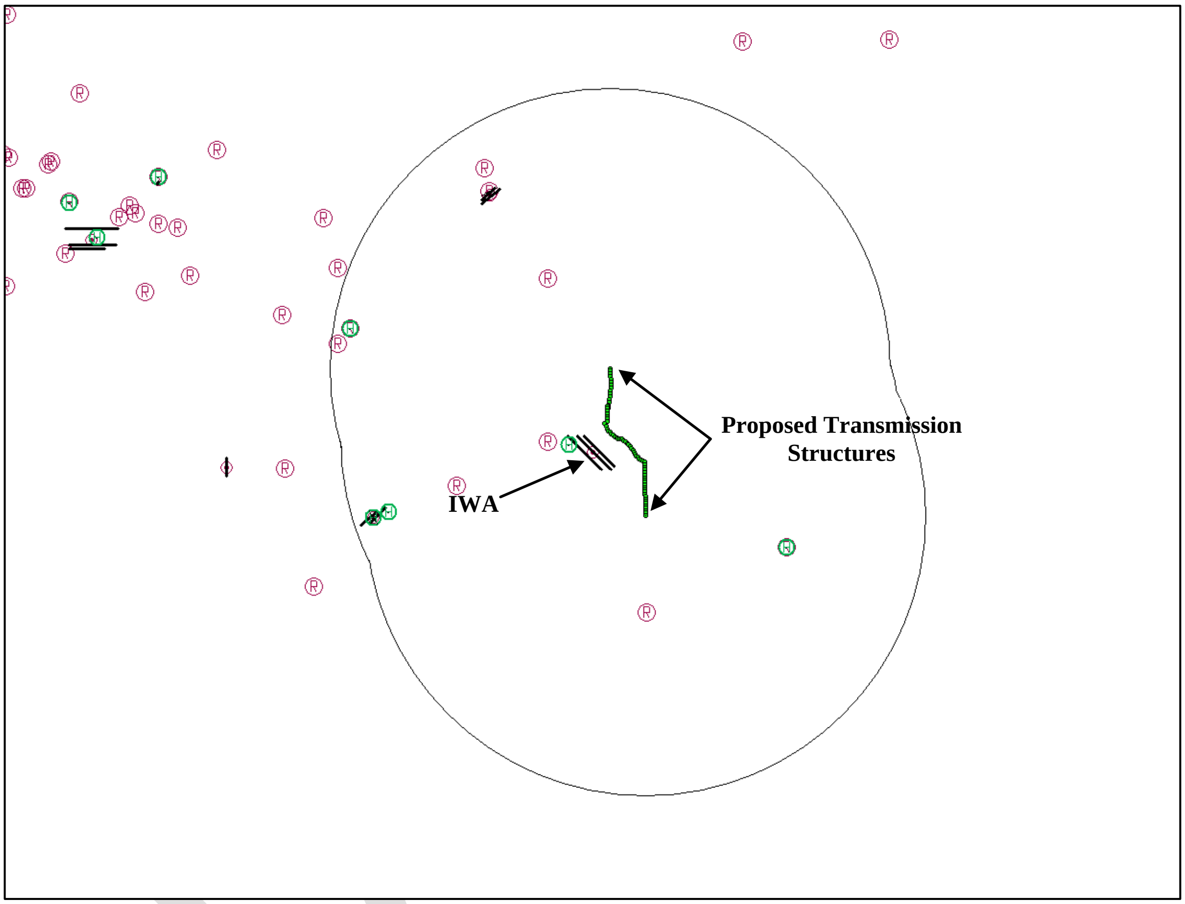


Figure 1: Private Landing Facilities within 10 NM of Proposed Transmission Structures as labeled

There are 9 Private Landing Facilities located within 10 NM of the Proposed Transmission Structures. The proposed transmission structures will have no effect upon nearby private landing facilities. None of these private landing facilities have special/private instrument procedures associated with them.

Public Landing Facilities

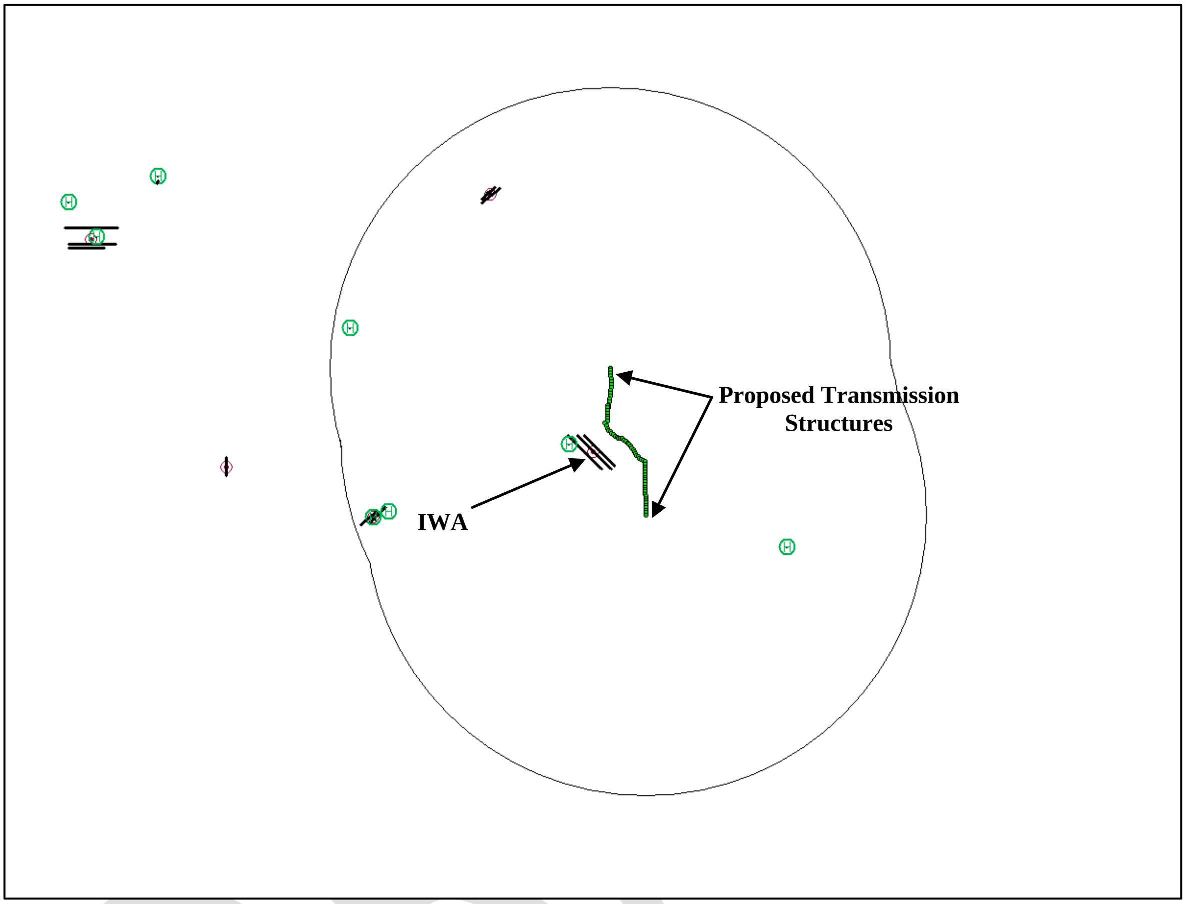


Figure 2: Public Landing Facilities within 10 NM of Proposed Transmission Structures as labeled

There are 4 Public Landing Facilities located within 10 NM of the proposed transmission structures as labeled in Figure 2. Phoenix-Mesa Gateway Airport (IWA), Chandler Municipal Airport (CHD), & Falcon Field (FFZ) have IFR Procedures associated with them as of the date of this document. The proposed transmission structures may impact the IFR procedures at IWA.

IFR Notice Criteria

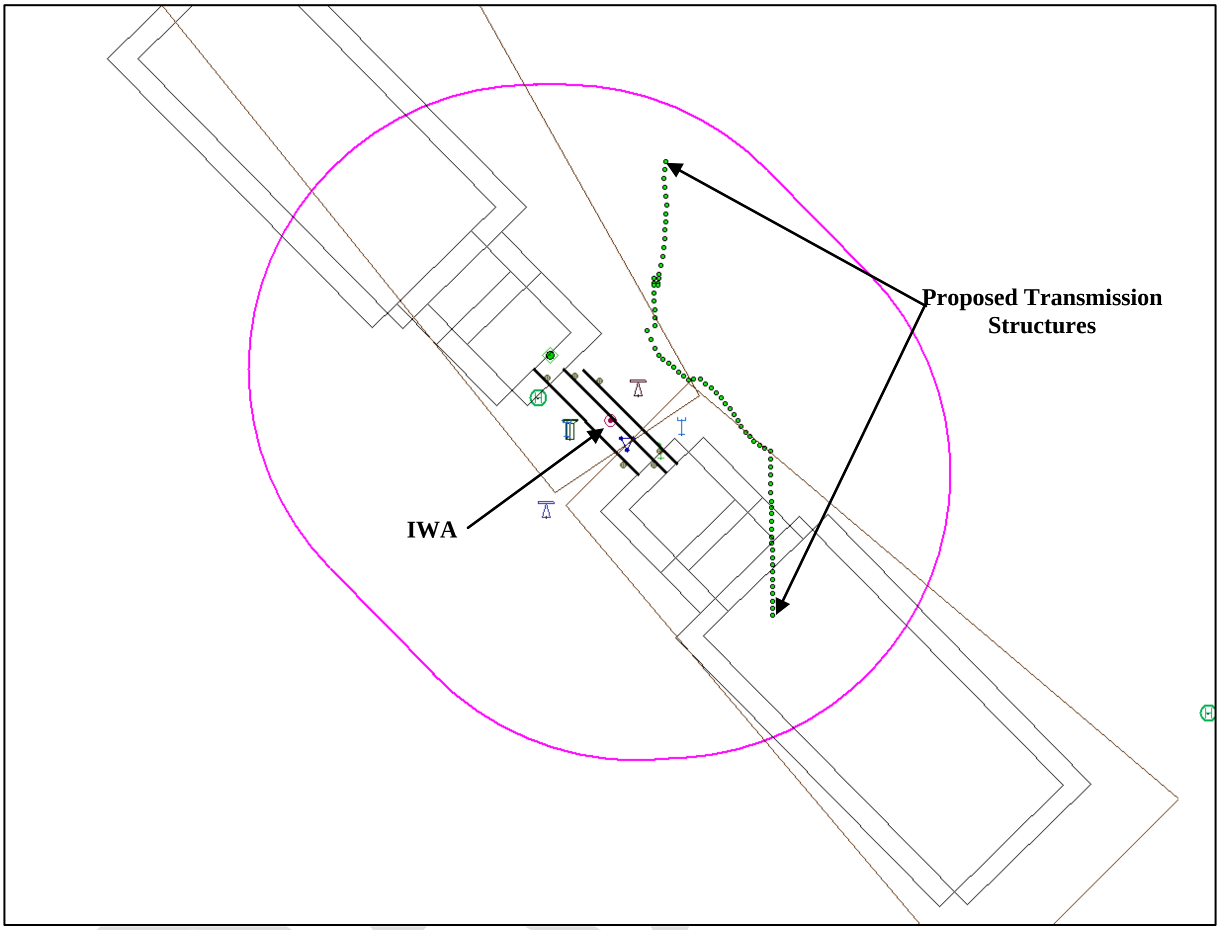


Figure 3: IFR Notice Criteria for Phoenix-Mesa Gateway Airport (IWA)

The IFR notice criteria area for Phoenix-Mesa Gateway Airport (IWA) is depicted in Figure 3. CFR Title 14 Part 77.9(b), dictates that notice is required for any construction or alteration that exceeds an imaginary surface extending outward and upward at a slope of 100 to 1 for any horizontal distance of 20,000 feet from the nearest point of the nearest runway of a public use instrument procedure airport with its longest runway more than 3,200 feet AMSL. The pink outlined circle depicts the 77.9(b) requirement. Locating within the pink outlined area or within the outlined procedure areas will likely require notice to the FAA.

All proposed transmission structures exceed the Part 77.9(b) notice slope, thus requiring Notice to the FAA at least 45 business days prior to the start of construction. Please see the attached Airspace Point Study Excel Sheet for specific structure information.

Title 14 CFR Part 77 Surfaces

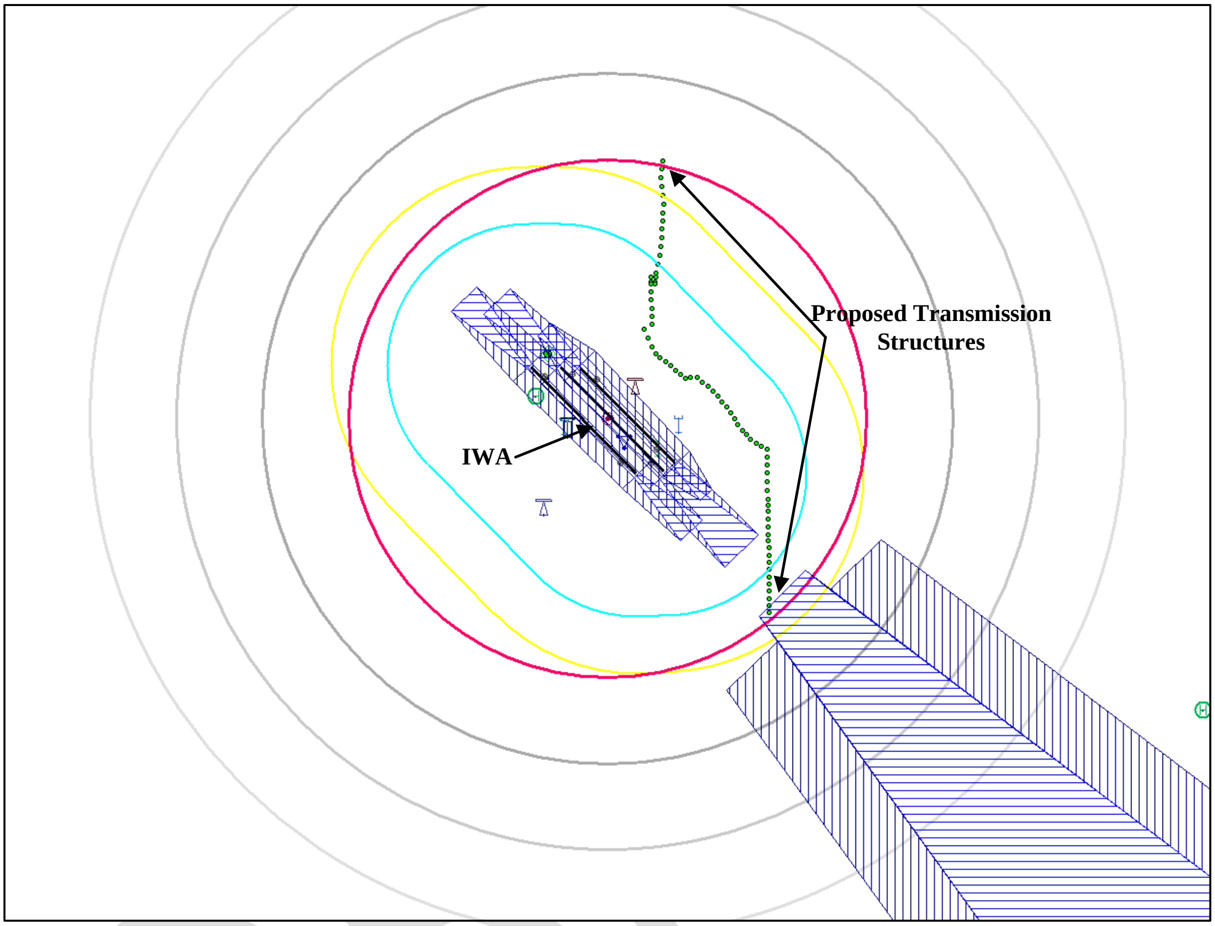


Figure 4: Phoenix-Mesa Gateway Airport (IWA) Part 77 Surfaces surrounding the proposed transmission structures.

The Title 14 CFR Part 77.17(a) (2) Visual Flight Rule (VFR) Transitional Surfaces are represented by the four sets of concentric rings surrounding airports that have at least one runway exceeding 3,200 feet in length. The VFR Transitional Surface begins 200 feet above the ground elevation of the Airport Reference Point (ARP) for each corresponding airport, extends for a radius of 3 NM, and then increases at a slope of 100 feet per nautical mile, ending 5.99 NM from the ARP.

The 77.19(a) (2) IFR Horizontal Surface and Conical Surface are shown, represented by the cyan and yellow circles surrounding the airports.

The 77.19(c), (d), & (e) Approach Obstacle Surfaces are shown, represented by the blue lined areas.

Part 77 Obstruction Surfaces

77.17(a) (2) - VFR Transitional Surface

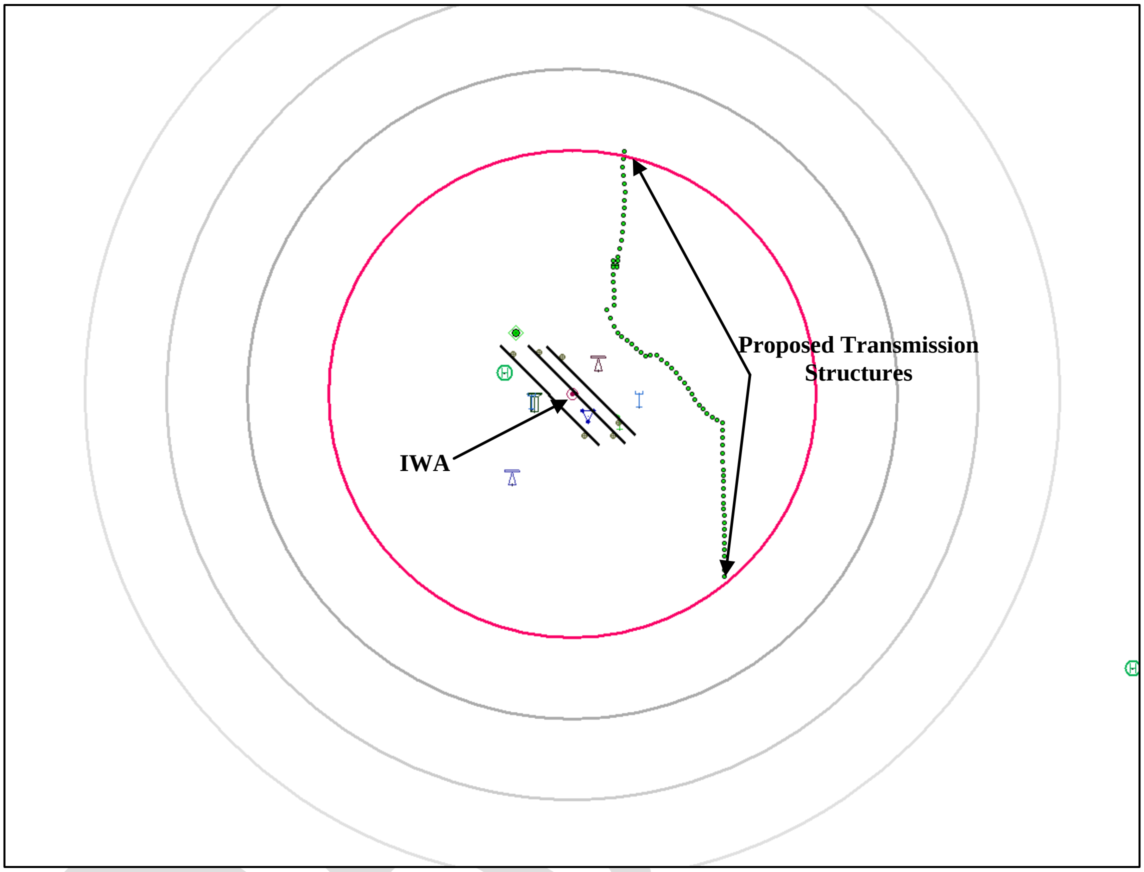


Figure 5: VFR Transitional Surface at IWA

The Phoenix-Mesa Gateway Airport (IWA) Part 77.17(a) (2) VFR Transitional Surface is a surface which extends 5.99 NM from the Airport Reference Points (ARP). The VFR Transitional Surface maximum allowable height starts at 200 feet above the ARP or ground elevation, whichever is greater. Each grey circle beyond the red circle represents an increase to this height of 100 feet AMSL. The maximum allowable height over the proposed transmission line ranges from 1583 feet AMSL to 1614 feet AMSL. The typical mitigation to penetration of this surface is use of obstruction lighting on the structure. However, the proposed transmission structures will have no effect upon the VFR Transitional Surface as their AGL height does not exceed 200 feet AGL.

FAR 77.19(a) and (b) IFR Horizontal and Conical Surfaces

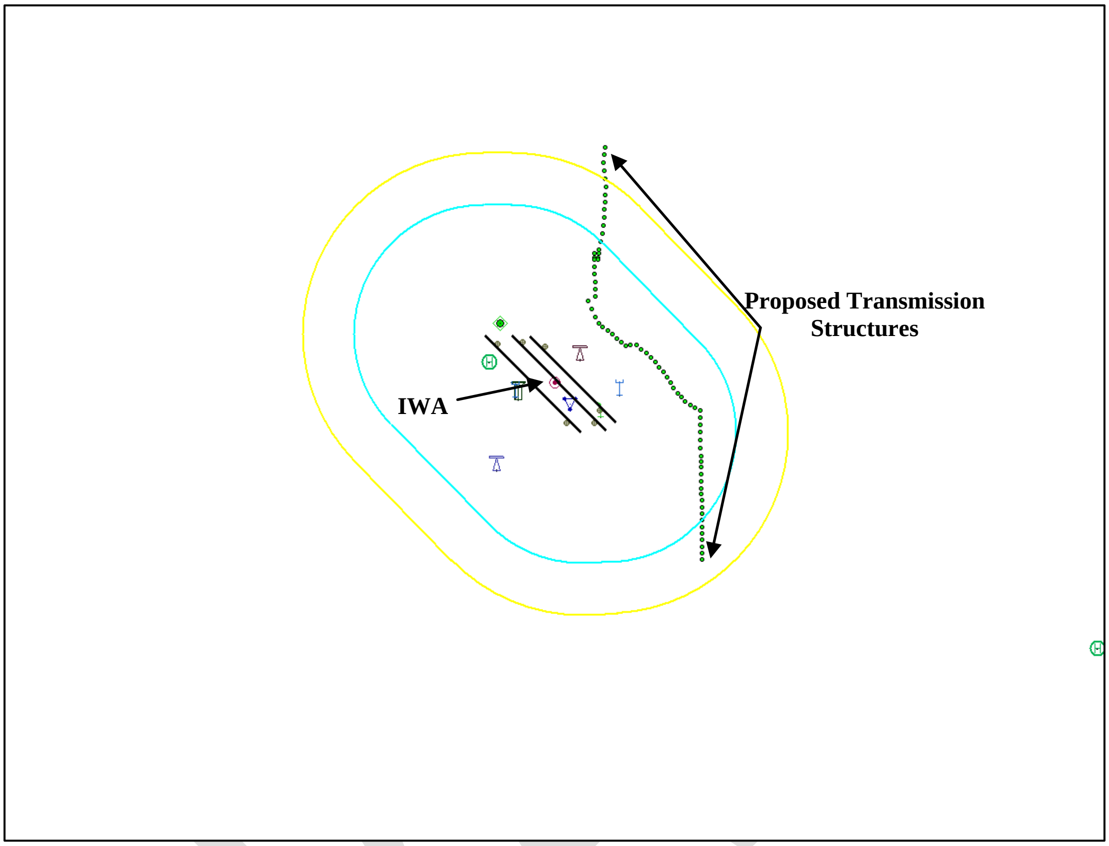


Figure 6: IFR Horizontal and Conical Surfaces at IWA

The Phoenix-Mesa Gateway Airport (IWA) Part 77.19(a) Horizontal Surface, highlighted in cyan, is a flat surface that starts 200 feet off the end of each runway then extends outward for 10,000 feet. Part 77.19(b) Conical Surface, highlighted in yellow, is a 20:1 sloping surface that begins as the end of the Horizontal Surface and extends outward and upward for 4,000 feet.

The maximum allowable height within the IWA IFR Horizontal surface is 1533 feet AMSL. The proposed transmission structures will have no effect upon the IWA IFR Horizontal surface.

The maximum allowable height within the IWA IFR Conical Surface ranges from 1533 feet AMSL to 1713 feet AMSL. The proposed transmission structures will have no effect upon the IWA IFR Conical surface.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

FAR 77.19(a) and (b) VFR Horizontal and Conical Surfaces

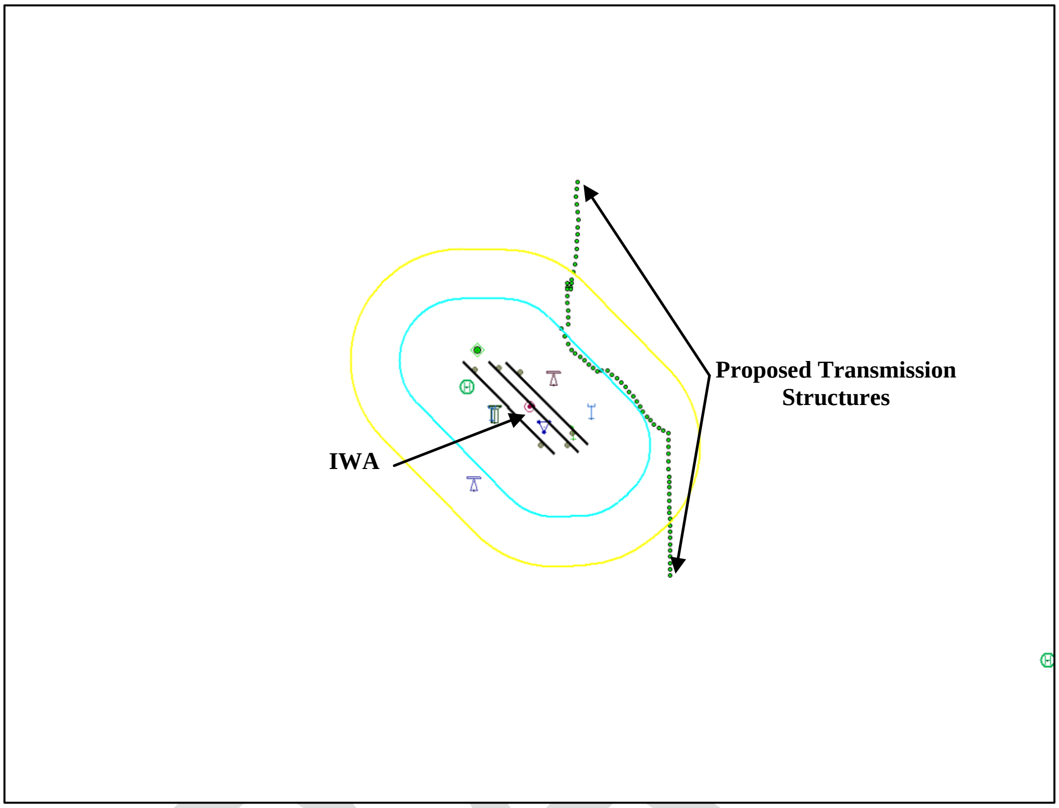


Figure 7: VFR Horizontal and Conical Surfaces at IWA

The Phoenix-Mesa Gateway Airport (IWA) Part 77.19(a) VFR Horizontal Surface, highlighted in cyan, is a flat surface that starts 200 feet off the end of each runway then extends outward for 5,000 feet. Part 77.19(b) VFR Conical Surface, highlighted in yellow, is a 20:1 sloping surface that begins at the end of the VFR Horizontal Surface and extends outward and upward for 4,000 feet.

