APPENDIX A
LIT VOR SITE SURVEY REPORT

CENTRAL SERVICE AREA (CSA)

LIT VOR SITING REPORT

LITTLE ROCK, ARKANSAS

PREPARED BY: SHELBY BOHMFALK
(NAVAIDS LEAD ENGINEER)

TECH OPS – NAVAIDS DESIGN GROUP
(08/24/2018)

INTRODUCTION

On August 14th and 15th, 2018, FAA Engineering Services out of Fort Worth, Texas and Garver Engineering out of Little Rock, Arkansas performed site surveys to evaluate potential locations for the relocation of the existing Little Rock, Arkansas VOR facility. A condensed VOR siting criteria listed in Section 1 of this report was used to evaluate each of the sites. A total of 5 potential site locations were surveyed. The results of these surveys and photographs of these locations are detailed in Section 2 of this report.

Attendees:

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Section 1. CONDENSED VOR SITING CRITERIA

A. Within 200 feet, no farm-type wire fences 4 feet or more in height.

B. Within 500 feet, no chain type fence 6 feet or more in height.

C. "A" and "B" restrictions may be relaxed for fences essentially radial to the antenna.

D. Power and control lines should be installed underground for a minimum of 600 feet from the antenna.

E. Overhead power and control lines should be essentially radial to the antenna for a minimum distance of 1200 feet.

F. No other lines or supporting structures should subtend a vertical angle of more than 1.5 degrees above the site.

G. Single trees of moderate height (up to 30 feet) may be tolerated beyond 500 feet. No trees should be closer than 500 feet.

H. No group of trees within 1000 feet of the site.

I. No trees should subtend a vertical angle of more than 2.0 degrees above the site.

J. No fence or lines should extend more than 0.5 degrees above the antenna.

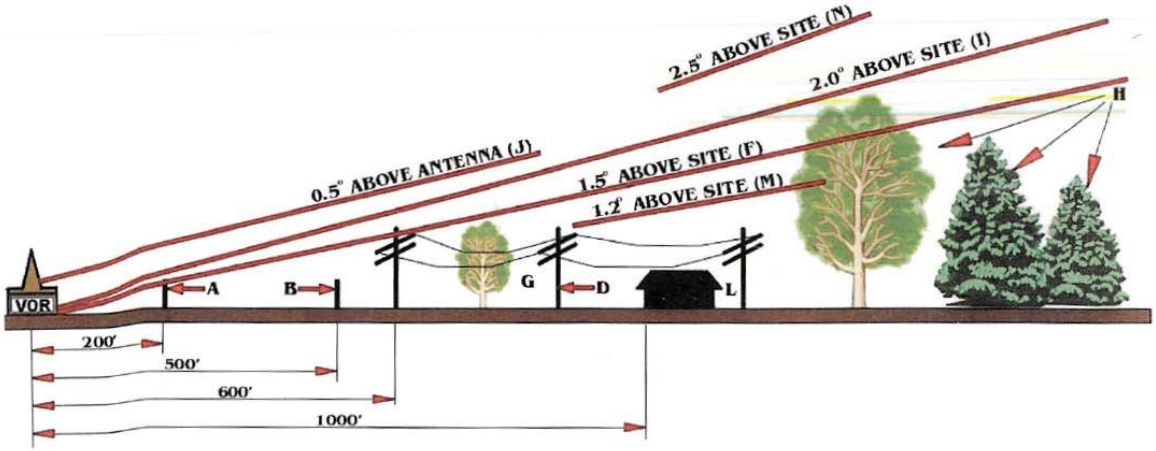
K. On airports, all buildings should be considered as if they were power and telephone lines.

L. There shall be no structures within 1000 feet of the antenna.

M. All structures that are partly or entirely metallic shall subtend vertical angles of less than 1.2 degrees.

N. Wooden structures with negligible metallic content may be tolerated below 2.5 degrees.

NOTE: Since there are