The maximum allowable height within the IWA VFR Horizontal surface is 1533 feet AMSL. The proposed transmission structures will have no effect upon the IWA VFR Horizontal surface.

The maximum allowable height within the IWA VFR Conical Surface ranges from 1533 feet AMSL to 1731 feet AMSL. The proposed transmission structures will have no effect upon the IWA VFR Conical surface.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA Approach Surface

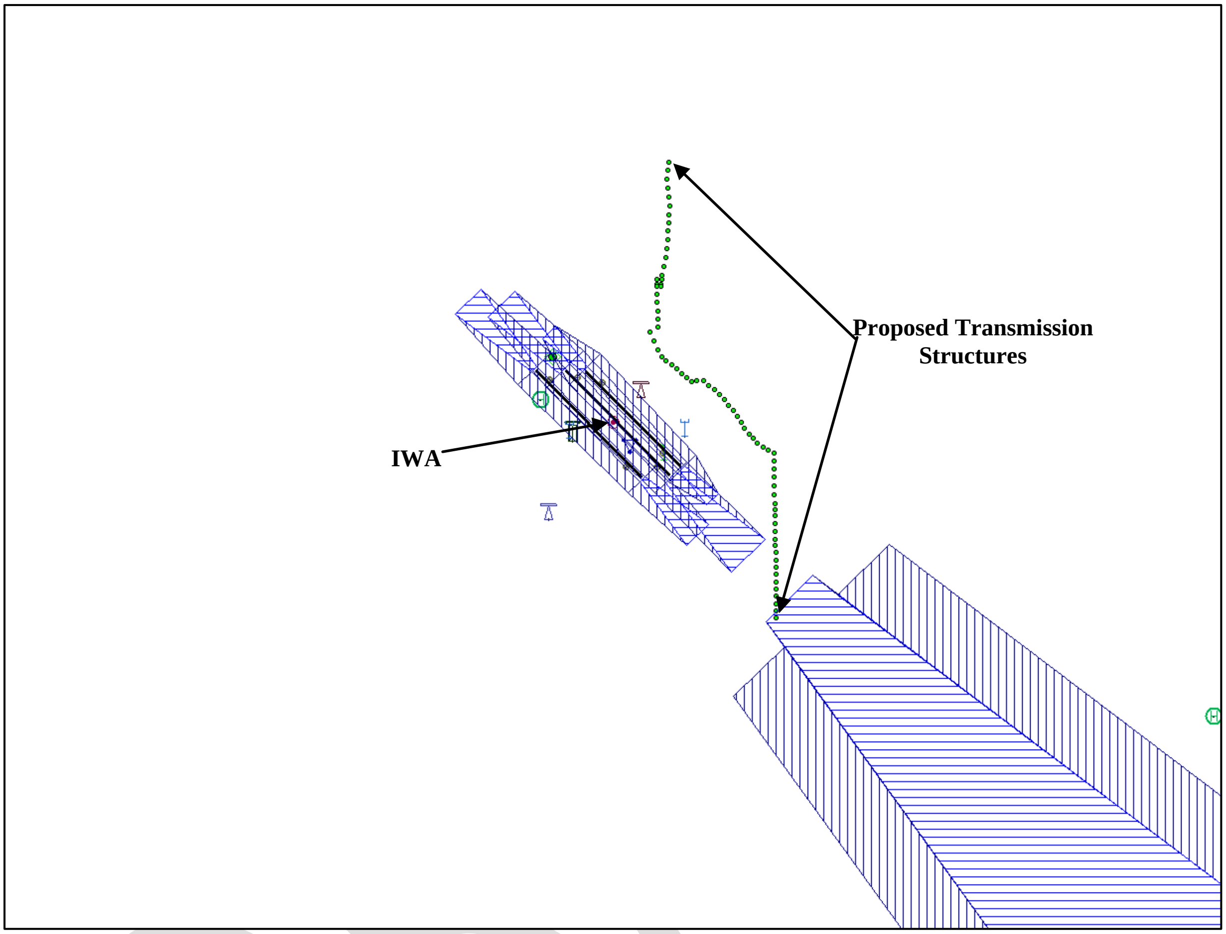


Figure 8: Phoenix-Mesa Gateway Airport (IWA) Approach Surfaces

The Approach Obstacle Surfaces (AOS) at the Phoenix-Mesa Gateway Airport (IWA) are denoted by the blue hashed areas. The IWA RWY 30C Approach Surface is a 50:1 sloping surface which begins 200 feet from the runway end then extends 10,000 feet. At this point it becomes a 40:1 sloping surface and extends for an additional 40,000 feet. The IWA RWY 12L/30R Approach Surfaces are a 20:1 sloping surface which begins 200 feet from the runway end, then extends 5,000 feet. The maximum allowable heights within the AOS for IWA range from 1556 feet AMSL to 1601 feet AMSL.

None of the proposed transmission structures will penetrate the 50:1 Approach Obstacle Surfaces for RWY 30C IWA. The typical mitigation for penetrating the 50:1 approach surface is obstruction marking and lighting of the structures provided there are already penetrations of the visibility minimums on the IAP charts are larger than ¾ mile

The maximum allowable height to avoid penetrating these surfaces can be found in the attached Airspace Point Study Excel Sheet.

IWA VFR Traffic Pattern Airspace

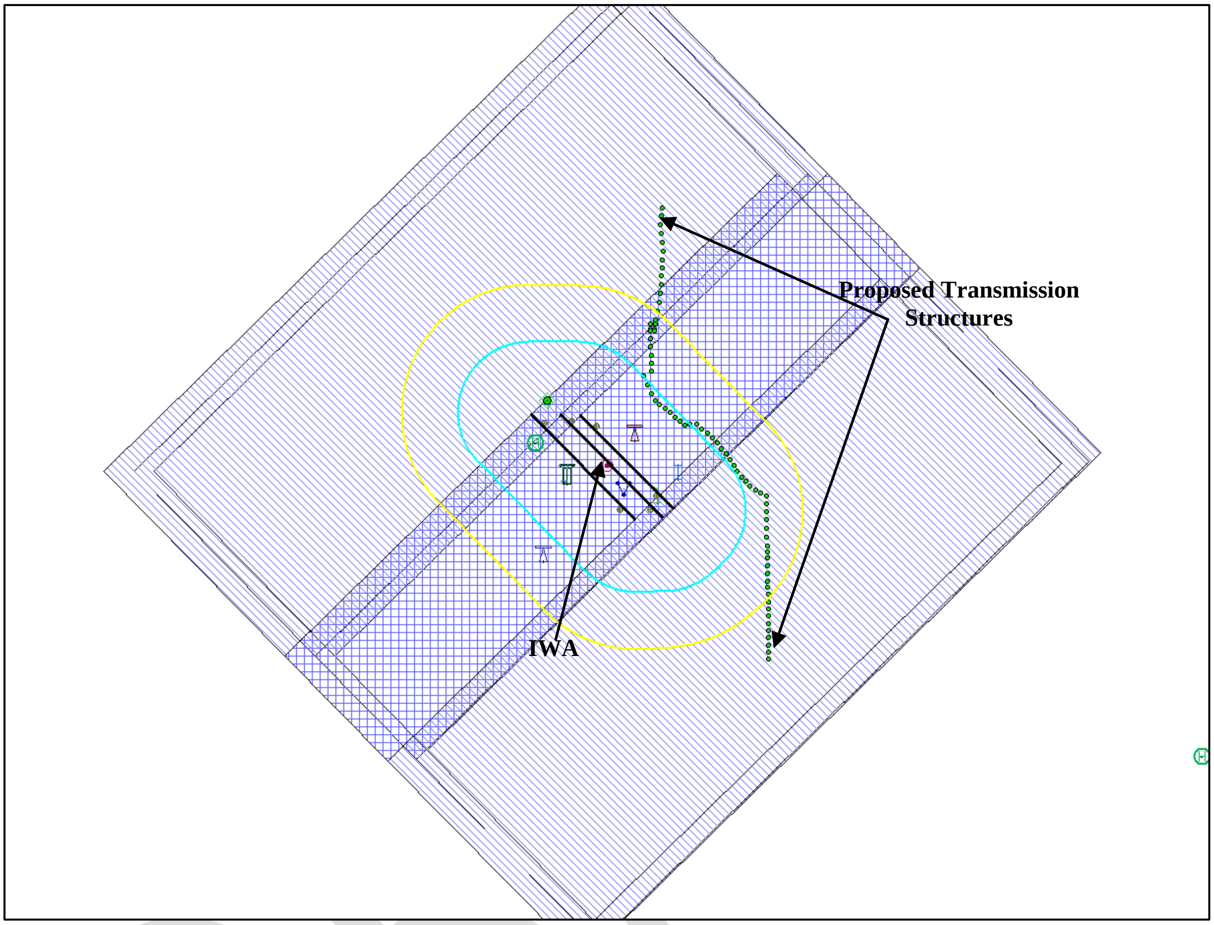


Figure 9: IWA VFR Traffic Pattern Airspace

The VFR Traffic Pattern Airspace is made up of the VFR Horizontal, VFR Conical, and Climb & Descend Areas. The VFR Climb & Descend area at the Phoenix-Mesa Gateway Airport (IWA) partially extends over the proposed transmission structures. The maximum allowable height within the VFR Climb & Descend Area is 1734 feet AMSL. The FAA is usually very hesitant to allow penetrations to the Climb & Descend area. However, none of the proposed transmission structures will adversely affect the IWA VFR Traffic Pattern Airspace.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

Instrument Approach Procedures

IWA Instrument Approach Procedures Composite

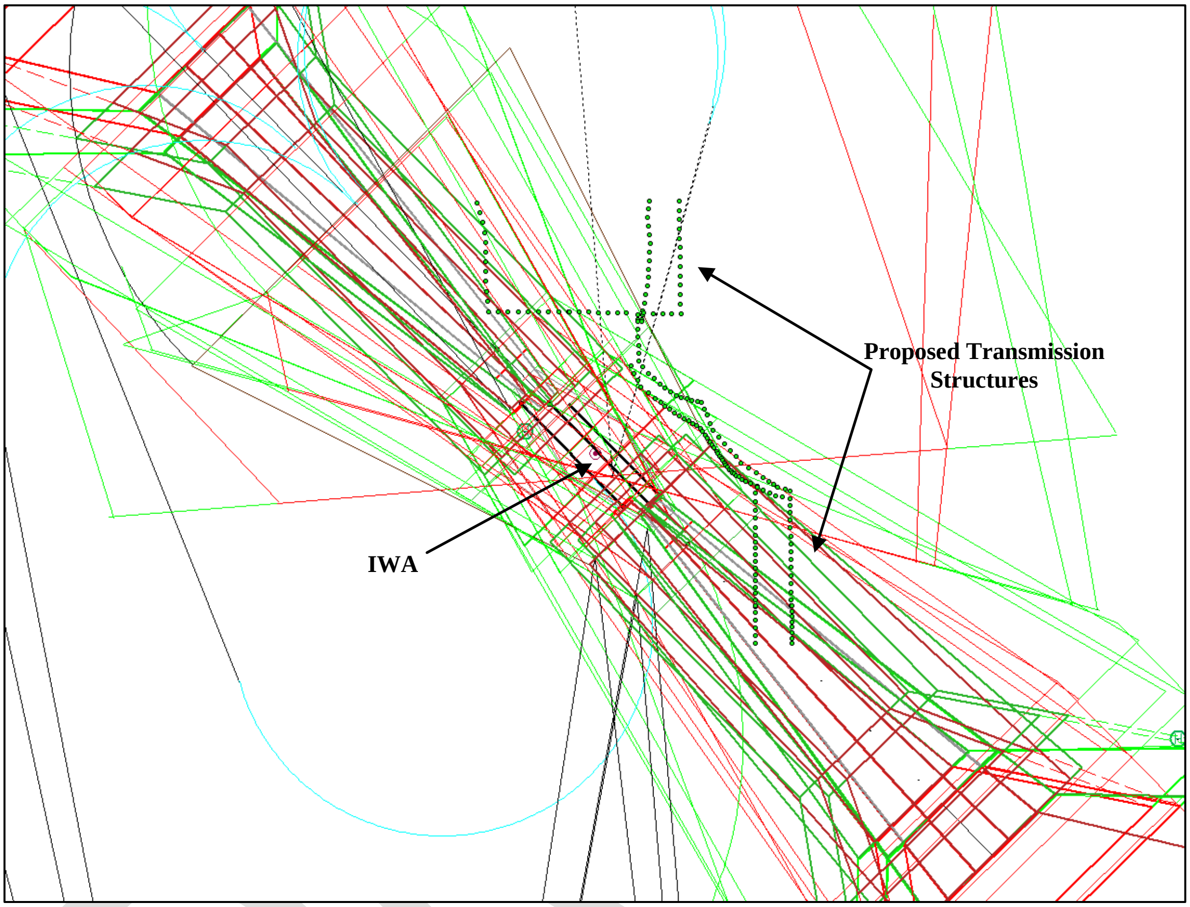


Figure 10: IWA IAP Composite Image

Phoenix-Mesa Gateway Airport (IWA) has several IFR procedures associated with it. The proposed structures may adversely impact Instrument Approach Procedures at IWA.

IWA LNAV RWY 12C Procedure

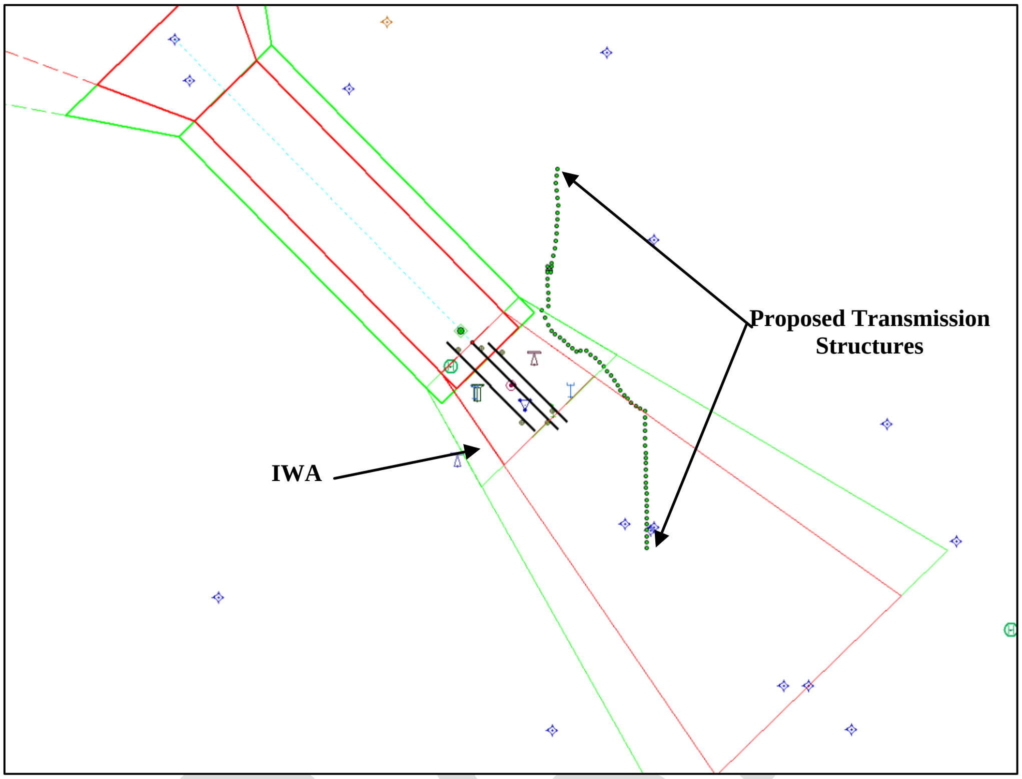


Figure 11: Phoenix-Mesa Gateway Airport (IWA) LNAV Runway 12C Procedure

The Runway 12C LNAV Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown partially extending over the proposed transmission structures. The lowest maximum allowable height within the Missed Approach Flat Surface Length for the RWY 12C LNAV Procedure is 1640 feet AMSL. The proposed transmission structures will have no effect upon the IWA RWY 12C LNAV procedure.

Please see Appendix B: IWA RNAV (GPS) RWY 12C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LPV RWY 12C Procedure

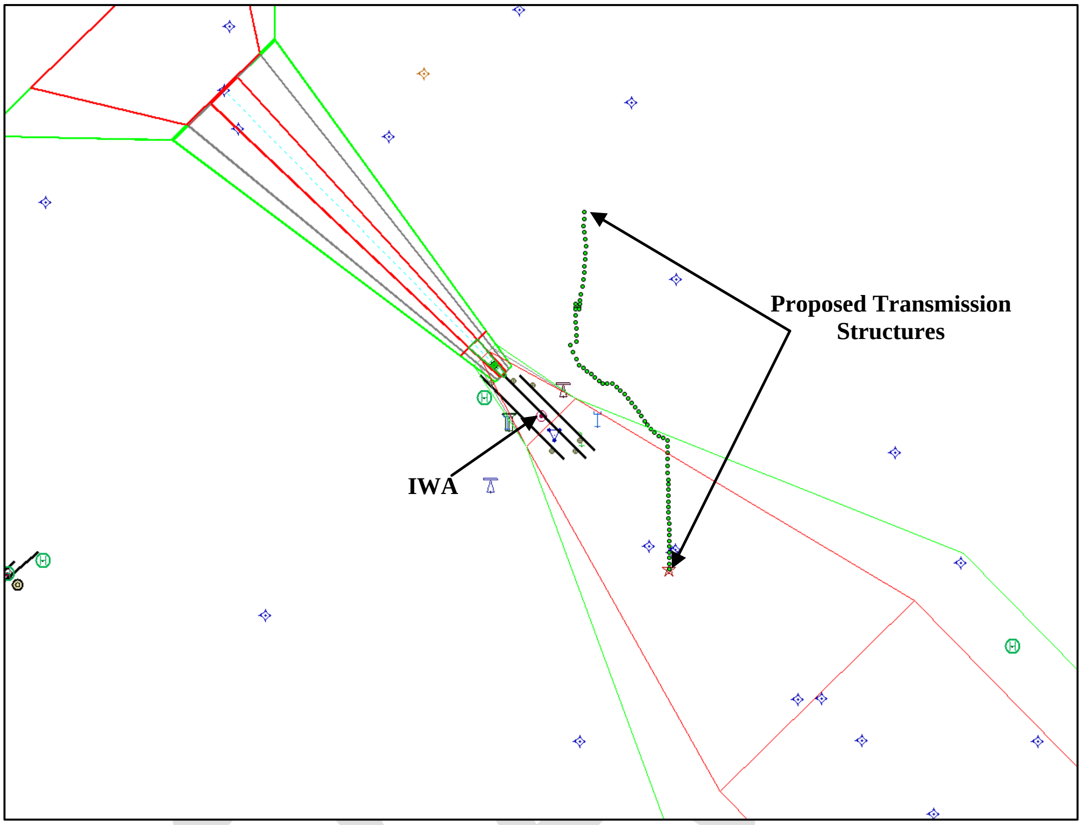


Figure 12: Phoenix-Mesa Gateway Airport (IWA) LPV Runway 12C Procedure

The Runway 12C LPV Procedure for the Phoenix-Mesa Gateway Airport (IWA) Airport is a 3-dimensional procedure that extends over the proposed transmission structures. The LPV primary area has 3 distinct obstruction surfaces (W, X and Y), in addition to two missed approach areas.

The lowest maximum allowable height within the LPV RWY 12C Missed Approach Procedure is 1903 feet AMSL. The proposed transmission structures will have no effect upon the RWY 12C LPV Missed Approach procedure.

Please see Appendix B: IWA RNAV (GPS) RWY 12C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA VNAV RWY 12C Procedure

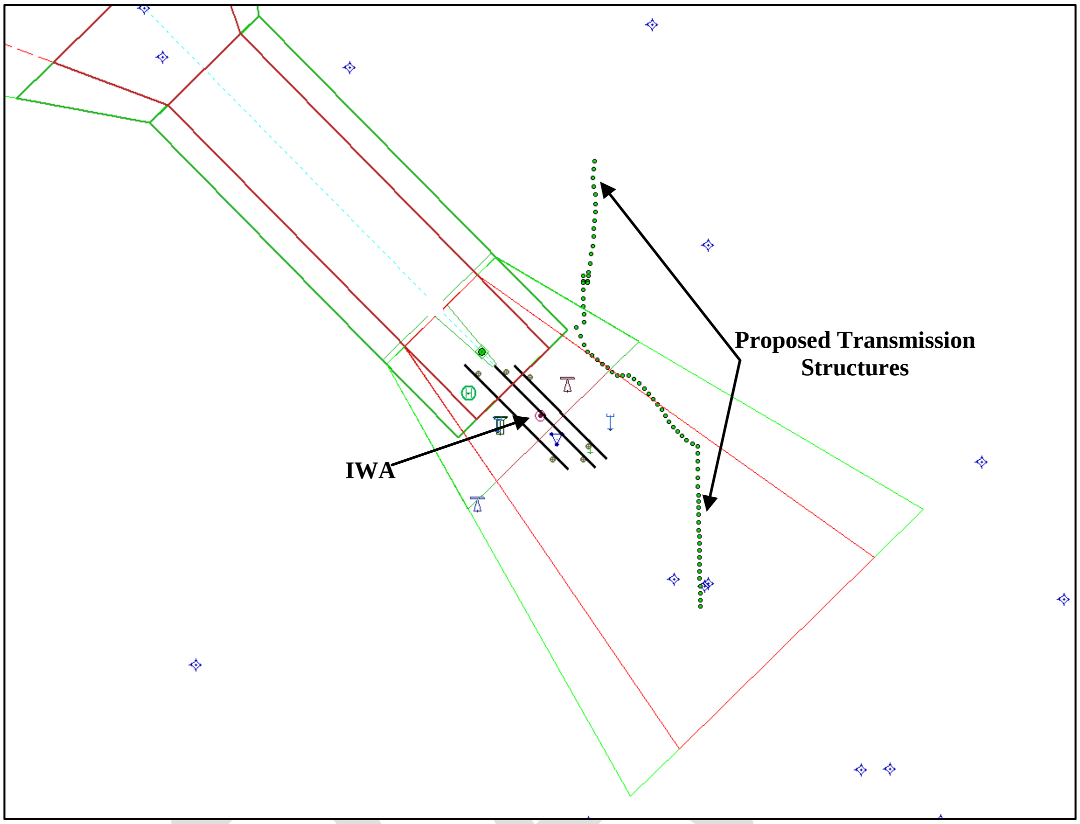


Figure 13: Phoenix-Mesa Gateway Airport (IWA) VNAV Runway 12C Procedure

The Runway 12C VNAV Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown partially extending over the proposed transmission structures. The lowest maximum allowable height within the RWY 12C VNAV Missed Approach is 1525 feet AMSL. The proposed transmission structures will have no effect upon the IWA RWY 12C VNAV Approach Procedure.

Please see Appendix B: IWA RNAV (GPS) RWY 12C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA PAPI RWY 12C Procedure

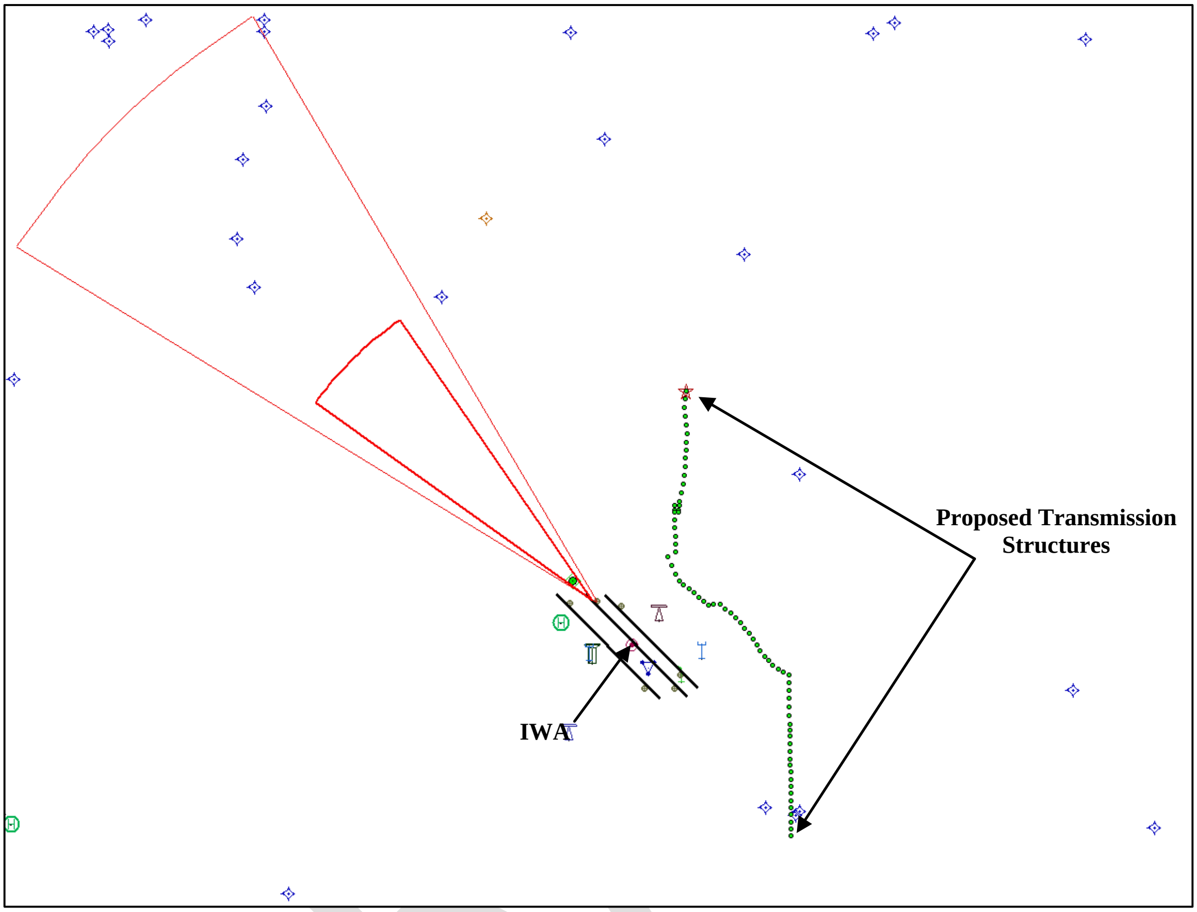


Figure 14: Phoenix-Mesa Gateway Airport (IWA) RWY 12C PAPI OCS

The Precision Approach Path Indicator (PAPI) for IWA RWY 12C is located at 33° 18" 58.69" N and 111° 39' 48.11" W. The RWY 12C PAPI has a standard glide path angle of 3.00°. PAPI's have two surfaces associated with them, the PAPI OCS and the PAPI Light Source Clearance Surface (LSCS). None of the proposed transmission structures will affect the IWA RWY 12C PAPI.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA ILS RWY 30C Procedure

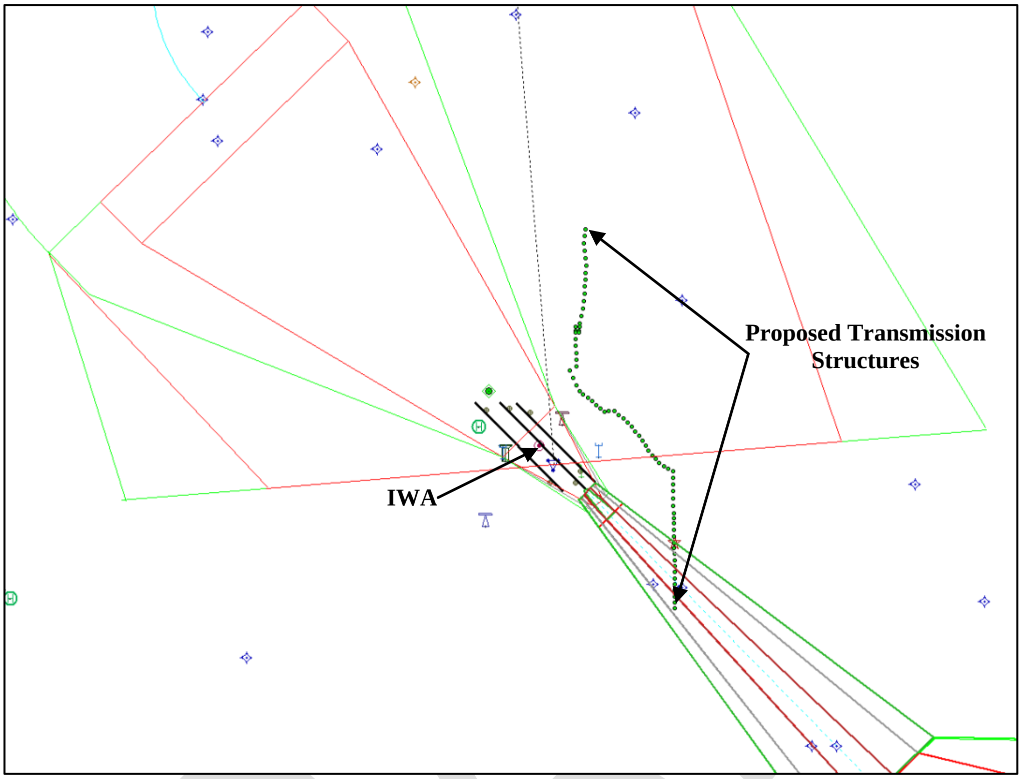


Figure 15: Phoenix-Mesa Gateway Airport (IWA) ILS Runway 30C Procedure

The Runway 30C ILS Procedure for the Phoenix-Mesa Gateway Airport (IWA) Airport is a 3-dimensional procedure that extends over the proposed transmission structures. The ILS primary area has 3 distinct obstruction surfaces (W, X and Y), in addition to two missed approach areas. The proposed structures are partially located within the 'W', 'X' and 'Y' primary surfaces of the IWA RWY 30C ILS. The lowest maximum allowable height within the RWY 30C ILS Procedure is 1671 feet AMSL. The proposed transmission structures will have no effect upon the RWY 30C ILS Approach and Missed Approach Procedures.

Please see Appendix F: IWA ILS RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LNAV RWY 30C Procedure

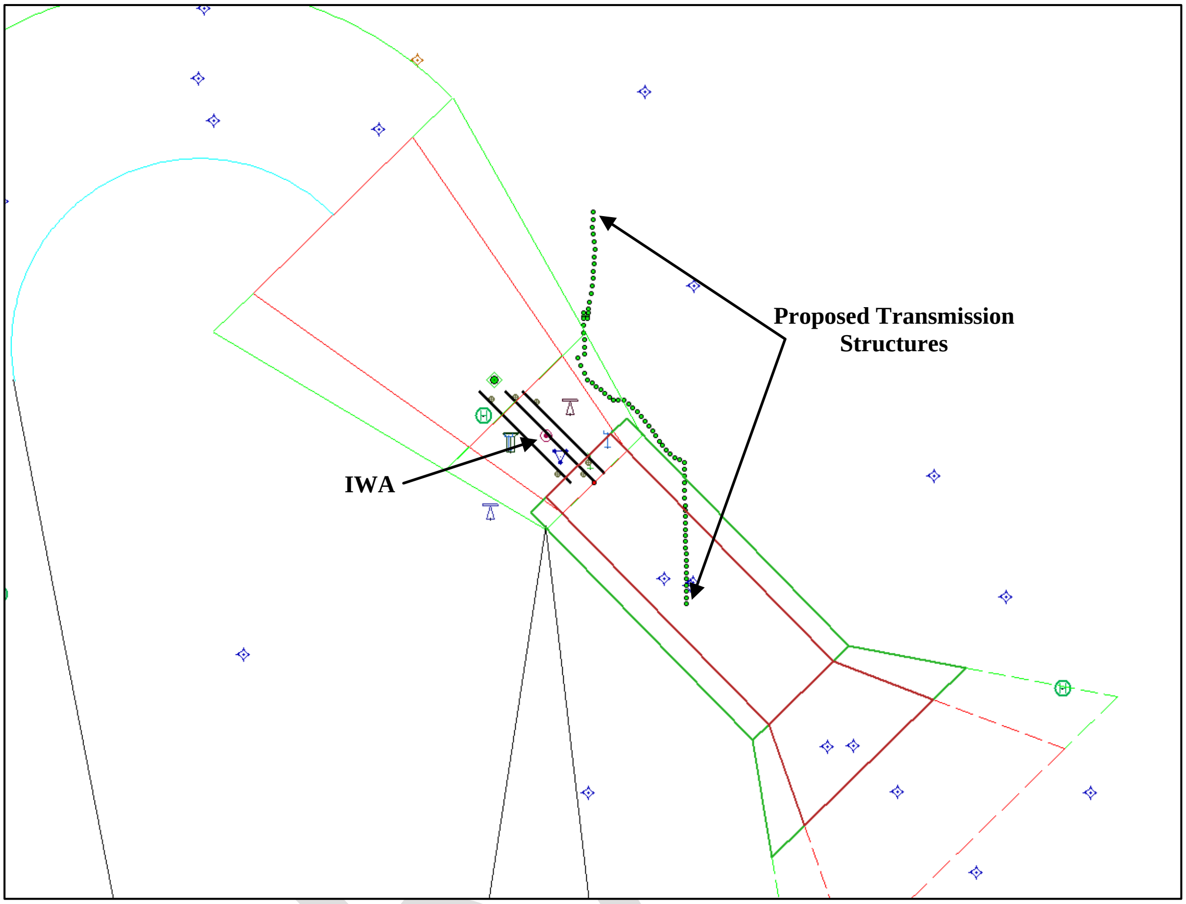


Figure 16: Phoenix-Mesa Gateway Airport (IWA) Runway 30C LNAV Procedure

The Runway 30C LNAV Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown partially extending of the proposed transmission structures. The lowest maximum allowable height within the RWY 30C LNAV Primary Surface is 1550 feet AMSL. None of the proposed transmission structures will exceed the IWA RWY 30C LNAV procedure.

Please see Appendix E: IWA RNAV (GPS) RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LOC RWY 30C Procedure

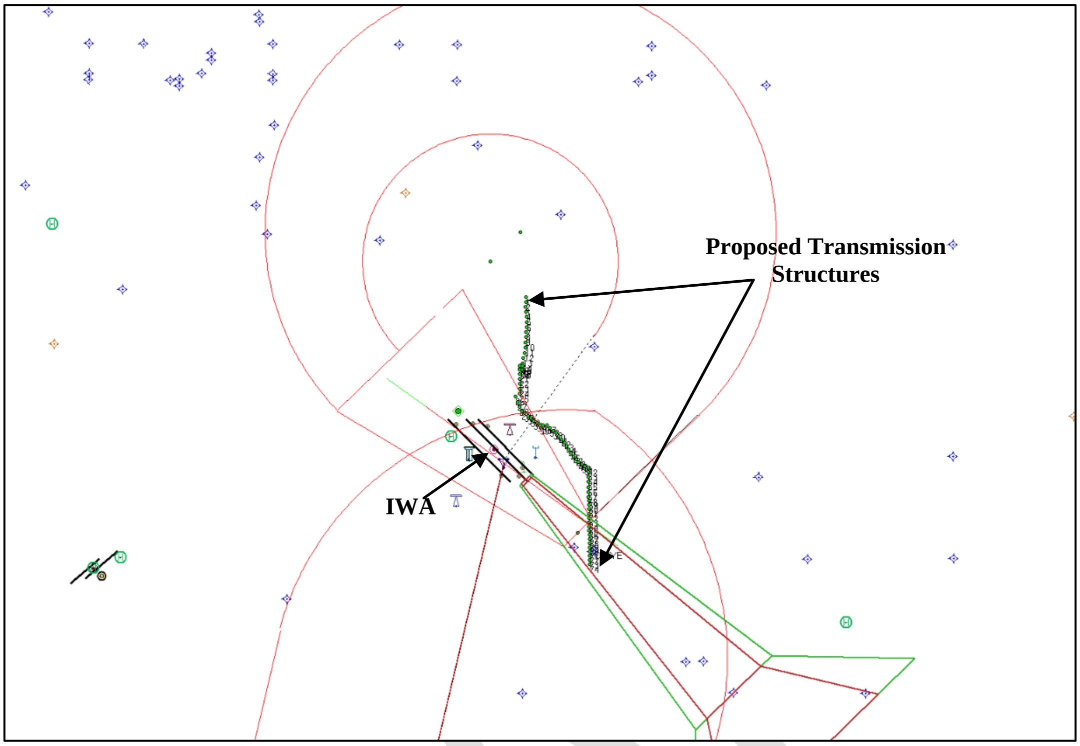


Figure 17: Phoenix-Mesa Gateway Airport (IWA) LOC Runway 30C Procedure

The Runway 30C LOC Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown partially extending over the proposed transmission structures. The lowest maximum allowable height within the Final Segment for the RWY 30C LOC Procedure is 1550 feet AMSL. None of the proposed transmission structures will exceed the IWA RWY 30C LOC Approach surface.

Please see Appendix F: IWA ILS RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LPV RWY 30C Procedure

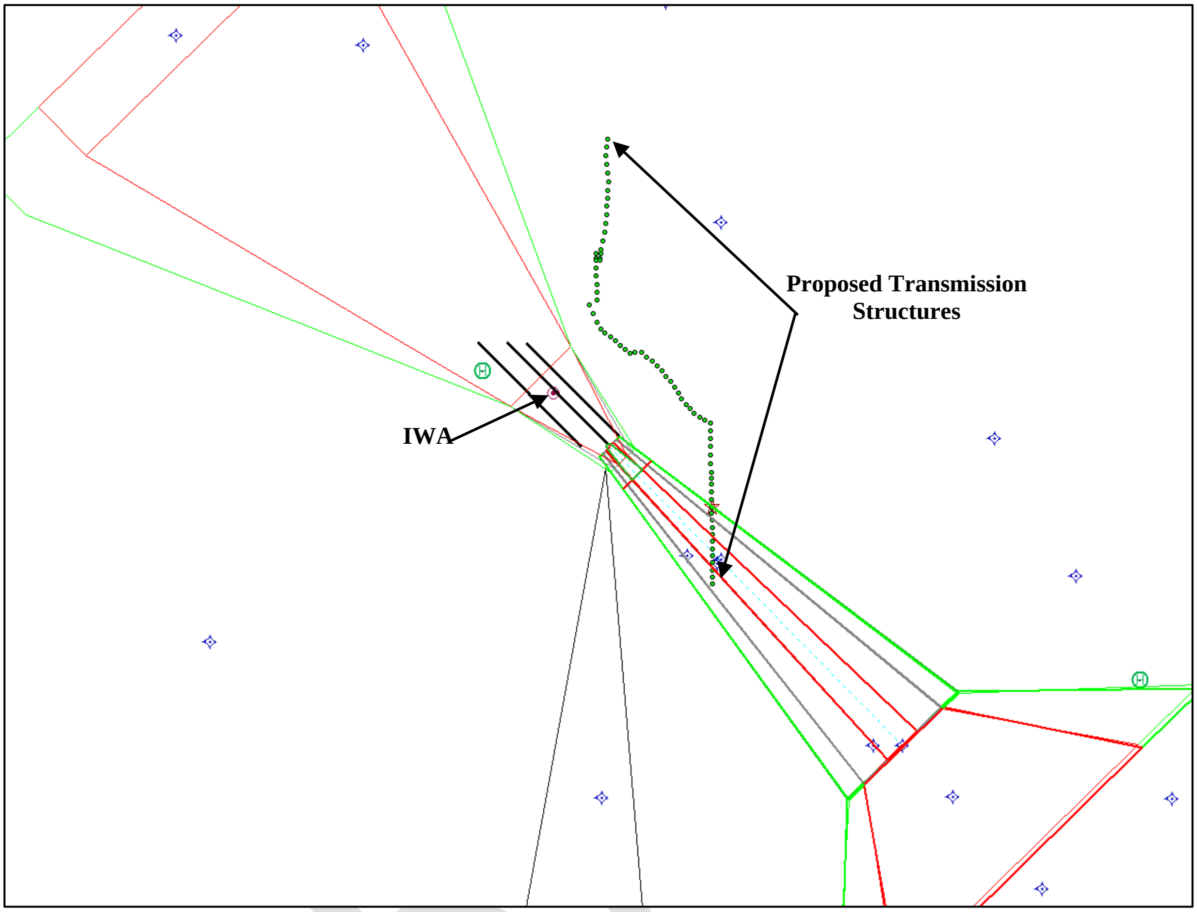


Figure 18: IWA Runway 30C LPV Procedure

The Runway 30C LPV Procedure for the Capital City (IWA) Airport is a 3-dimensional procedure that partially extends over the proposed transmission structures. The LPV primary area has 3 distinct obstruction surfaces (W, X and Y), in addition to two missed approach areas. The proposed structures are located within the Approach surface of the LPV. The lowest maximum allowable height over the proposed structures is 1671 feet AMSL. The proposed transmission structures will have no effect upon the IWA RWY 30C LPV.

Please see Appendix E: IWA RNAV (GPS) RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA VOR RWY 30C Procedure

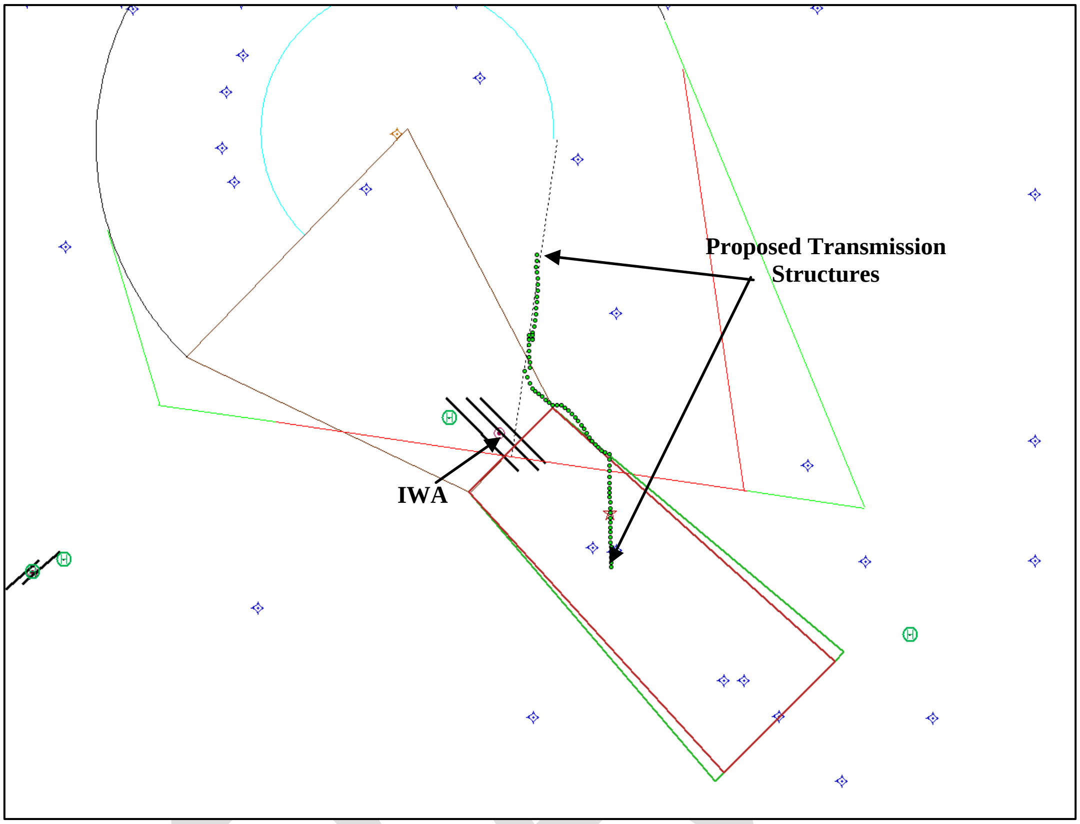


Figure 19: Phoenix-Mesa Gateway Airport (IWA) VOR Runway 30C Procedure

The Runway 30C VOR Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown extending over the proposed transmission structures. The lowest maximum allowable height within the Primary Surface for the RWY 30C VOR Procedure is 1550 feet AMSL. None of the proposed transmission structures will exceed the IWA RWY 30C VOR Approach surface.

Please see Appendix H: IWA VOR or TACAN RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA VNAV RWY 30C Procedure

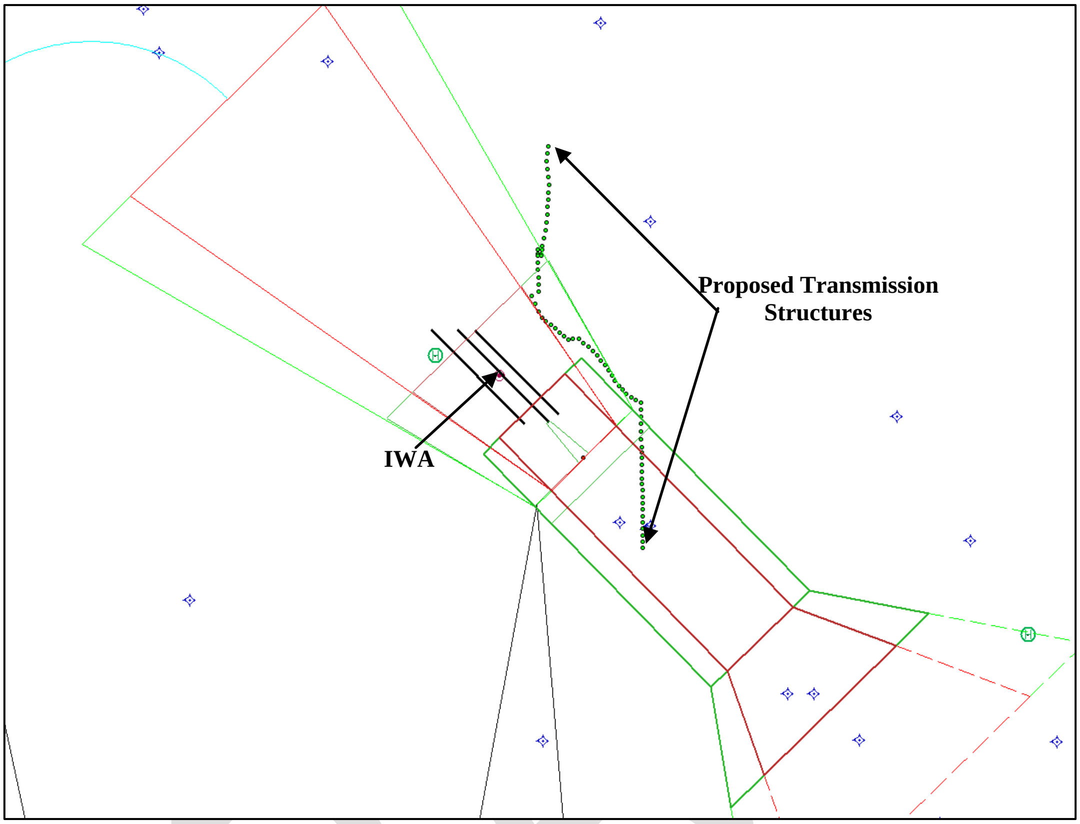


Figure 20: Phoenix-Mesa Gateway Airport (IWA) VNAV Runway 30C Procedure

The Runway 30C VNAV Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown extending over the proposed transmission structures. The lowest maximum allowable height within the RWY 30C VNAV Missed Approach Flat Surface Length is 1469 feet AMSL. Two (2) of the proposed transmission structures will exceed the IWA RWY 30C Approach surfaces. Thirty-Two (32) of the proposed transmission structures will exceed the IWA RWY 30C VNAV Missed Approach Surfaces. This would warrant a determination of hazard from the FAA for these structures. The FAA will not put structures penetrating this surface out for public circularization unless airport support for modification of this procedure is gained.

Please see Appendix E: IWA RNAV (GPS) RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA RNP 'Z' 0.21 RWY 30C Procedure

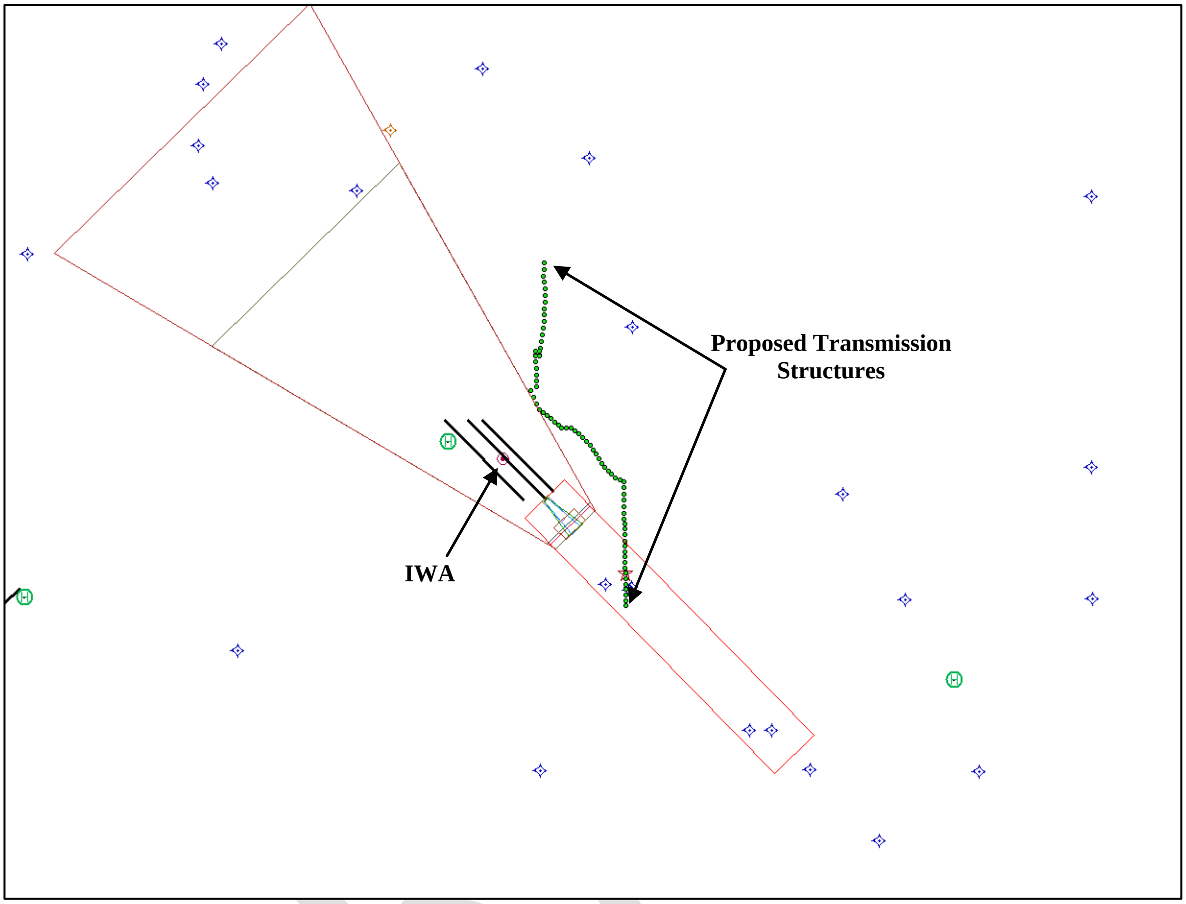


Figure 21: Phoenix-Mesa Gateway Airport (IWA) Runway 30C RNP Z 0.21 Procedure

The Runway 30C RNP Z 0.21 Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown extending over the proposed transmission structures. The lowest maximum allowable height within the RWY 30C RNP Z 0.21 is 1609 feet AMSL. The proposed transmission structures will have no effect upon the IWA RWY 30C RNP Z 0.21.

Please see Appendix G: IWA RNAV (RNP) Z RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA RNP ‘Z’ 0.30 RWY 30C Procedure

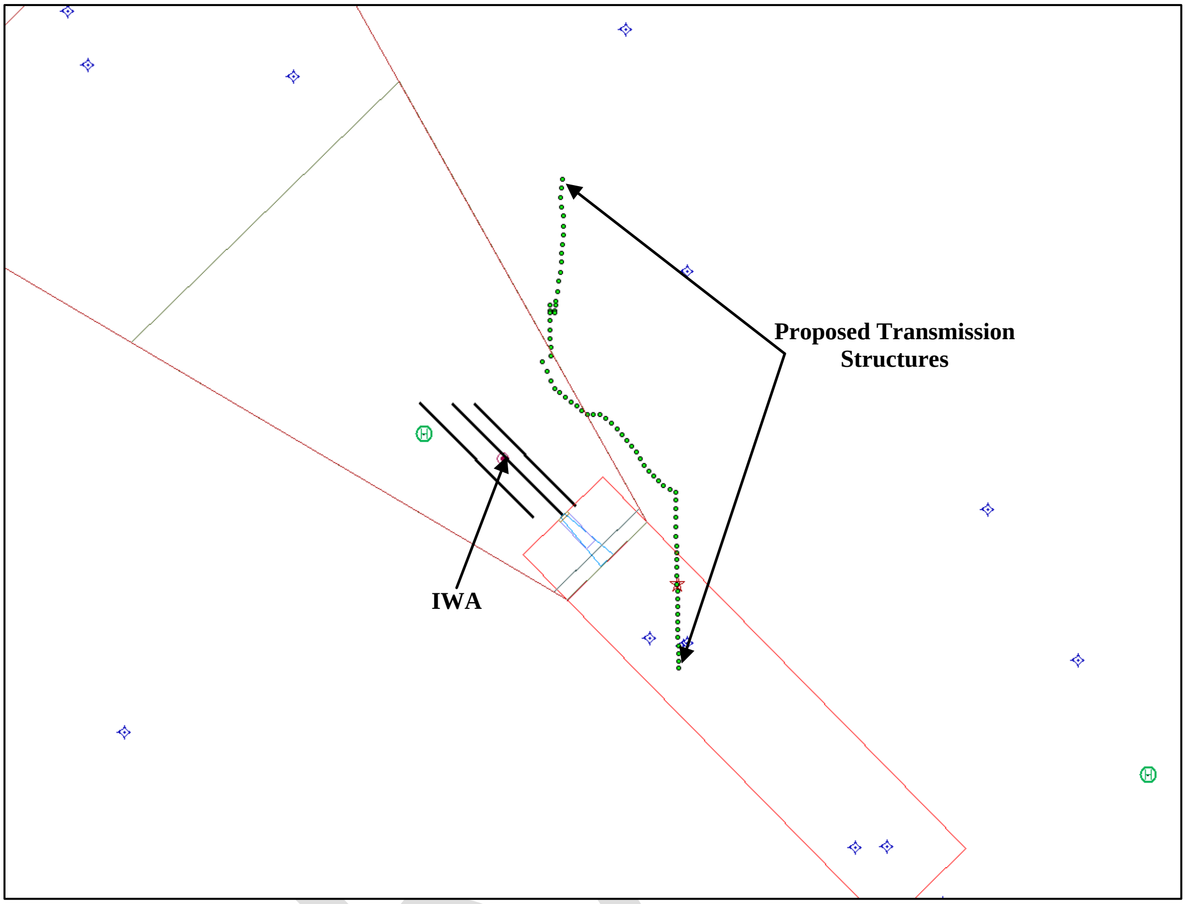


Figure 22: Phoenix-Mesa Gateway Airport (IWA) Runway 30C RNP Z 0.30 Procedure

The Runway 30C RNP Z 0.30 Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown extending over the proposed transmission structures. The lowest maximum allowable height within the RWY 30C RNP Z 0.30 is 1507 feet AMSL. None of the proposed transmission structures will exceed the IWA RWY 30C RNP Z 0.30 procedure.

Please see Appendix G: IWA RNAV (RNP) Z RWY 30C Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA PAPI RWY 30C Procedure

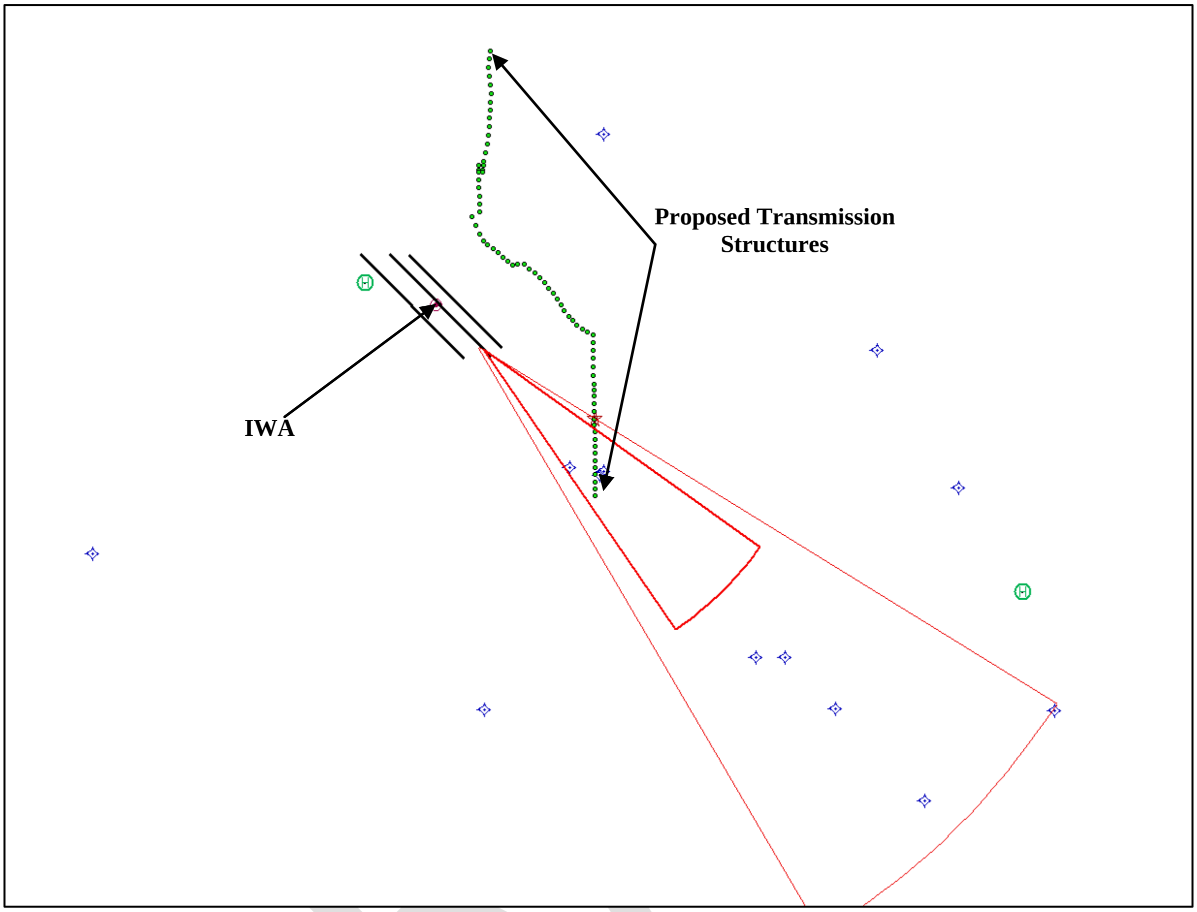


Figure 23: Phoenix-Mesa Gateway Airport (IWA) PAPI Runway 30C Procedure

The Precision Approach Path Indicator (PAPI) for IWA RWY 30C is located at 33° 17” 56.87” N and 111° 38’ 43.33” W. The RWY 30C PAPI has a standard glide path angle of 3.00°. PAPI’s have two surfaces associated with them, the PAPI OCS and the PAPI Light Source Clearance Surface (LSCS). The lowest maximum allowable height within both RWY 30C PAPI surfaces is 1696 feet AMSL. None of the proposed transmission structures will affect the IWA RWY 30C PAPI.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LNAV RWY 12R Procedure

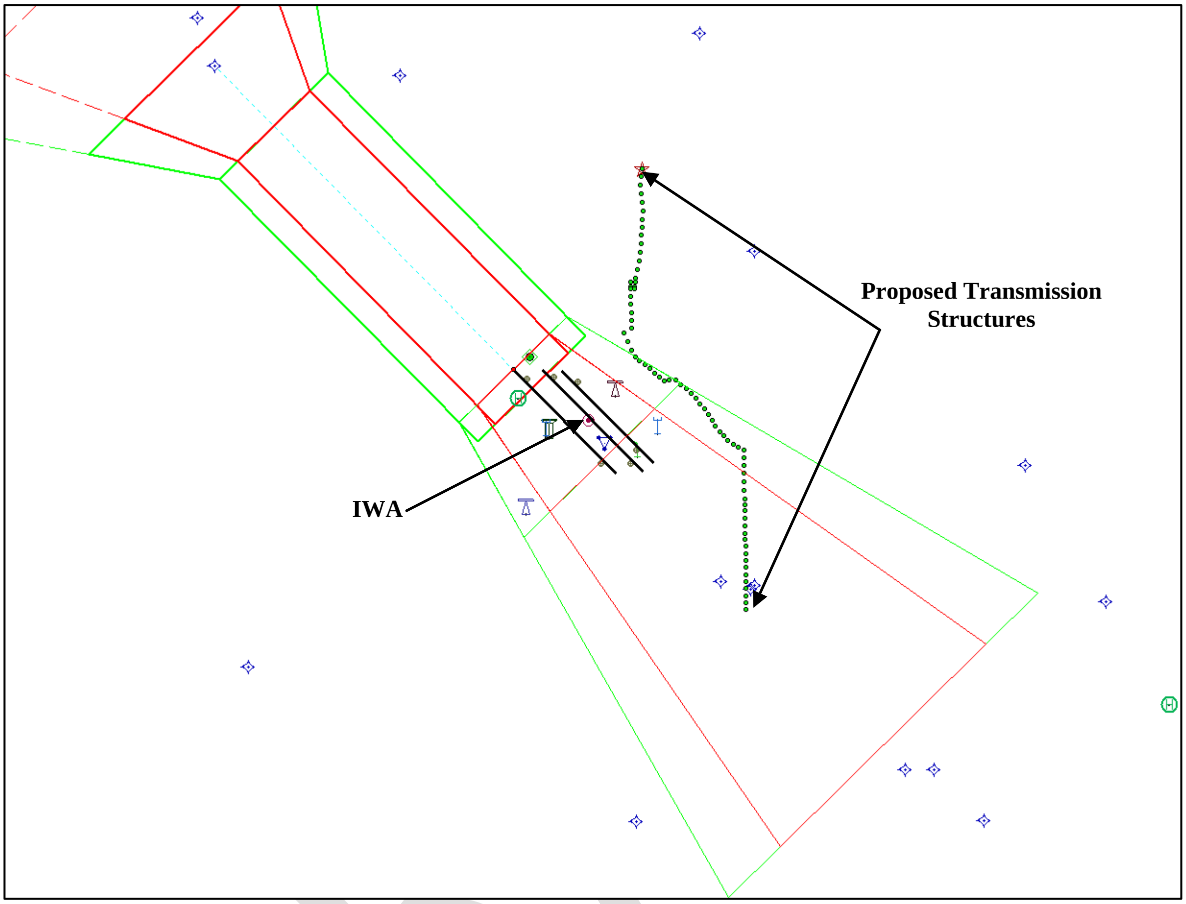


Figure 24: Phoenix-Mesa Gateway Airport (IWA) Runway 12R LNAV Procedure

The Runway 12R LNAV Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown partially extending over the proposed transmission structures. The lowest maximum allowable height within the RWY 12R LNAV Missed Approach is 1640 feet AMSL. The proposed transmission structures will have no effect upon the IWA RWY 12R LNAV.

Please see Appendix C: IWA RNAV (GPS) RWY 12R Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LP RWY 12R Procedure

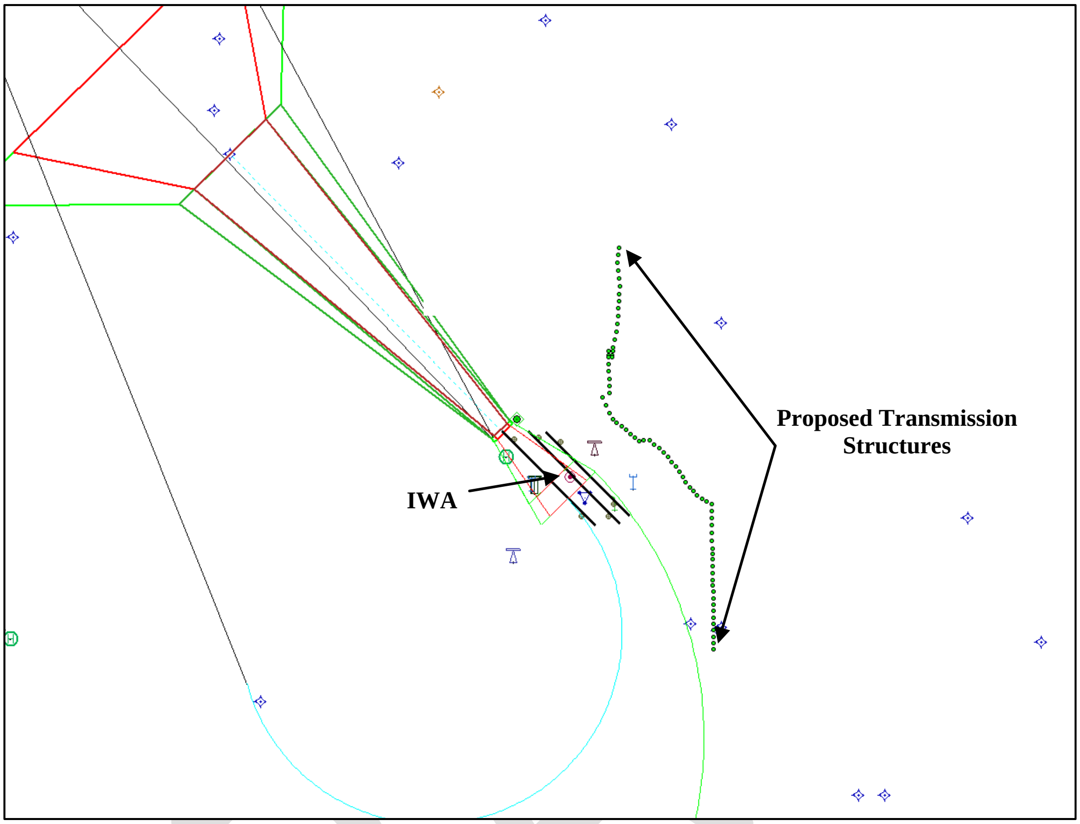


Figure 25: Phoenix-Mesa Gateway Airport (IWA) LP Runway 12R Procedure

The Runway 12R LP Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown extending East of the proposed transmission structures. The Missed Approach has a climbing right turn away from the proposed structures. The proposed transmission structures will have no effect upon the IWA RWY 12R LP procedure.

Please see Appendix C: IWA RNAV (GPS) RWY 12R Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA PAPI RWY 12R Procedure

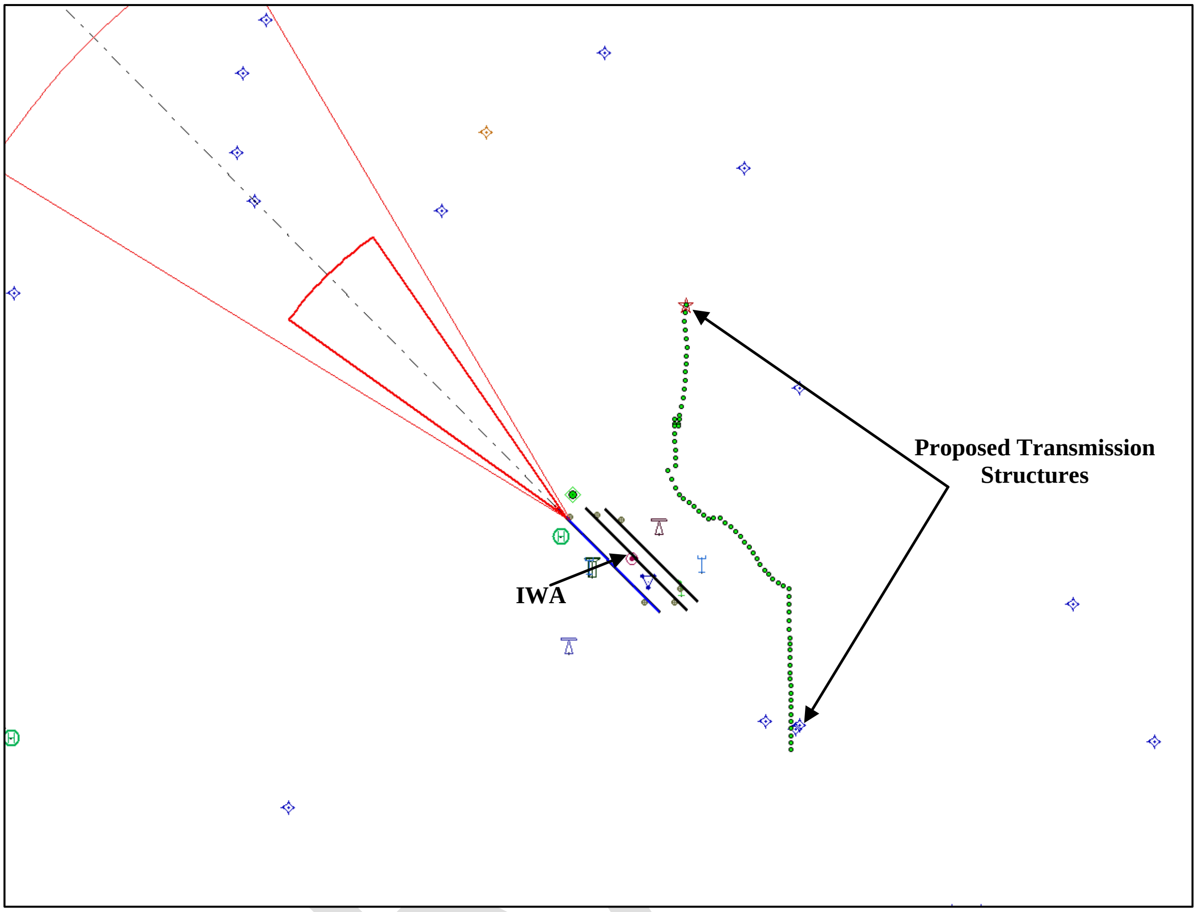


Figure 26: Phoenix-Mesa Gateway Airport (IWA) PAPI Runway 12R Procedure

The Precision Approach Path Indicator (PAPI) for IWA RWY 12R is located at 33° 18” 57.38” N and 111° 40’ 11.49” W. The RWY 12R PAPI has a standard glide path angle of 3.00°. PAPI’s have two surfaces associated with them, the PAPI OCS and the PAPI Light Source Clearance Surface (LSCS). None of the proposed transmission structures will affect the IWA RWY 12R PAPI.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LNAV RWY 30L Procedure

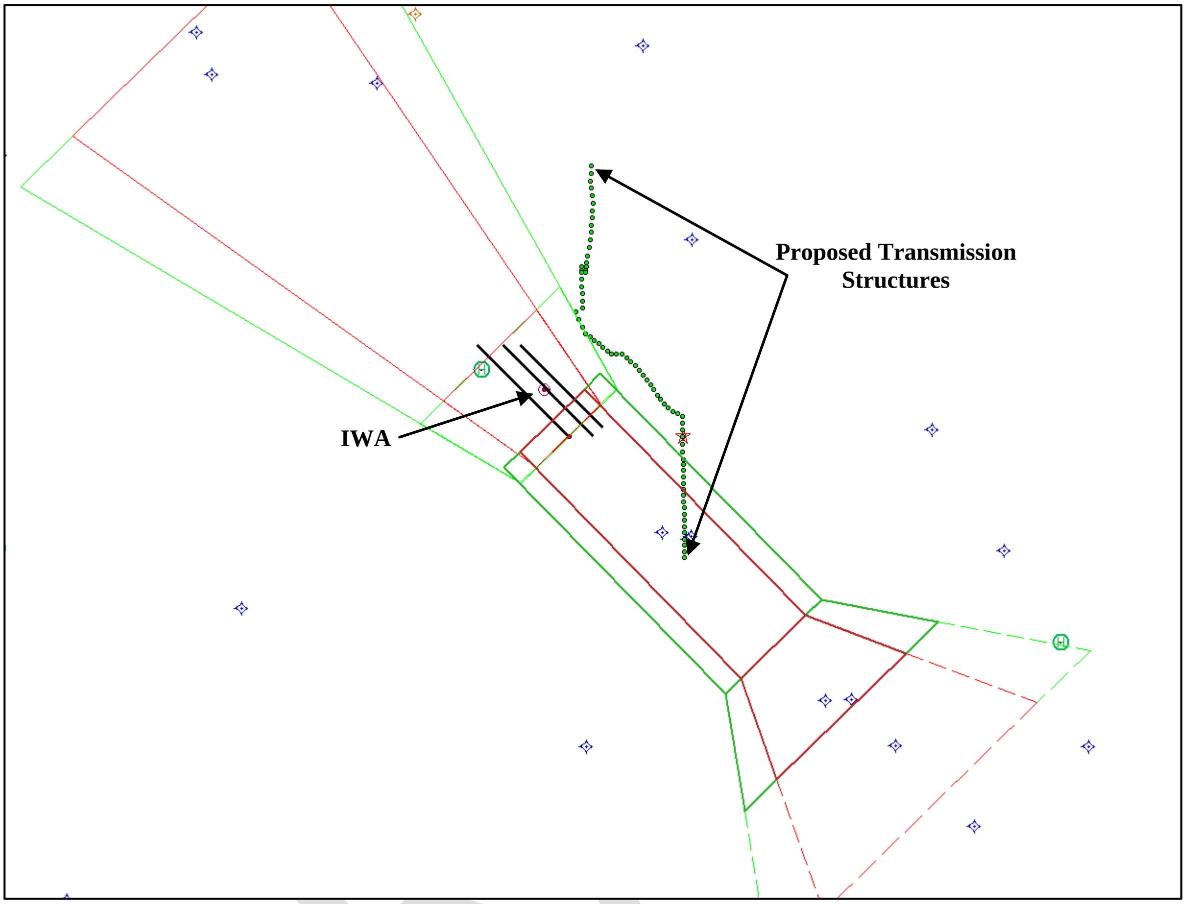


Figure 27: Phoenix-Mesa Gateway Airport (IWA) Runway 30L LNAV Procedure

The Runway 30L LNAV Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown partially extending over the proposed transmission structures. The lowest maximum allowable height within the Final Segment of the RWY 30L LNAV Approach is 1550 feet AMSL. None of the proposed transmission structures will exceed the IWA RWY 30L LNAV Approach surface.

Please see Appendix D: IWA RNAV (GPS) RWY 30L Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA LP RWY 30L Procedure

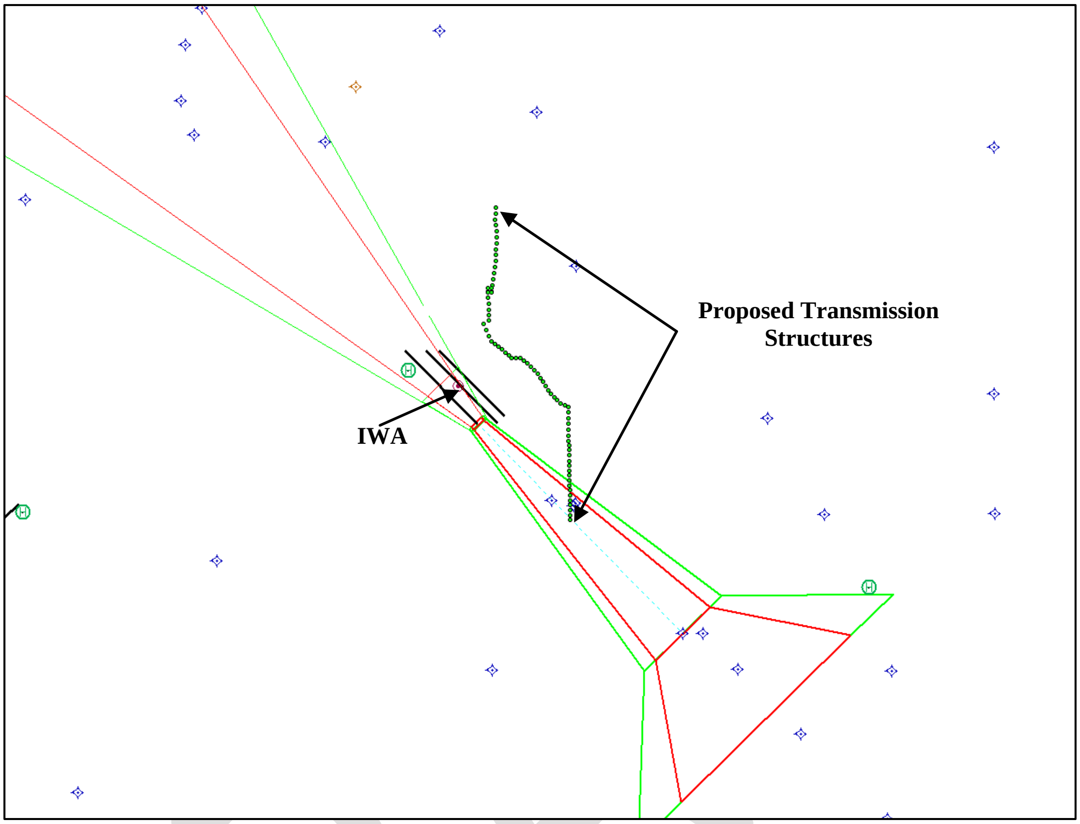


Figure 28: Phoenix-Mesa Gateway Airport (IWA) LP Runway 30L Procedure

The Runway 30L LP Procedure for the Phoenix-Mesa Gateway Airport (IWA) is shown extending over the proposed transmission structures. The lowest maximum allowable height within the Final Segment for the RWY 30L LP procedure is 1550 feet AMSL. None of the proposed transmission structures will exceed the RWY 30L LP Approach.

Please see Appendix D: IWA RNAV (GPS) RWY 30L Approach Plate for parameters and flight details.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA PAPI RWY 30L Procedure

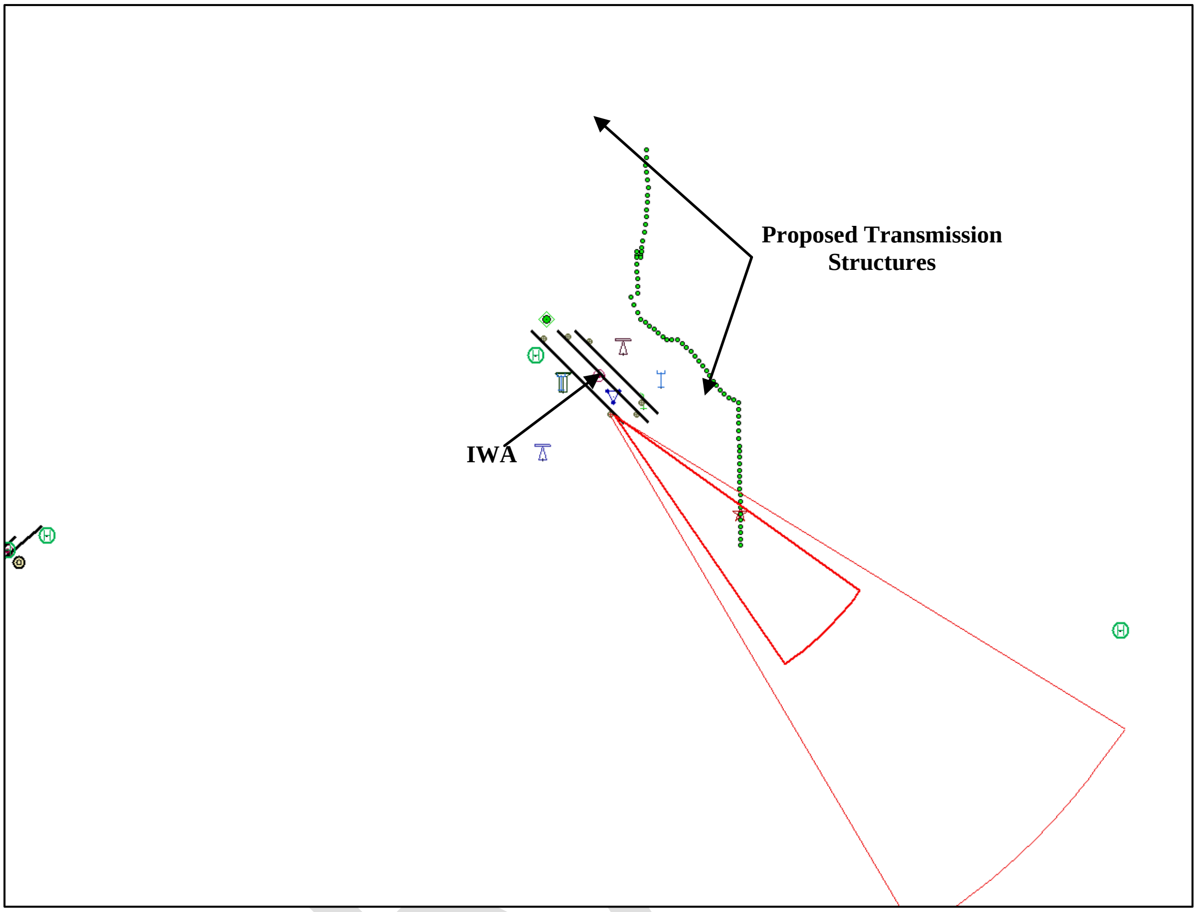


Figure 29: Phoenix-Mesa Gateway Airport (IWA) PAPI Runway 30L Procedure

The Precision Approach Path Indicator (PAPI) for IWA RWY 30L is located at 33° 17” 57.39” N and 111° 39’ 8.54” W. The RWY 30L PAPI has a standard glide path angle of 3.00°. PAPI’s have two surfaces associated with them, the PAPI OCS and the PAPI Light Source Clearance Surface (LSCS). The lowest maximum allowable height within both RWY 30L PAPI surfaces is 1775 feet AMSL. None of the proposed transmission structures will affect the IWA RWY 30L PAPI.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA PAPI RWY 12L Procedure

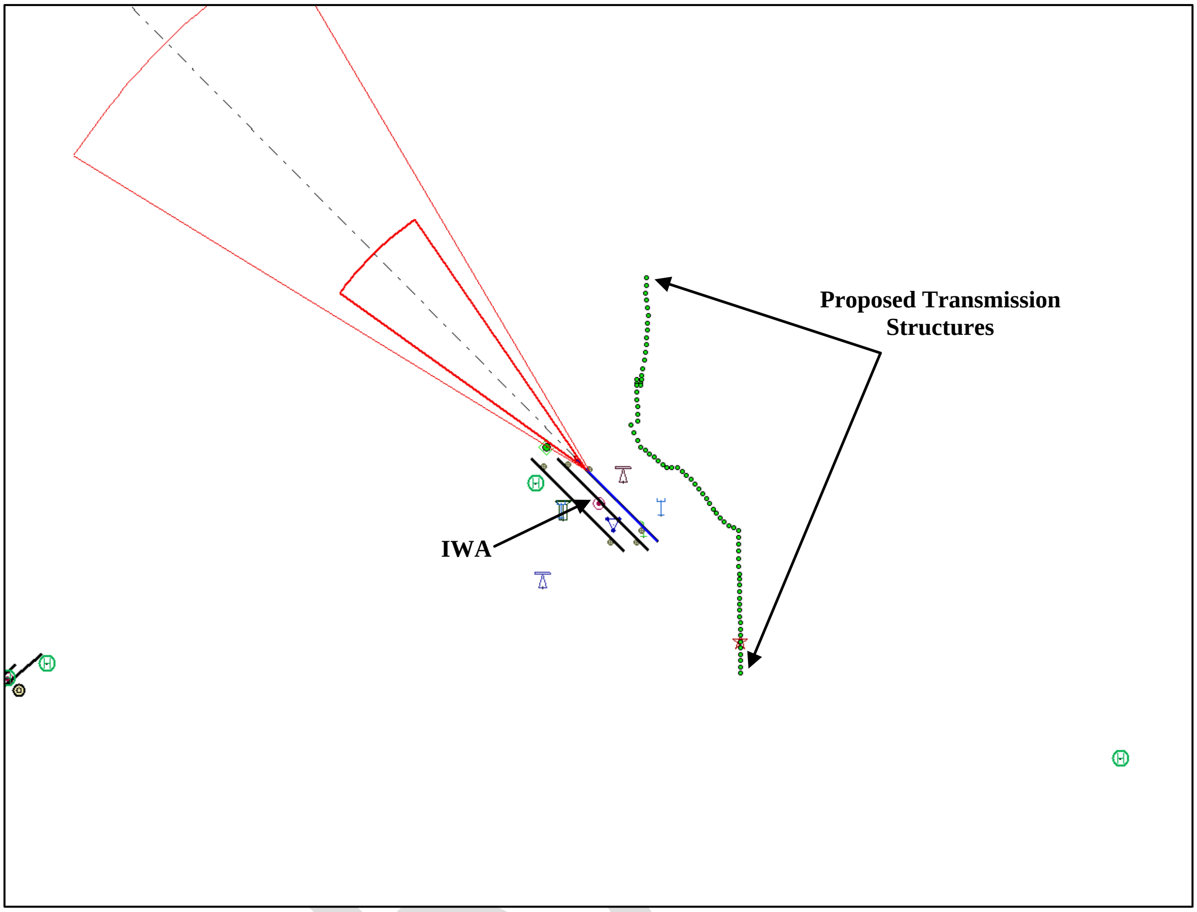


Figure 30: Phoenix-Mesa Gateway Airport (IWA) PAPI Runway 08 Procedure

The Precision Approach Path Indicator (PAPI) for IWA RWY 12 is located at 33° 18" 55.43" N and 111° 39' 27.77" W. The RWY 12L PAPI has a standard glide path angle of 3.00°. PAPI's have two surfaces associated with them, the PAPI OCS and the PAPI Light Source Clearance Surface. None of the proposed transmission structures will affect the IWA RWY 12L PAPI.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA PAPI RWY 30R Procedure

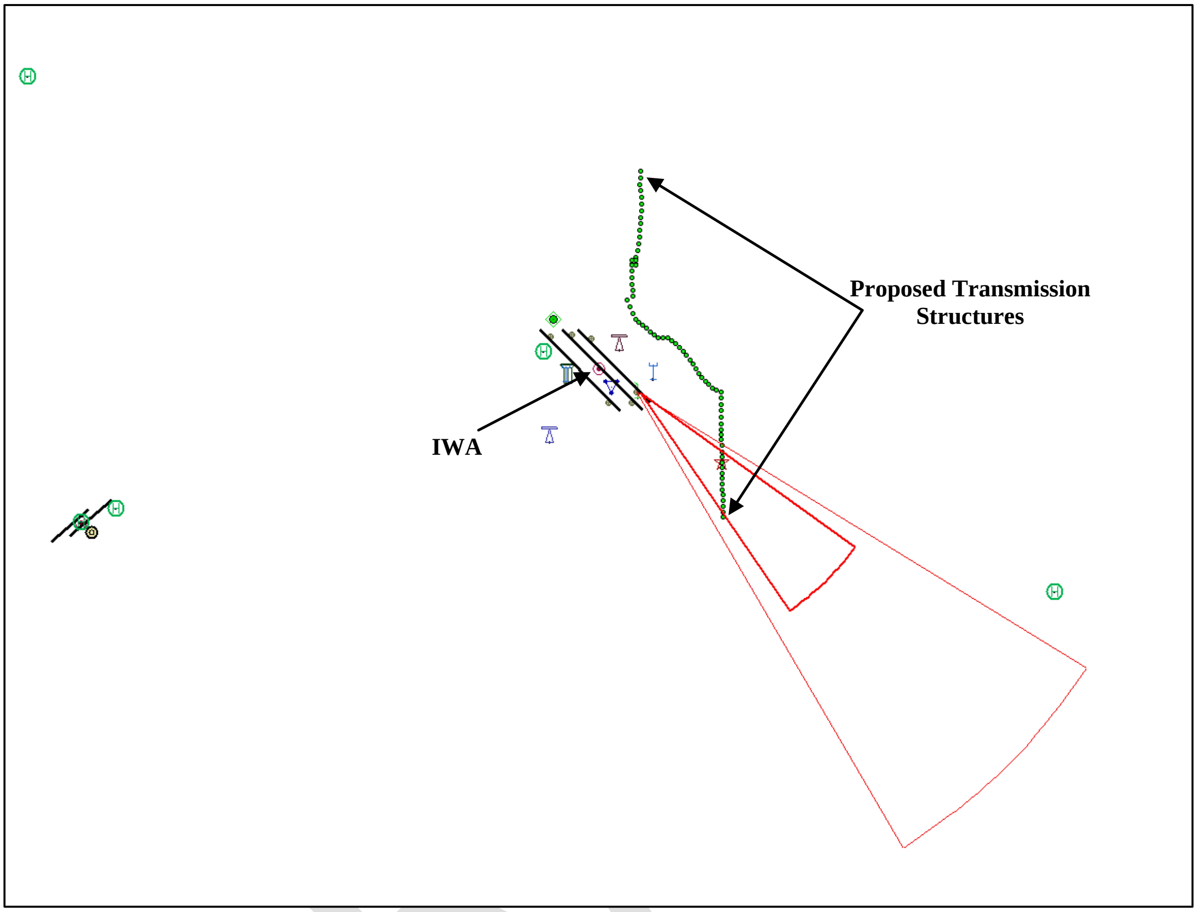


Figure 31: Phoenix-Mesa Gateway Airport (IWA) PAPI Runway 30R Procedure

The Precision Approach Path Indicator (PAPI) for IWA RWY 30R is located at 33° 18” 6.64” N and 111° 38’ 38.27” W. The RWY 30R PAPI has a standard glide path angle of 3.00°. PAPI’s have two surfaces associated with them, the PAPI OCS and the PAPI Light Source Clearance Surface (LSCS). The lowest maximum allowable height within both RWY 30R PAPI surfaces is 1677 feet AMSL. None of the proposed transmission structures will affect the IWA RWY 30R PAPI.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA Circling Areas

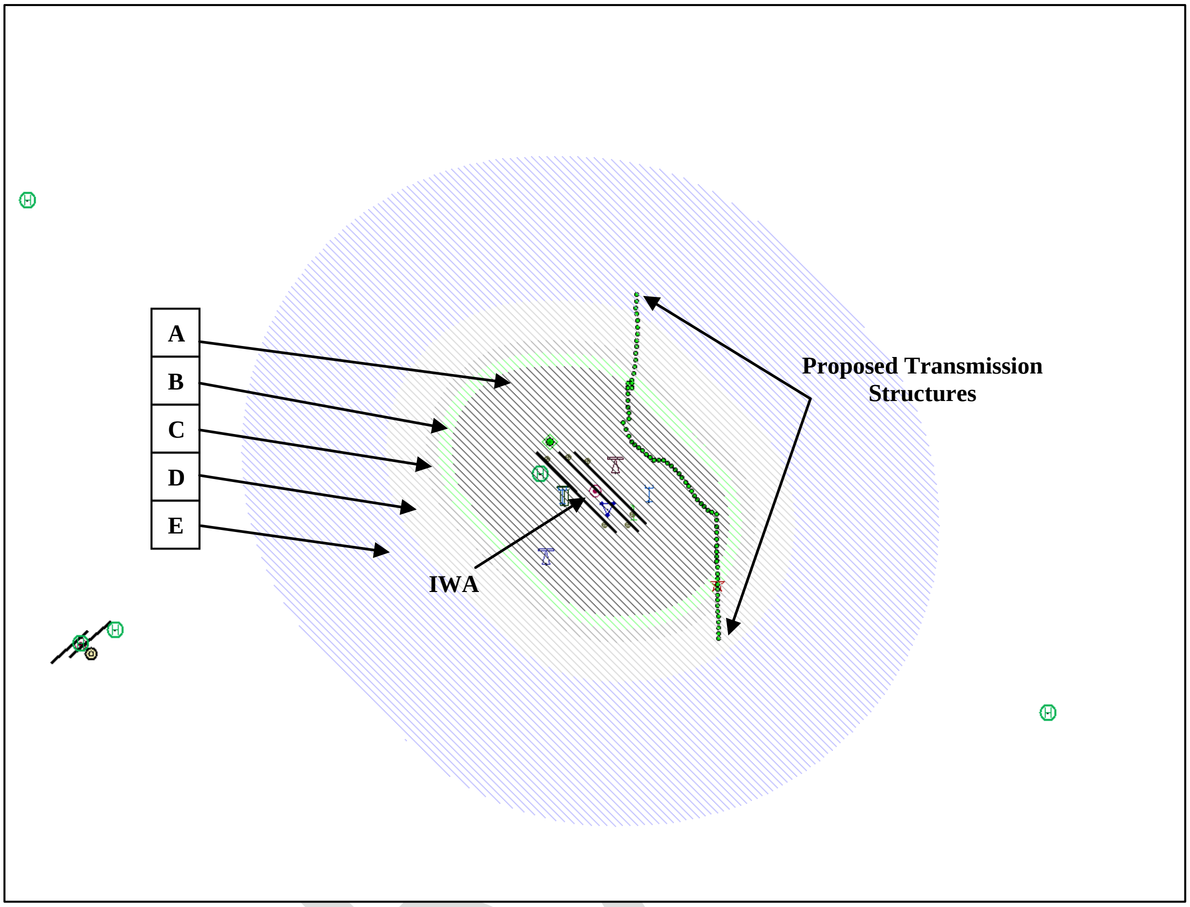


Figure 32: Categories 'A' to 'E' Circling Areas at IWA.

The Category 'A' through 'E' Circling areas at Phoenix-Mesa Gateway Airport (IWA) extend over the proposed transmission structures. The lowest maximum allowable height within the circling areas ranges from 1540 to 1720 feet AMSL. The proposed transmission structures will have no effect upon the IWA Circling Procedures.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

IWA Departure Surfaces

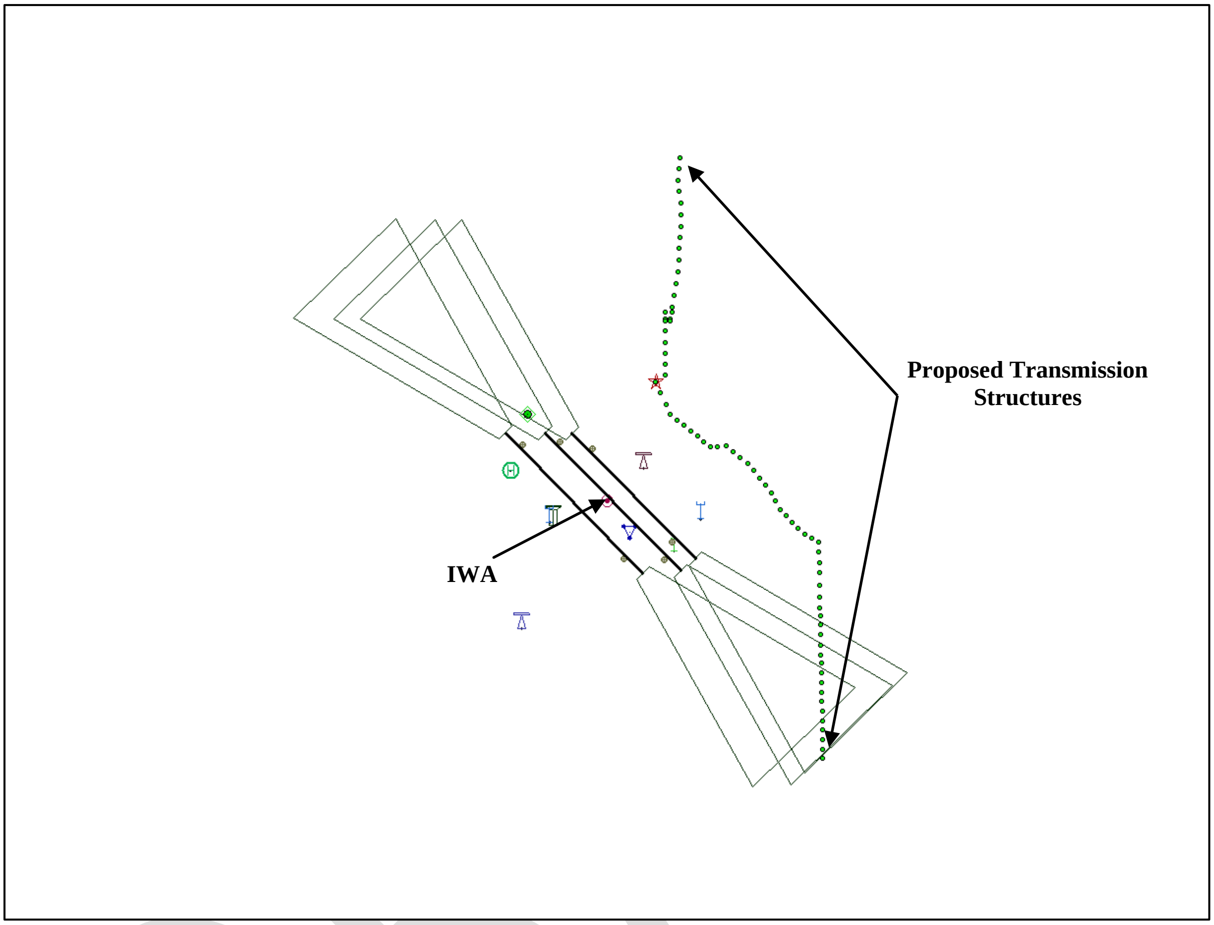


Figure 33: IWA Runway 13 Departure Surface

The Departure Surfaces for each runway at Phoenix-Mesa Gateway Airport (IWA) extend over the proposed transmission structures. The Departure Surfaces are made up of the Initial Climb Area and two Diverse Departure Areas, A & B. The limiting departure surface over the proposed structures is the RWY 12L & 30R Initial Climb Area. The lowest maximum allowable height over the proposed transmission structures is 1570 feet AMSL. The proposed transmission structures will have no impact to the Departure Surfaces at IWA.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

All IWA runway departures follow standard takeoff minimums as shown in Appendix J: IWA Phoenix One Departure Procedures

One Engine Inoperative Surfaces

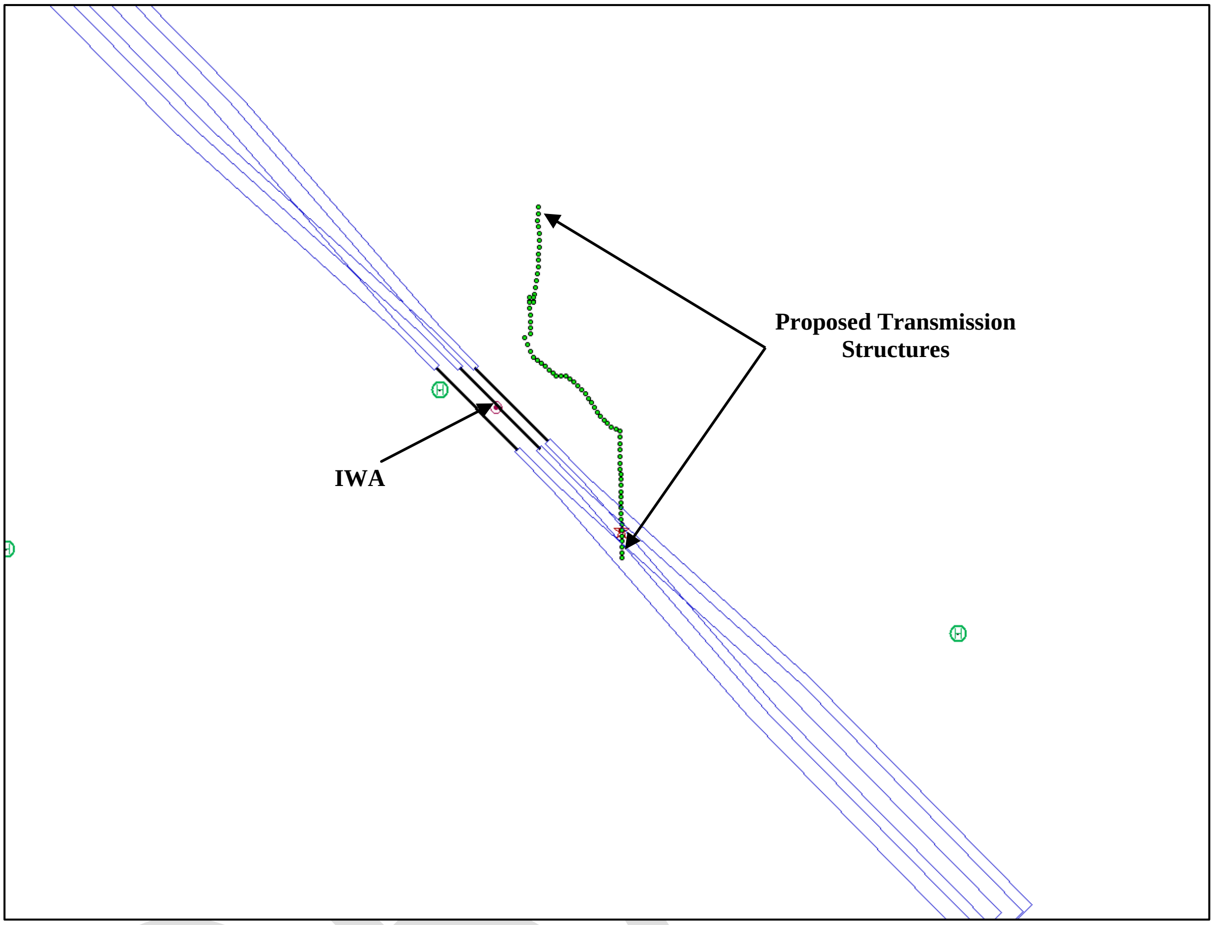


Figure 34: IWA One Engine Inoperative Surfaces

The One Engine Inoperative OEI surface is not a FAA protected surface. However, the IWA Airport may be hesitant to support the project if these surfaces are compromised. The lowest maximum allowable height over the proposed transmission line is 1526 feet AMSL. None of the proposed transmission structures will impact the OEI surfaces at IWA.

Specific structure information can be found in the attached Airspace Point Study Excel Sheet.

Low Altitude Airways

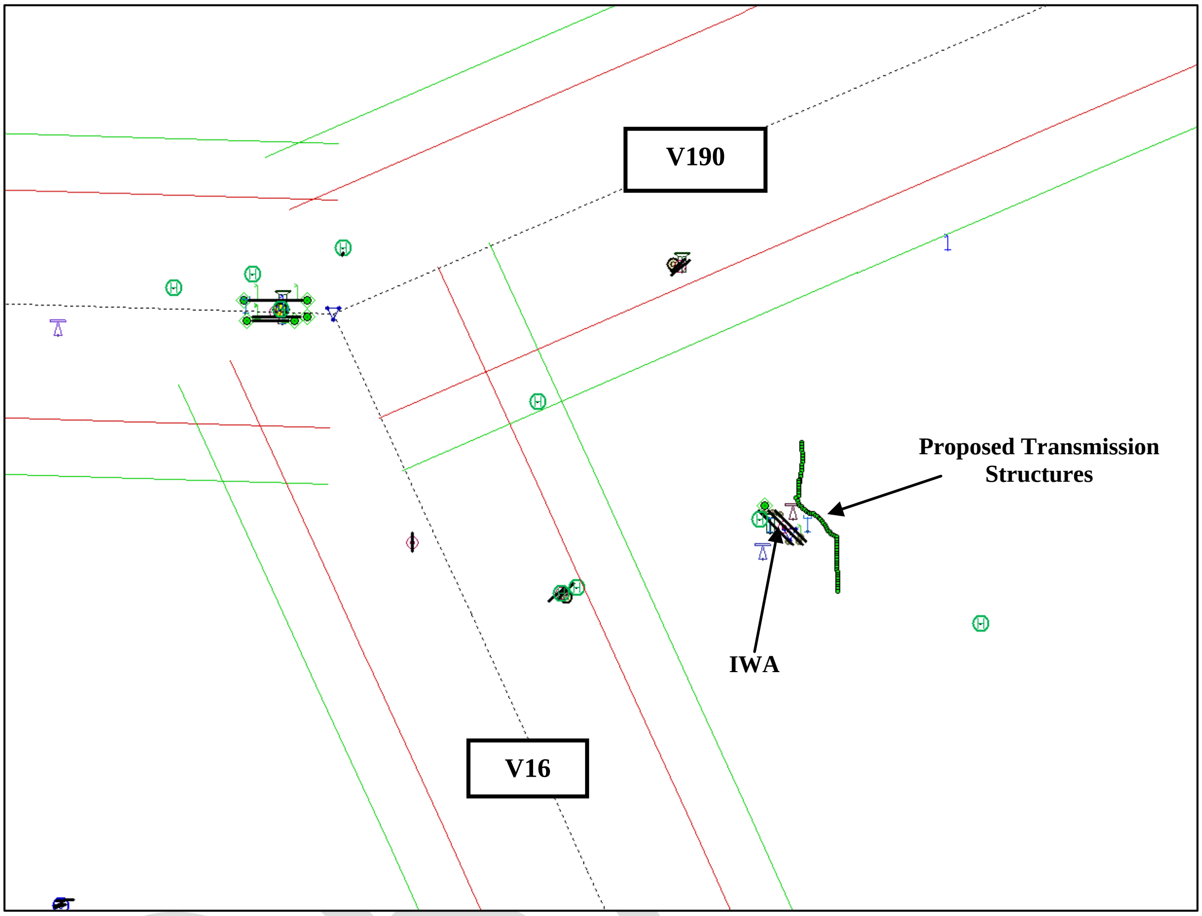


Figure 35: Impact of Low Altitude Airways to Proposed Transmission Structures

The Low Altitude Victor Airways are the imaginary routes in which aircraft travel across the country. Airways are 12 nautical miles wide. They consist of a primary area and two secondary areas. Several Airways are located near the Subject area. These are V16 and V190. The Low Altitude Airways nearest to The Project are V16 and V190. The Project will have no impact to aircraft on either of these airways.

Radio Communication Link (RCL) Propagation Path

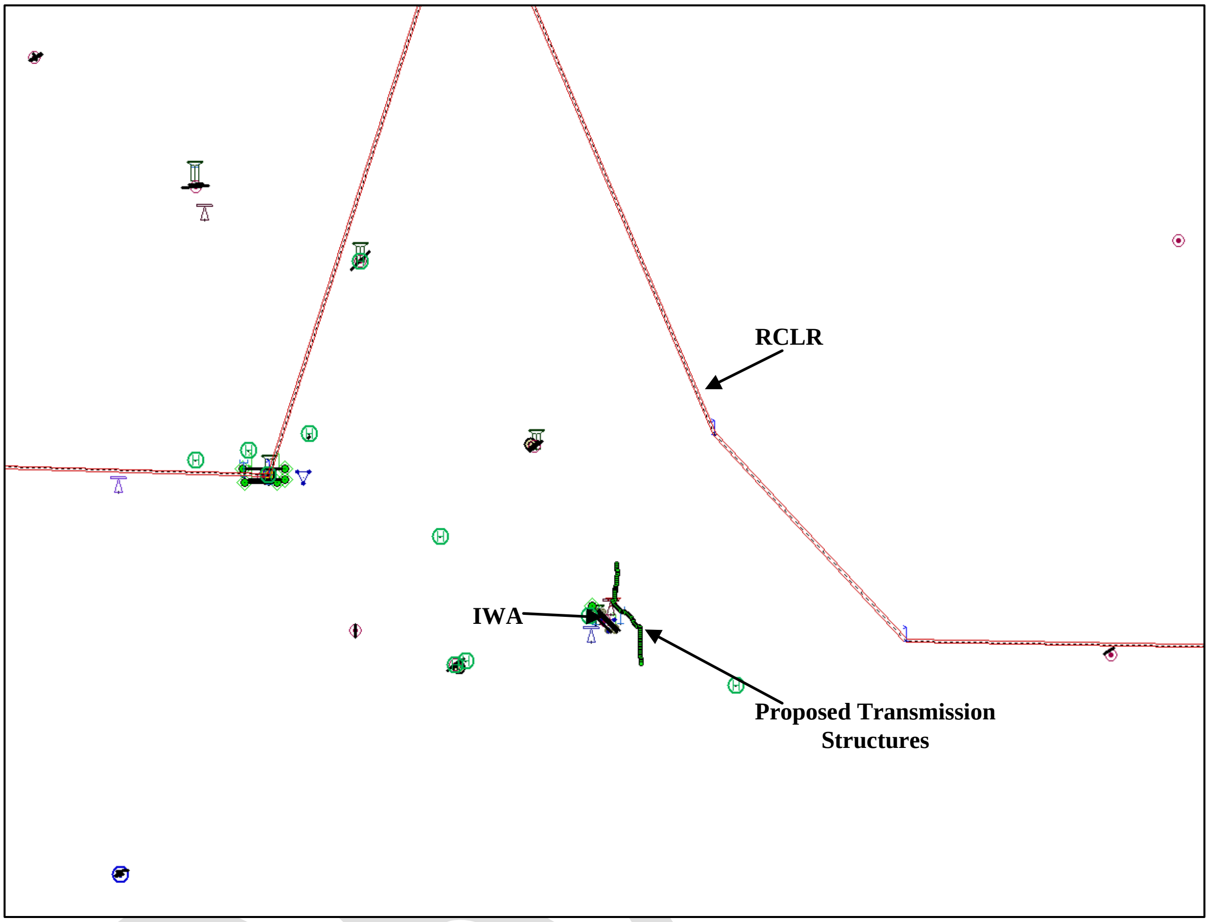


Figure 36: Radio Communication Link (RCL) Propagation Path

The line of site for an existing RCL (Radio Communication Link) Propagation Path is shown in the above Figure 36. The RCLR is located approximately 8.25 NM East of the proposed transmission line. The RCL's Fresnel Zone Notice Area, highlighted in red, is 500 feet either side of the line of site or centerline. Transmission structures to be located within this area will require notice to the FAA for further study. Structures located inside the Fresnel Zone may adversely impact the integrity of this communication link and may not be approved by the FAA. The proposed transmission structures are not located within this RCL and will have no effect upon it.

Minimum Vectoring Altitudes (MVA)

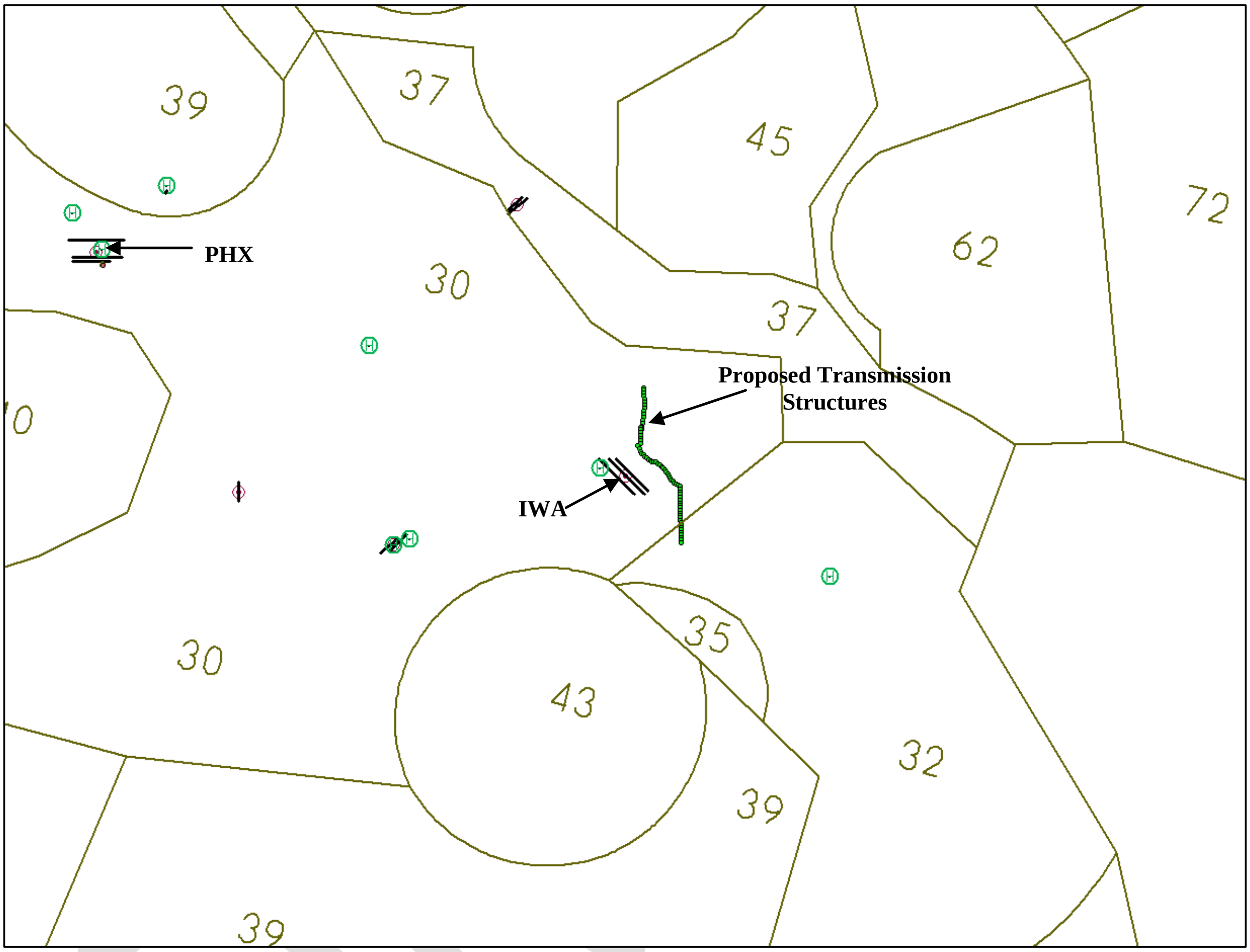


Figure 37: Impact of the Phoenix Sky Harbor (PHX) (TRACON) facility to proposed transmission structures

The proposed transmission structures are within the 16.8 to 22.3 NM operational range of the Phoenix Sky Harbor Terminal Radar Approach Control (TRACON) facility (PHX). The maximum allowable height over the proposed transmission structures is 2000 feet AMSL. Construction of proposed transmission structures will not adversely impact the IWA MVA.

RADAR Screening Analysis

National Weather Service (NWS) Radar Screening

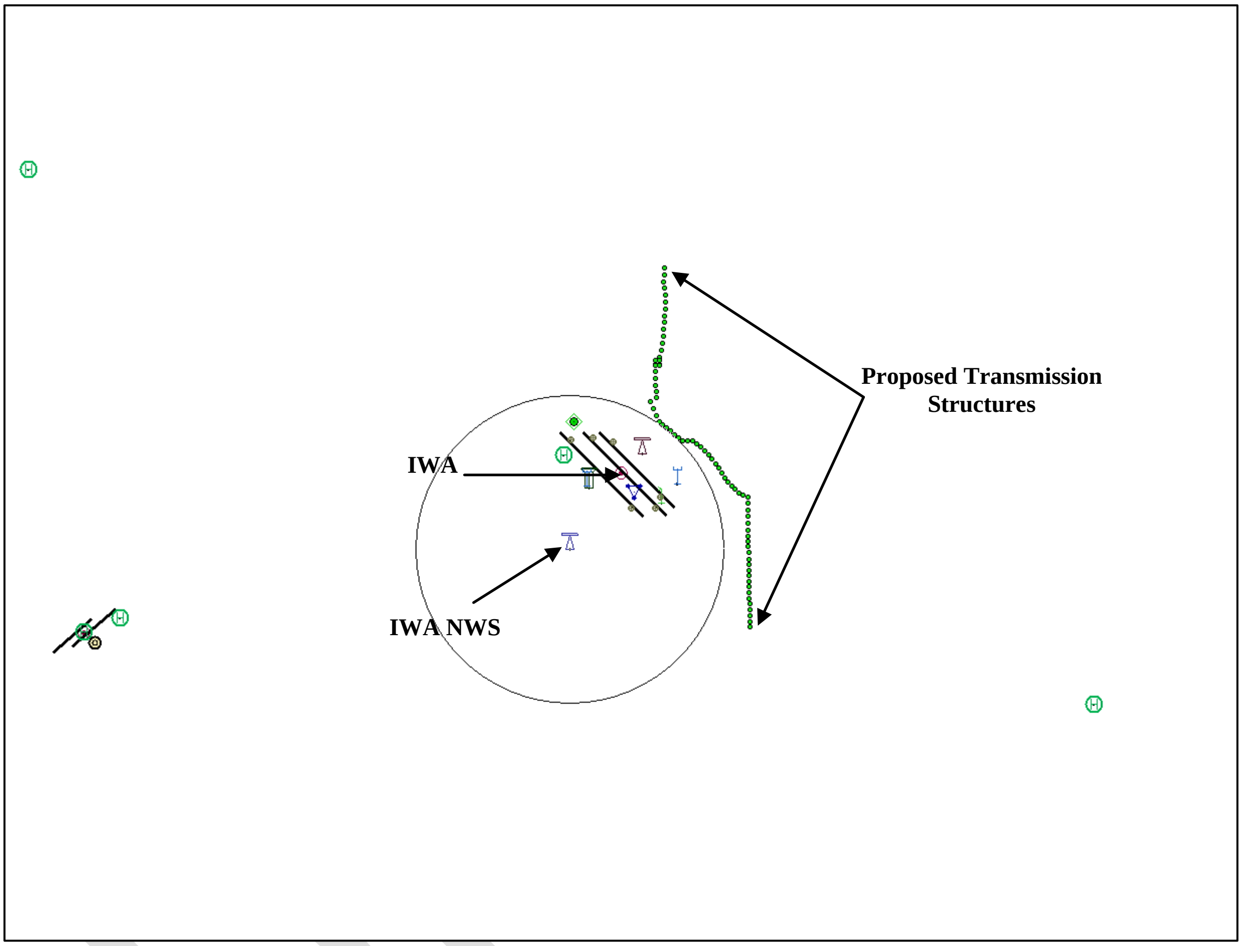


Figure 38: Impact of the IWA NWS Weather Radar to Proposed Transmission Structures

The potential impact of the proposed transmission structures to IWA National Weather Service (NWS) Weather Radar was analyzed using both the FAA/DoD Preliminary Screening Tool and FA&A's proprietary Radar Screening Tool. The IWA NWS Radar Facility is 2.28 NM from the closest proposed transmission structure. The lowest maximum allowable height over the proposed transmission structures is 1546 feet AMSL. Based upon the grazing angle of the antenna, in relation to the proposed transmission structures, there will be no significant impact upon the IWA NWS Weather Radar.

Airport Surveillance Radar (ASR) Radar Screening

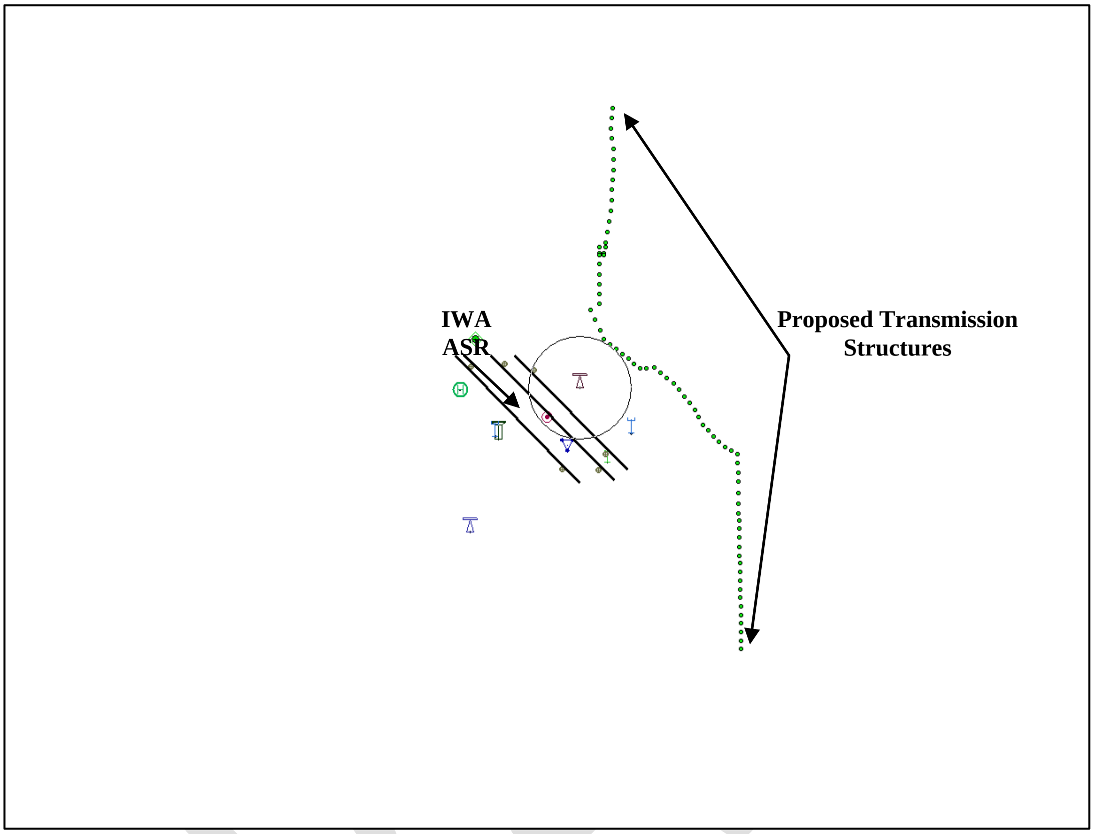


Figure 39: Impact of the Airport Surveillance Radar (ASR) to the proposed transmission structures

All structures will provide some level of shielding to the radar signal. Analysis using the Radar Equation predicts 48 structures may provide a level of shielding the FAA may find unacceptable. However, the radar equation does not account for the shielding by the mountains East and Northeast of the airport. The shielding by terrain should provide relief to the proposed structures and negate the adverse impact. More detailed information can be found in Appendix K: Supplemental EMI analysis summary.

IWA VORTAC Siting Criteria

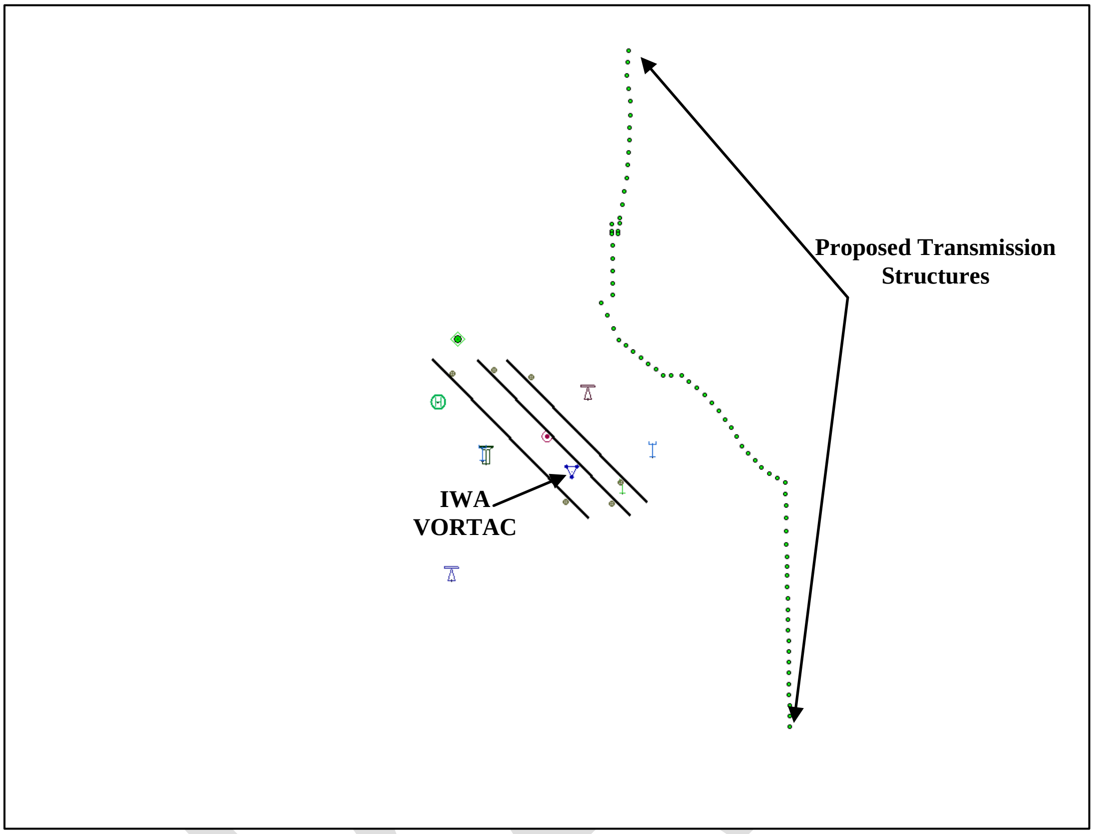


Figure 40: IWA VORTAC Siting

During our accompanying EMI analysis, we evaluated the IWA VORTAC siting criteria for potential issues. None of the proposed transmission structures will impact the IWA VORTAC. The FAA will not approve structures that will adversely affect the VORTAC at IWA. More detailed information can be found in Appendix K: Supplemental EMI analysis summary.

Conclusion

This Aeronautical Impact Statement (AIS) of the proposed transmission structures has identified all potential impacts to the Phoenix-Mesa Gateway Airport (IWA) and the Phoenix-Mesa Gateway Airport (IWA).

Notice Criteria

Seventy-Four (74) proposed transmission structures' overall AMSL height and distance to the nearest airport exceed Title 14 CFR Part 77.9(b):

- Any construction or alteration that exceeds an imaginary surface extending outward and upward at 100:1 for 20,000 feet.

A FAA 7460-1 form for each structure should be filed at least 45 days prior to the start of construction. The height to avoid notice for each structure location can be found in the attached Salt River Project supplemental APS results sheet.

TERPS Criteria

Thirty-Four (34) structures will exceed the IWA RWY 30C VNAV Approach Procedure.

Typically, this type of penetration would receive a hazard determination by the FAA. However, these structures are located within and existing utility corridor and could gain FAA approval after completion of a Public Circularization period and extended FAA study. The FAA will not put structures penetrating this surface out for public circularization unless airport support for modification of this procedure is gained.

Forty-Eight (48) proposed transmission structures will exceed the IWA Airport Surveillance Radar (ASR) minimum EMI height criteria.

There is a potential for interference among these structures. The FAA will likely issue Notices of Presumed Hazard citing the ASR Shielding impact. Once we receive Notices of Presumed Hazard for these structures we can determine the true impact of the structures to the ASR and request that the FAA studies the project utilizing the exact parameters of the IWA ASR, including terrain and shielding. Detailed information can be found in supplemental EMI analysis.

Recommendations

Thirty-Four (34) of the proposed structures will exceed the Final and Missed Approach segments of the IWA Runway 30C VNAV Instrument Approach Procedure. The FAA will not put structures penetrating this surface out for public circularization unless airport support for modification of this procedure is gained. One of two outcomes will ensue once the Public Circularization process is complete: The FAA will either raise the procedure minimums or approve the proposed structures at lower heights to meet their current procedure minimums.

Forty-Eight (48) proposed transmission structures will exceed the IWA Airport Surveillance Radar (ASR) radar equation criteria. The supplemental EMI analysis provides additional detail regarding the potential for EMI interference.

To gain FAA approval of the project, a Public Circularization process and extended FAA study must be requested upon completion of the initial FAA evaluation. We recommend that FAA Notice be given a minimum of 45 business days before planned start of construction. Since the project will likely require public circularization, the FAA may require up to 120 business days prior to start of construction before issuing a final determination.

We also recommend that a FAA '1A' survey (±3 vertical, ±20' horizontal) be submitted for each transmission structure that exceeds or is within 50 feet of the maximum value in the 'FAA Obstruction Limit' column 'P' found in the Salt River Project supplemental APS Results sheet when the 7460-1 forms are filed.

Approved,

James Walker
Digitally signed by James Walker
DN: cn=James Walker, o=Federal Airways and Airspace, ou=Airspace Technician, email=james.walker@airspaceusa.com, c=US
Date: 2018.07.25 13:16:13 -04'00'

James P. Walker
Airspace Specialist
Federal Airways & Airspace

Clyde Pittman
Digitally signed by Clyde Pittman
DN: cn=Clyde Pittman, o=Federal Airways and Airspace, ou=Director of Engineering, email=airspace@airspaceusa.com, c=US
Date: 2018.07.25 13:16:34 -04'00'

Clyde J. Pittman
Director of Engineering
Federal Airways & Airspace

Appendix

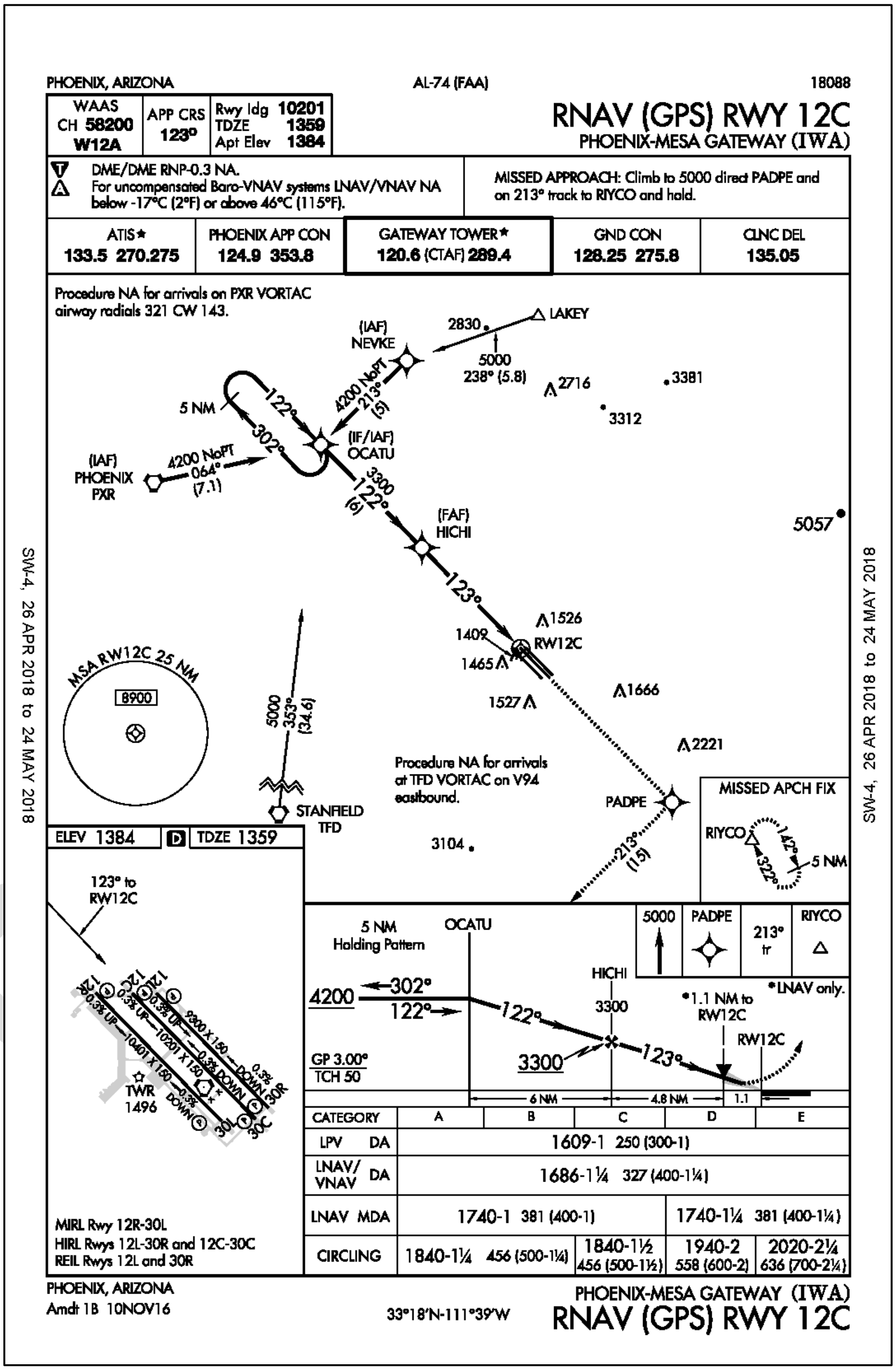
Appendix A: Transmission Line Structure Parameters

APS Number	Site ID	Latitude (N)	Longitude (W)	Site Elevation (ft)	Structure AGL (ft)	Overall AMSL (ft)
2018-APS-1945-OE	1	33°21'27.565"	111°38'33.717"	1400	122	1522
2018-APS-1946-OE	2	33°21'21.958"	111°38'34.199"	1397	123	1520
2018-APS-1947-OE	3	33°21'15.813"	111°38'34.727"	1394	118	1512
2018-APS-1948-OE	4	33°21'09.928"	111°38'33.872"	1394	118	1512
2018-APS-1949-OE	5	33°21'03.982"	111°38'33.009"	1392	123	1515
2018-APS-1950-OE	6	33°20'57.524"	111°38'32.644"	1391	123	1514
2018-APS-1951-OE	7	33°20'51.679"	111°38'33.079"	1391	118	1509
2018-APS-1952-OE	8	33°20'45.941"	111°38'33.506"	1390	118	1508
2018-APS-1953-OE	9	33°20'40.131"	111°38'33.938"	1391	118	1509
2018-APS-1954-OE	10	33°20'34.292"	111°38'34.373"	1389	118	1507
2018-APS-1955-OE	11	33°20'28.061"	111°38'34.836"	1386	123	1509
2018-APS-1956-OE	12	33°20'21.919"	111°38'36.094"	1385	123	1508
2018-APS-1957-OE	13	33°20'15.661"	111°38'37.376"	1382	133	1515
2018-APS-1958-OE	14	33°20'09.540"	111°38'38.63"	1381	127	1508
2018-APS-1959-OE	15	33°20'07.006"	111°38'38.731"	1380	122	1502
2018-APS-1960-OE	16	33°20'06.937"	111°38'42.916"	1379	122	1501
2018-APS-1961-OE	17	33°20'03.345"	111°38'42.928"	1378	122	1500
2018-APS-1962-OE	18	33°20'03.338"	111°38'39.49"	1380	122	1502
2018-APS-1963-OE	19	33°20'02.051"	111°38'39.454"	1380	122	1502
2018-APS-1964-OE	20	33°20'02.039"	111°38'42.932"	1378	122	1500
2018-APS-1965-OE	21	33°19'56.771"	111°38'42.863"	1378	118	1496
2018-APS-1966-OE	22	33°19'50.796"	111°38'42.786"	1378	123	1501
2018-APS-1967-OE	23	33°19'44.939"	111°38'42.71"	1380	128	1508
2018-APS-1968-OE	24	33°19'39.350"	111°38'42.637"	1376	133	1509
2018-APS-1969-OE	25	33°19'33.780"	111°38'42.565"	1375	147	1522
2018-APS-1970-OE	26	33°19'30.277"	111°38'48.764"	1372	152	1524
2018-APS-1971-OE	27	33°19'24.343"	111°38'45.529"	1373	133	1506
2018-APS-1972-OE	28	33°19'18.231"	111°38'42.197"	1373	128	1501
2018-APS-1973-OE	29	33°19'13.059"	111°38'39.378"	1373	127	1500
2018-APS-1974-OE	30	33°19'10.388"	111°38'35.399"	1376	118	1494
2018-APS-1975-OE	31	33°19'07.609"	111°38'31.259"	1376	118	1494
2018-APS-1976-OE	32	33°19'04.710"	111°38'26.941"	1379	108	1487
2018-APS-1977-OE	33	33°19'01.917"	111°38'22.781"	1380	108	1488
2018-APS-1978-OE	34	33°18'59.095"	111°38'18.577"	1382	113	1495
2018-APS-1979-OE	35	33°18'56.401"	111°38'14.565"	1384	117	1501
2018-APS-1980-OE	36	33°18'56.475"	111°38'10.067"	1386	118	1504
2018-APS-1981-OE	37	33°18'56.566"	111°38'04.559"	1387	122	1509

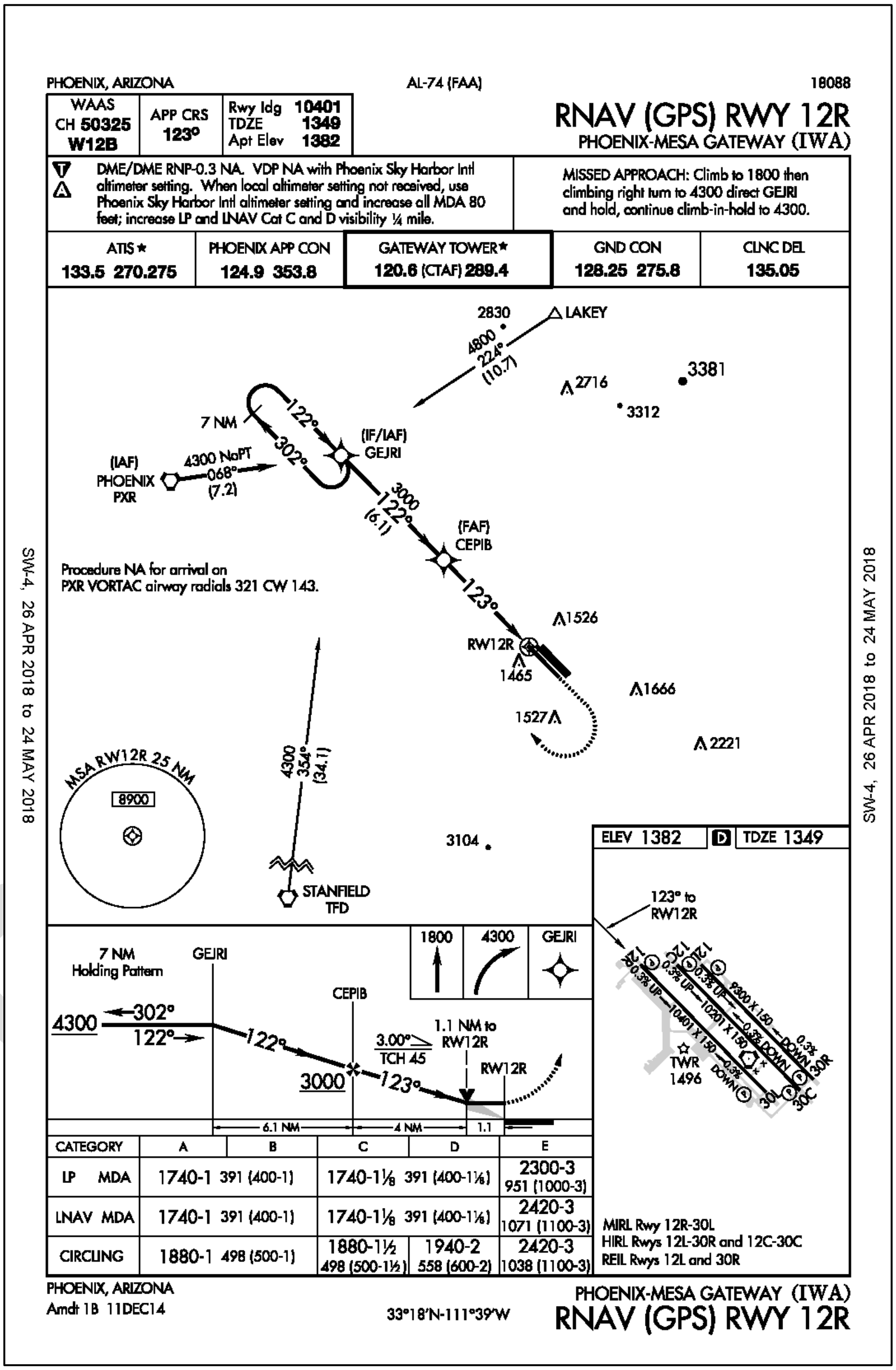
Appendix A: Transmission Line Structure Parameters Cont.

APS Number	Site ID	Latitude (N)	Longitude (W)	Site Elevation (ft)	Structure AGL (ft)	Overall AMSL (ft)
2018-APS-1982-OE	38	33°18'53.634"	111°38'00.343"	1389	113	1502
2018-APS-1983-OE	39	33°18'50.558"	111°37'55.923"	1390	113	1503
2018-APS-1984-OE	40	33°18'47.427"	111°37'51.422"	1391	113	1504
2018-APS-1985-OE	41	33°18'43.721"	111°37'47.726"	1392	113	1505
2018-APS-1986-OE	42	33°18'39.941"	111°37'43.957"	1393	113	1506
2018-APS-1987-OE	43	33°18'35.998"	111°37'40.408"	1393	118	1511
2018-APS-1988-OE	44	33°18'32.065"	111°37'36.869"	1394	113	1507
2018-APS-1989-OE	45	33°18'27.833"	111°37'33.958"	1394	118	1512
2018-APS-1990-OE	46	33°18'23.587"	111°37'31.037"	1394	113	1507
2018-APS-1991-OE	47	33°18'20.016"	111°37'27.458"	1395	113	1508
2018-APS-1992-OE	48	33°18'16.795"	111°37'23.781"	1396	113	1509
2018-APS-1993-OE	49	33°18'13.621"	111°37'20.251"	1398	113	1511
2018-APS-1994-OE	50	33°18'10.593"	111°37'15.914"	1399	113	1512
2018-APS-1995-OE	51	33°18'08.556"	111°37'11.366"	1400	118	1518
2018-APS-1996-OE	52	33°18'06.627"	111°37'07.058"	1401	122	1523
2018-APS-1997-OE	53	33°18'01.318"	111°37'06.932"	1400	128	1528
2018-APS-1998-OE	54	33°17'55.771"	111°37'06.801"	1402	128	1530
2018-APS-1999-OE	55	33°17'50.186"	111°37'06.668"	1400	128	1528
2018-APS-2000-OE	56	33°17'43.929"	111°37'06.520"	1400	128	1528
2018-APS-2001-OE	57	33°17'37.784"	111°37'06.374"	1400	123	1523
2018-APS-2002-OE	58	33°17'32.004"	111°37'06.237"	1402	118	1520
2018-APS-2003-OE	59	33°17'27.620"	111°37'06.134"	1402	103	1505
2018-APS-2004-OE	60	33°17'23.294"	111°37'06.031"	1402	113	1515
2018-APS-2005-OE	61	33°17'17.953"	111°37'05.904"	1404	118	1522
2018-APS-2006-OE	62	33°17'12.496"	111°37'05.775"	1404	118	1522
2018-APS-2007-OE	63	33°17'07.378"	111°37'05.654"	1405	108	1513
2018-APS-2008-OE	64	33°17'02.866"	111°37'05.547"	1405	108	1513
2018-APS-2009-OE	65	33°16'57.847"	111°37'05.428"	1407	113	1520
2018-APS-2010-OE	66	33°16'52.881"	111°37'05.310"	1409	118	1527
2018-APS-2011-OE	67	33°16'47.900"	111°37'05.192"	1408	123	1531
2018-APS-2012-OE	68	33°16'42.893"	111°37'05.073"	1408	123	1531
2018-APS-2013-OE	69	33°16'37.897"	111°37'04.979"	1410	118	1528
2018-APS-2014-OE	70	33°16'32.901"	111°37'04.922"	1411	118	1529
2018-APS-2015-OE	71	33°16'27.868"	111°37'04.865"	1412	118	1530
2018-APS-2016-OE	72	33°16'22.805"	111°37'04.807"	1413	118	1531
2018-APS-2017-OE	73	33°16'17.728"	111°37'04.749"	1413	118	1531
2018-APS-2018-OE	74	33°16'13.180"	111°37'04.698"	1414	117	1531

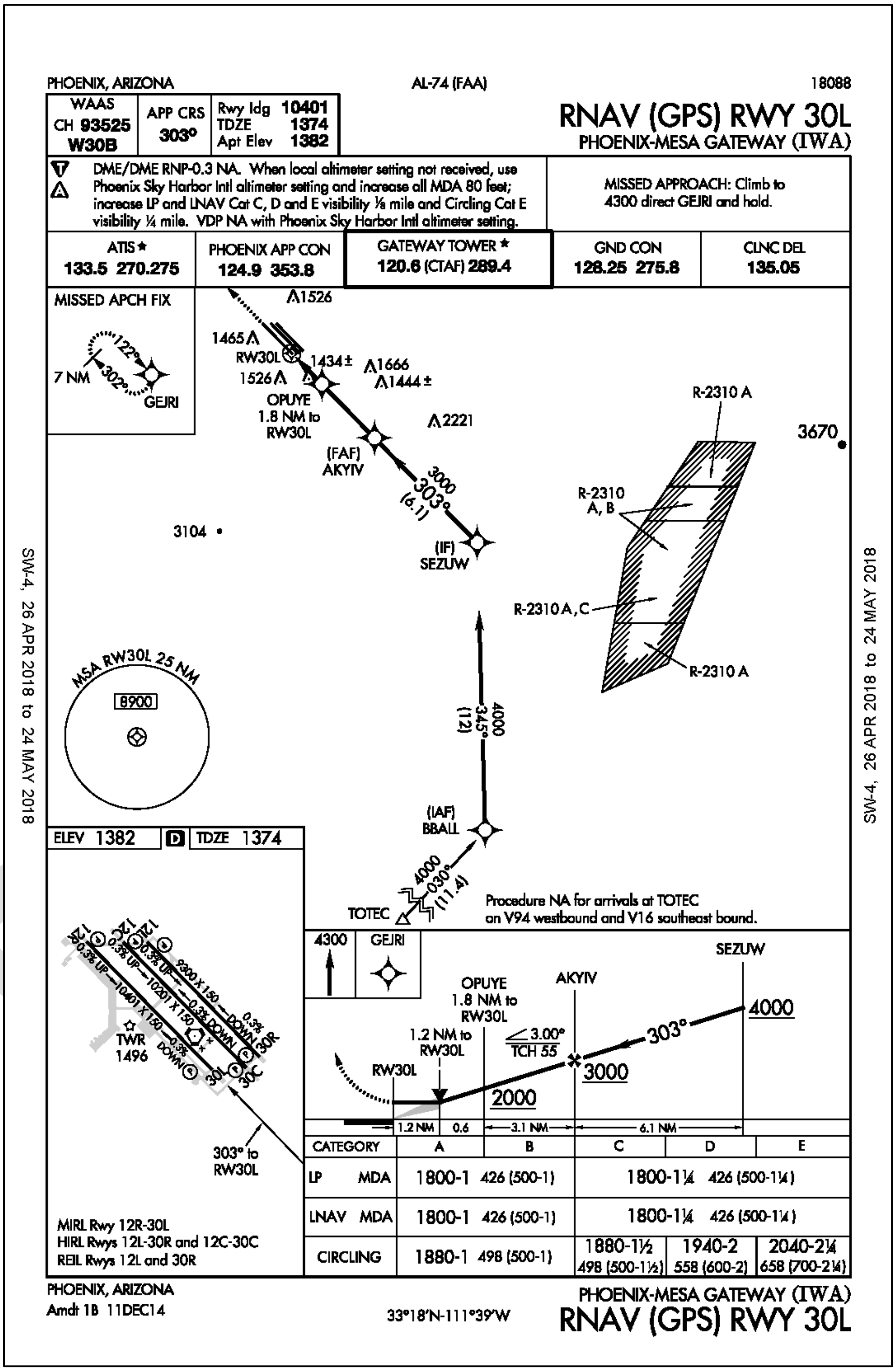
Appendix B: IWA RNAV (GPS) RWY 12C Approach Plate



Appendix C: IWA RNAV (GPS) RWY 12R Approach Plate

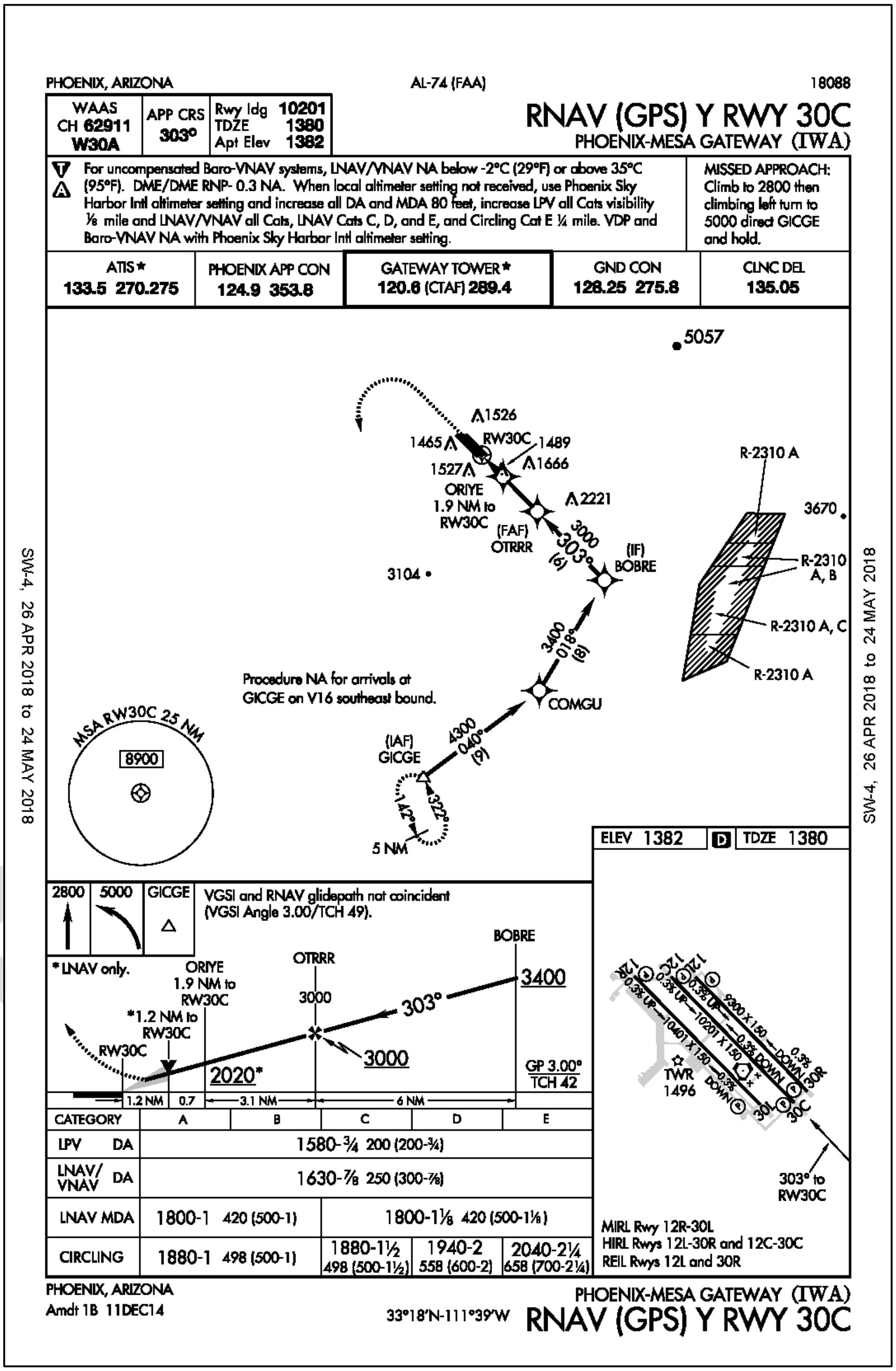


Appendix D: IWA RNAV (GPS) RWY 30L Approach Plate



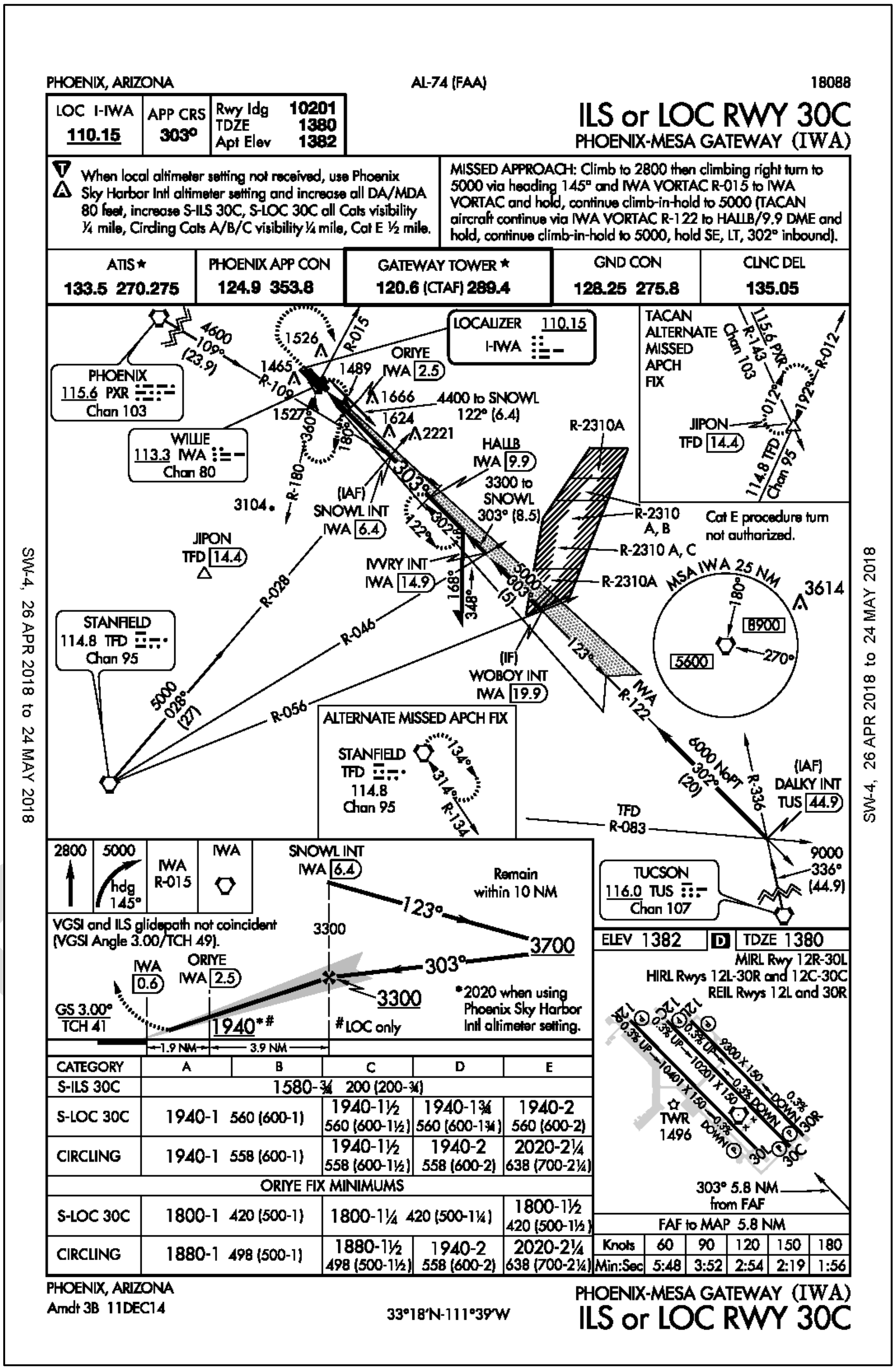
CATEGORY	A	B	C	D	E
LP MDA	1800-1 426 (500-1)		1800-1¼ 426 (500-1¼)		
LNAV MDA	1800-1 426 (500-1)		1800-1¼ 426 (500-1¼)		
CIRCLING	1880-1 498 (500-1)		1880-1½ 498 (500-1½)	1940-2 558 (600-2)	2040-2¼ 658 (700-2¼)

Appendix E: IWA RNAV (GPS) RWY 30C Approach Plate



CATEGORY	A	B	C	D	E
LPV DA	1580-¾ 200 (200-¾)				
LNAV/VNAV DA	1630-⅞ 250 (300-⅞)				
LNAV MDA	1800-1 420 (500-1)		1800-1⅛ 420 (500-1⅛)		
CIRCLING	1880-1 498 (500-1)		1880-1½ 498 (500-1½)	1940-2 558 (600-2)	2040-2¼ 658 (700-2¼)

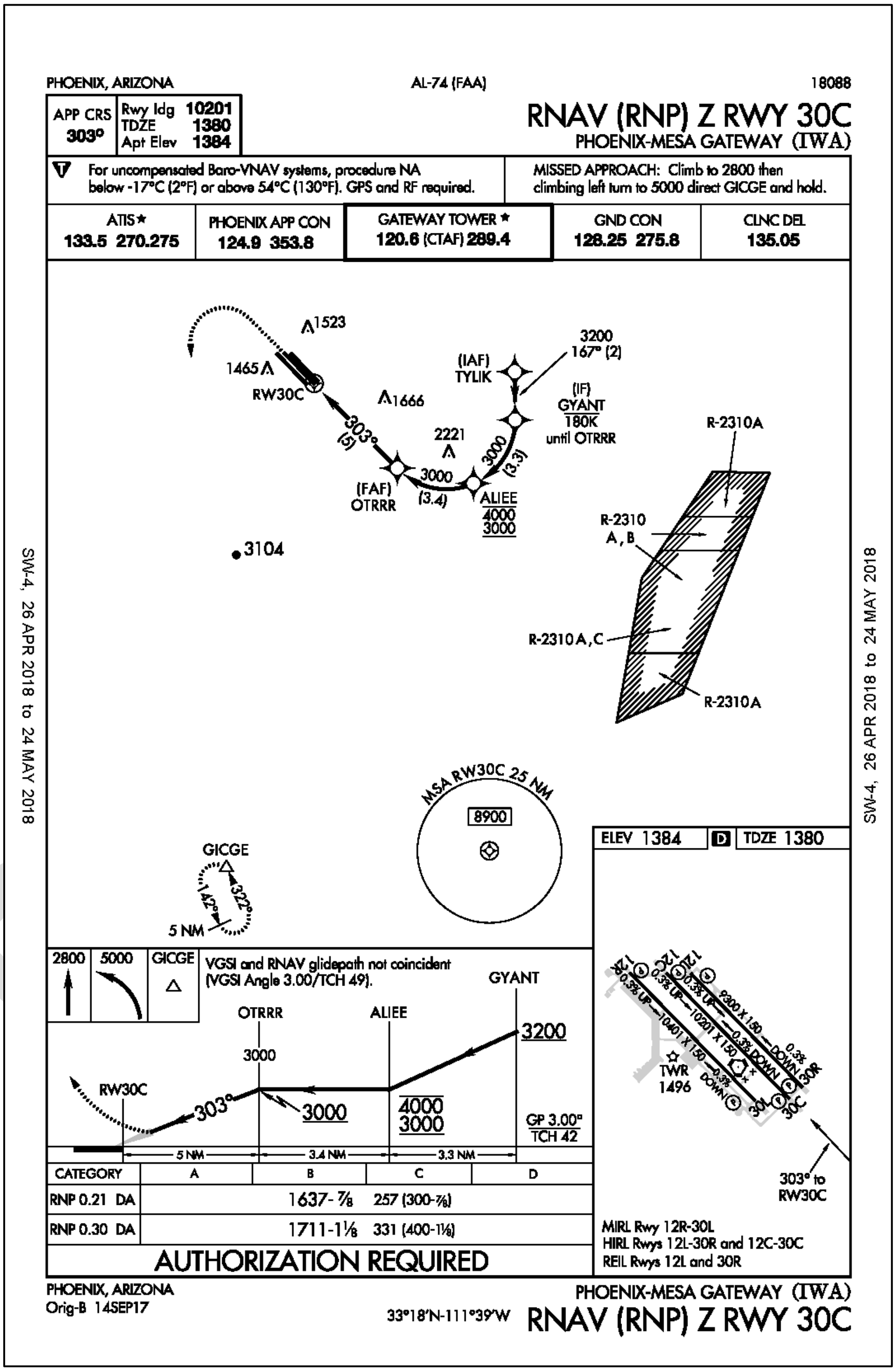
Appendix F: IWA ILS RWY 30C Approach Plate



CATEGORY	A	B	C	D	E
S-ILS 30C	1580-¾ 200 (200-¾)				
S-LOC 30C	1940-1 560 (600-1)		1940-1½ 560 (600-1½)	1940-1¾ 560 (600-1¾)	1940-2 560 (600-2)
CIRCLING	1940-1 558 (600-1)		1940-1½ 558 (600-1½)	1940-2 558 (600-2)	2020-2¼ 638 (700-2¼)
ORIYE FIX MINIMUMS					
S-LOC 30C	1800-1 420 (500-1)		1800-1¼ 420 (500-1¼)		1800-1½ 420 (500-1½)
CIRCLING	1880-1 498 (500-1)		1880-1½ 498 (500-1½)	1940-2 558 (600-2)	2020-2¼ 638 (700-2¼)

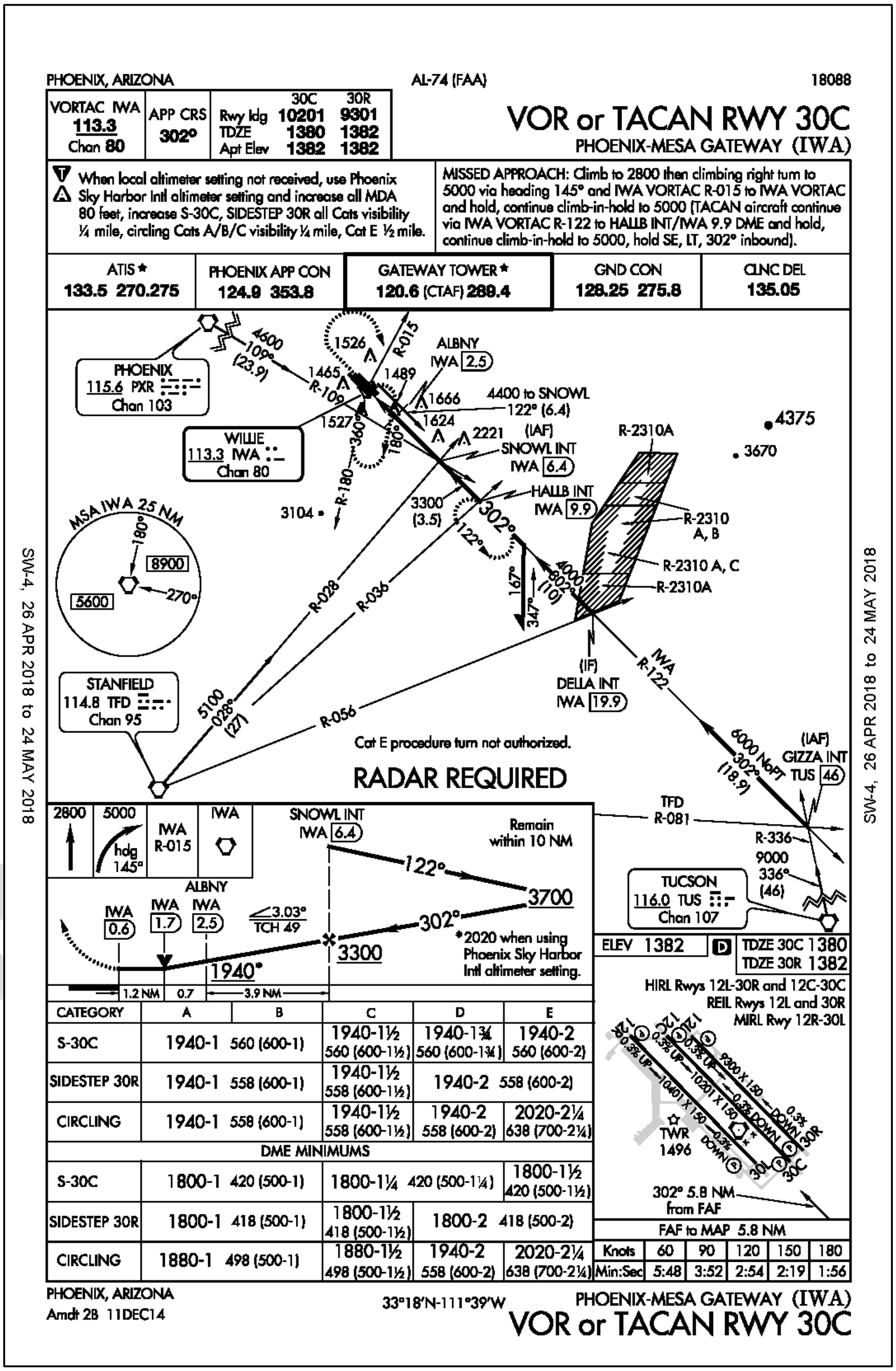
Knots	60	90	120	150	180
Min:Sec	5:48	3:52	2:54	2:19	1:56

Appendix G: IWA RNAV (RNP) Z RWY 30C Approach Plate



CATEGORY	A	B	C	D
RNP 0.21 DA	1637-7/8 257 (300-7/8)			
RNP 0.30 DA	1711-1 1/8 331 (400-1 1/8)			

Appendix H: IWA VOR or TACAN RWY 30C Approach Plate



Appendix I: IWA RNAV Departure Procedures

L15

TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)

18088

26 APR 2018 to 24 MAY 2018

PHOENIX, AZ (CON'T)
PHOENIX-MESA GATEWAY (IWA)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 1 10042 (FAA)
DEPARTURE PROCEDURE: use PHOENIX DEPARTURE.

DIVERSE VECTOR AREA (RADAR VECTORS)
AMDT 1 15232 (FAA)
Rwy 12L, 12C, 12R, as assigned by ATC; requires minimum climb of 250' per NM to 3100. **Rwy 30L, 30C, 30R**, heading as assigned by ATC.

PRESCOTT, AZ
ERNEST A LOVE FIELD (PRC)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 4 14093 (FAA)
DEPARTURE PROCEDURE: Use PRESCOTT DEPARTURE.

DIVERSE VECTOR AREA (RADAR VECTORS)
ORIG 16007 (FAA)
Rwy 3L/R, Heading as assigned by ATC. **Rwy 12,** Heading as assigned by ATC; requires minimum climb of 370' per NM to 7700. **Rwy 21L/R** Heading as assigned by ATC; requires minimum climb of 390' per NM to 8300. **Rwy 30,** Heading as assigned by ATC.

PRICE, UT
CARBON COUNTY RGNL/BUCK DAVIS FIELD (PUC)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 5 15064 (FAA)
TAKEOFF MINIMUMS: **Rwy 1**, std. w/min. climb of 400' per NM to 6800 or 3300-3 for climb in visual conditions. **Rwy 8**, NA - obstacles. **Rwy 33**, std. w/min. climb of 370' per NM to 6700 or 3300-3 for climb in visual conditions.
DEPARTURE PROCEDURE: **Rwy 1,** climb to 6400 then climbing right turn on a heading between 144° CW to 187°, maintain 210 KIAS until completion of turn, thence . . .
Rwy 15, climb on a heading between 129° CW to 196°, thence . . .
Rwy 19, climb on a heading between 195° CCW to 128°, thence . . .
Rwy 26, climb on a heading between 179° CCW to 127°, thence . . .
Rwy 33, climb to 6300 then climbing left turn on a heading between 178° CCW to 148°, thence . . .
. . . continue climb to assigned altitude for direction of flight.
VCOA: **Rwys 1, 33,** obtain ATC approval for climb in visual conditions when requesting IFR clearance. Climb in visual conditions to cross Carbon County RGNL airport/Buck Davis Field at or above 9100 before proceeding on course.
TAKEOFF OBSTACLE NOTES: **Rwy 1,** multiple trees and poles beginning 164' from DER, left and right of centerline, up to 64' AGL/6207' MSL.

PROVO, UT
PROVO MUNI (PVU)
DEPARTURE PROCEDURE: Use PROVO DEPARTURE.

RENO, NV
RENO/STEAD (RTS)
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES
AMDT 3A 09183 (FAA)
TAKEOFF MINIMUMS: CAT A,B only, CAT C,D NA. **Rwys 8, 14,** 1300-2 or std. with a min. climb of 400' per NM to 6500. **Rwy 26,** 1900-2 or std. with a min. climb of 410' per NM to 7200. **Rwy 32,** 2300-2 or std. with a min. climb of 420' per NM to 7200.
DEPARTURE PROCEDURE: **Rwys 8, 32,** climbing right turn heading 100° and FMG VORTAC R-314 to FMG VORTAC. **Rwy 14,** left turn climb direct FMG VORTAC. **Rwy 26,** climbing right turn heading 050° and FMG VORTAC R-314 to FMG VORTAC. **All aircraft climb in** FMG VORTAC holding pattern (NE, right turns, 221° inbound) to depart FMG VORTAC: R-260 CW R-170 at or above 10000; R-171 CW R-195 at or above 10500; R-196 CW R-259 at or above 12000.

26 APR 2018 to 24 MAY 2018

TAKEOFF MINIMUMS, (OBSTACLE) DEPARTURE PROCEDURES, AND DIVERSE VECTOR AREA (RADAR VECTORS)

18088 L15 SW-4

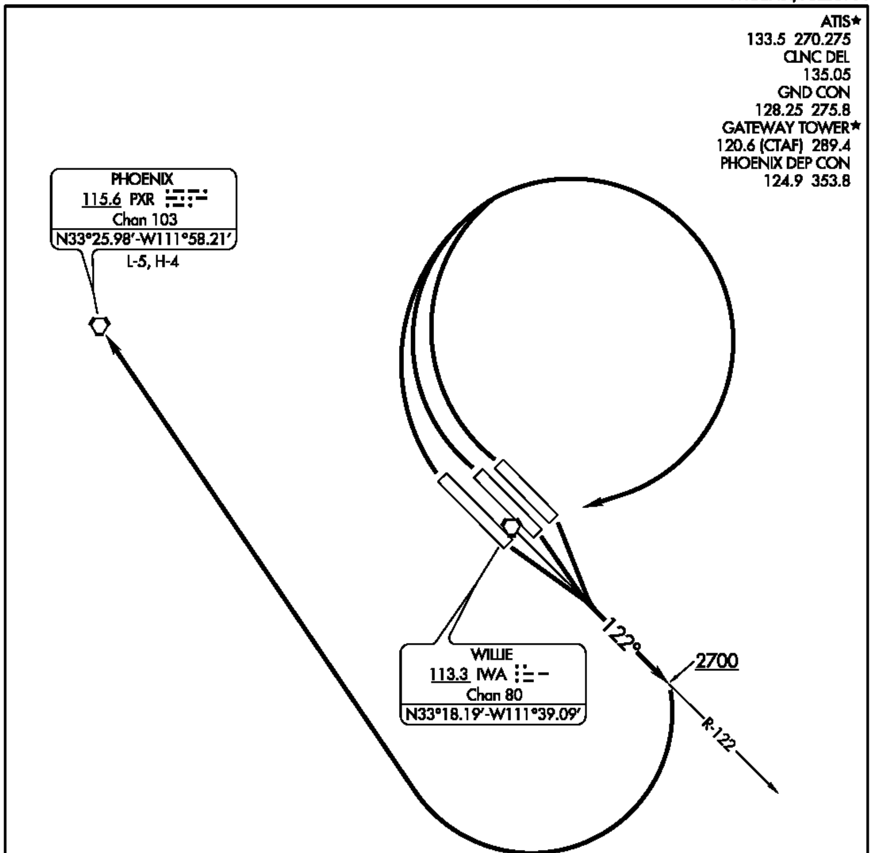
Appendix J: IWA Phoenix One Departure Procedures

(PXR1.PXR) 18088

PHOENIX ONE DEPARTURE (OBSTACLE) AL-74 (FAA)

PHOENIX-MESA GATEWAY (IWA)
PHOENIX, ARIZONA

SW-4, 24 MAY 2018 to 21 JUN 2018



TAKEOFF MINIMUMS

Rwys 12L, 12C, 12R, 30L, 30C, 30R: Standard.

TAKEOFF OBSTACLE NOTES

Rwys 30L/C/R: Trees beginning 351' from DER, 351' left of centerline, up to 20' AGL/1359' MSL.
Trees beginning 689' from DER, 398' right of centerline, up to 20' AGL/1359' MSL.

NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAYS 12L/C/R: Climb to 2700 via IWA VORTAC R-122 then right turn direct PXR VORTAC.

TAKEOFF RUNWAYS 30L/C/R: Climbing right turn to 4000 direct IWA VORTAC and IWA VORTAC R-122 then right turn direct PXR VORTAC.

PHOENIX ONE DEPARTURE (OBSTACLE)
(PXR1.PXR) 11FEB10

PHOENIX, ARIZONA
PHOENIX-MESA GATEWAY (IWA)

SW-4, 24 MAY 2018 to 21 JUN 2018

Appendix K: EMI Analysis Summary

Air Navigation Feasibility Study

26 June 2018 Ref No. 2018-AIS-1420-OE

Salt River Project
Thomas Novy
P.O. Box 52025
Phoenix, AZ 85072-2025

Re: *Southeast Power Link - EMI Analysis Summary*

Federal Airways & Airspace has completed its preliminary EMI Analysis for the Southeast Power Link Project located in Phoenix, Arizona. The project is near the Phoenix- Mesa Gateway (IWA) Airport and has the potential to impact the nearby IWA ASR and IWA VORTAC. This analysis will summarize the potential impacts and potential mitigation strategies.

IWA VORTAC

A VOR is a navigational aid that operates in the very high frequency (VHF) band of the radio spectrum and ideally radiates uniformly in azimuth. Specifically, this facility operates between 108 MHz and 118 MHz and provides azimuth guidance to a pilot in the form of a visual display. There are two general types of VOR systems being used by the FAA, a Doppler VOR and a conventional VOR. The IWA VOR is a conventional type VOR. Additional equipment has been added to this VOR for it to provide directional azimuth information for the military. This type of equipment is called a TACAN and it operates in the Ultra High Frequency (UHF) band. The combination of the two types of equipment makes the facility a VORTAC. Included for both systems is a Distance Measuring Equipment which provides pilots with a distance to the VORTAC at any azimuth. The siting of a VOR type facility is critical to provide guidance to airports within 30 nautical miles of the facility. This facility already has coverage problems in multiple directions between 20 and 30NM away. It is unusable in most directions below 7500 feet AMSL at these distances.

The horizontally polarized VOR signals are very susceptible to interfering lateral multipath reflection from power lines. One critical factor to reducing multipath reflection is to locate the power line no closer than 1200 feet to a VOR facility. In addition, power lines, located with 2 nautical miles of the VOR, may still cause multipath reflection depending upon the height of the lines with respect to the VOR facility.

Calculation of the siting criteria critical angle has determined that none of the proposed transmission structures will exceed the IWA VORTAC.

IWA ASR False Target Potential

Phoenix, like many large cities, has numerous tall buildings. Many of these buildings do cause reflections and shielding of radar and beacon signals. Objects located near Air Traffic radar facilities can cause reflection. Beacon false targets are caused by beacon signal reflections near the radar site. Ideally, a radar beacon system will elicit beacon signal returns from properly equipped aircraft only when the beacon antenna is pointed directly at the aircraft. The beacon signal path in this case is termed the primary path and the beacon target will be displayed on the radar scope at the correct azimuth or bearing.

If a good RF reflector exists near the radar site and is also illuminated or “seen”, by the radar beacon RF radiation pattern of the antenna – and is also properly oriented to reflect this beacon signal to a beacon equipped aircraft the beacon signal can also reach the aircraft when the beacon antenna is pointing not to the aircraft, but to the beacon reflector. This reflection path can cause an apparently valid beacon target to appear on the radar scope, but at the azimuth or bearing of the reflection source and since the reflection path is longer than the primary path at greater range. This apparently valid beacon target, appearing on the radar display where no actual aircraft exist is called a beacon false target.

The subject poles will be “seen” by the IWA ASR facility. The orientation of the transmission poles will redirect radar signal energy from the direction the radar antenna is pointing. The structure will also shield the radar signal.

Twenty-Eight (28) of the proposed transmission structures could potentially cause False Targets to register with the IWA ASR. The actual impact of these structures is hard to predict. Airport Surveillance Radars can filter out some stationary objects and known false target reflectors. In FA&A’s experience the proposed structures would produce what is known as ground clutter on the radars, which they can typically tune the Radar to ignore. Current information (2016) indicated the IWA ASR is an ASR-8, which is an analogue system and does not possess the same capability to exclude structures as a digital radar. Filing the line closest to the ASR and receiving a FAA preliminary response would let us know the potential impacts and allow us to form arguments and mitigation strategies to ultimately gain approval of the line.

IWA ASR Shielding Analysis

The proposed transmission line was analyzed for potential ASR Shielding issues. FA&A preliminary analysis indicates that there is already significant coverage loss at 10NM and 20NM away from the radar in directions that favor the proposed transmission structures. See below image taken from the OEAAA FAA website.

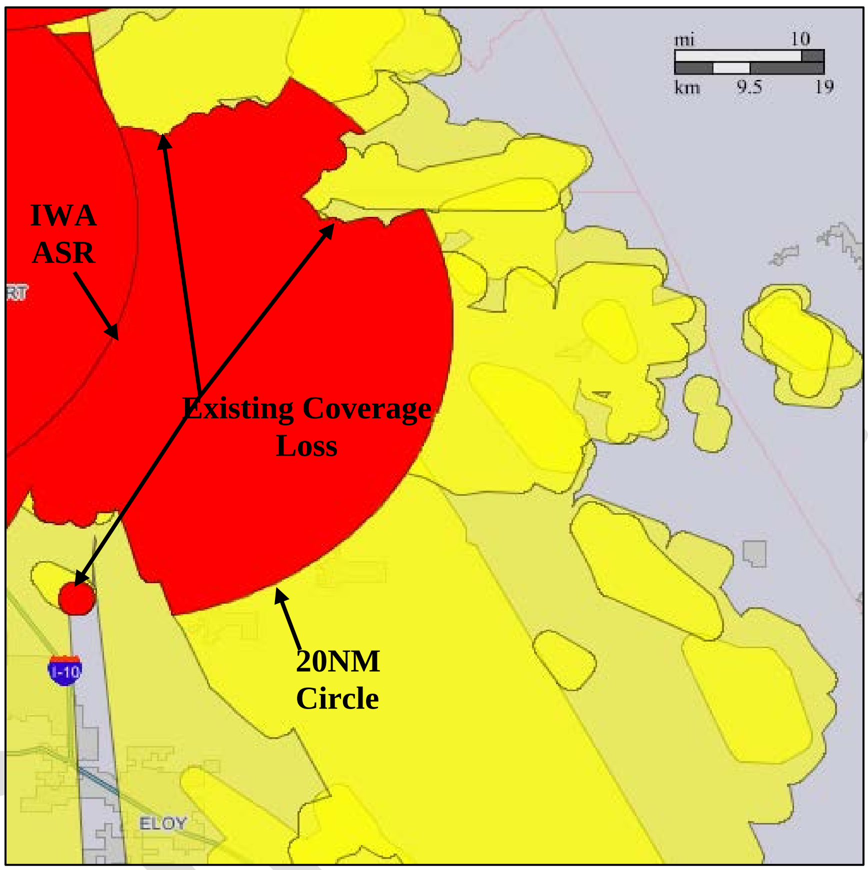


Figure 41: IWA ASR Coverage Loss Map from FAA OEAAA Website.

The proposed structures have the potential to cause further coverage loss in the areas shown in the above Figure 41. However, the transmission poles taper until their tallest point, our analysis identified only very small horizontal shielding angles which translates to minimum coverage loss between 10 and 20 NM.

The initial analysis from the FAA will likely ignore the existing coverage loss caused by the mountain ranges to the North, Northeast, and South. It will strictly focus on the proposed transmission structures and loss incurred by them alone. As such, we will build a case for approval centered around the existing coverage loss caused by the mountain ranges. To build this case, we need to receive a preliminary answer from the FAA to be able to discern the exact parameters utilized by this ASR. There are several options for mitigation that can be explored, including entering into a reimbursable agreement with the airport to upgrade or raise this ASR system, thus mitigating the shielding effects.

Recommendations

The proposed transmission structures have the potential to cause False Targets to register with the IWA Airport Surveillance Radar (ASR). The actual configuration of this ASR cannot be determined until results of a preliminary FAA study are received. Once these have been received we can provide additional analysis with mitigation options and alternate route suggestions for the proposed structures.

The proposed transmission structures will likely be flagged for ASR Shielding issues upon completion of a preliminary FAA study. The initial study will not factor in the local environmental issues and only focus on the proposed structures. The IWA ASR has multiple large areas of coverage loss at the 20NM range. It is likely that the coverage loss caused by the proposed structures will not be significant when compared to the existing coverage loss. When we receive the initial FAA results we will be able to formulate arguments for approval based upon the existing radar coverage loss areas.

Additionally, the Phoenix-Mesa Gateway Airport (IWA) has indicated to Salt River Project that the ASR-8 has a plan on file to be relocated once they begin work on their new terminal areas. While this move is not soon, once accomplished, the proposed transmission line will have little to no effect on the relocated ASR. As SRP plans on constructing this line in the next 3 to 5 years, it is likely that repositioning of the ASR is scheduled and possibly in process by this time. Federal Airways and Airspace recommends filing the transmission line with the FAA. Once we receive the initial FAA Notices of Presumed Hazard we will request public circularization of the project and submit arguments in favor of its approval. The initial NPHs will tell us how the IWA ASR is configured and allow us to form our mitigation arguments. These structures should be filed with FAA 1A Surveys. (±3 feet Vertically NAVD88 Datum and ±20 feet Horizontally NAD83 Datum).

Sincerely,

James Walker
Digitally signed by James Walker
DN: cn=James Walker, o=Federal Airways and Airspace, ou=Airspace Technician, email=james.walker@airspaceusa.com, c=US
Date: 2018.07.25 13:15:21 -04'00'

James P. Walker
Airspace Specialist
Federal Airways & Airspace

Clyde Pittman
Digitally signed by Clyde Pittman
DN: cn=Clyde Pittman, o=Federal Airways and Airspace, ou=Director of Engineering, email=airspace@airspaceusa.com, c=US
Date: 2018.07.25 13:15:39 -04'00'

Clyde J. Pittman
Director of Engineering
Federal Airways & Airspace

Glossary of Terms & Acronyms

AGL – *Above Ground Level* – Refers to a structures height above ground level.

AMSL – *Above Mean Sea Level* – Elevation or altitude of any object relative to the average sea level.

FAR – *Federal Aviation Regulations* – Rules prescribed by the FAA that govern all aviation activities in the United States. The FAR's are part of Title 14 of the Code of Federal Regulations.

IFR – *Instrument Flight Rules* – Flight rules used when conditions are not suitable for VFR flying.

MSL – *Mean Sea Level* – Refers to the average sea level.

MEA – *Minimum En Route Altitude* – is the lowest published altitude between radio navigation fixes that assures acceptable navigational signal coverage and meets obstacle clearance requirements (MOCA) between those fixes.

MOCA – *Minimum Obstacle Clearance Altitude* – The MOCA provides the required clearance above obstacles contained inside the obstacle clearance areas.

MVA – *Minimum Vectoring Altitudes* - The lowest MSL altitude at which an IFR aircraft will be vectored by a radar controller, except as otherwise authorized for radar approaches, departures, and missed approaches. The altitude meets IFR obstacle clearance criteria

NEXRAD - *Next Generation Radar* – A network of 160 high resolution S-Band Doppler Weather Radars.

RCL – *Radio Communications Link* – Microwave Path for radio communications

TERPS – *Terminal Instrument Procedures* – IFR procedures and procedure areas associated with an airport. TERPS can also refer to the Aeronautical CAD program produced and used by Federal Airways & Airspace.

TDWR – *Terminal Doppler Weather Radar* – Weather radar usually located near an airport.

VFR – *Visual Flight Rules* – Flights rules used in fair to excellent flying conditions and under certain limitation. See Title 14 CFR Part 91.

VOR – *VHF Omni directional Radio Range*- Short range radio navigation system using land based transmitters. VORs can be used as guidance along a route or for Instrument Approach Procedure guidance.

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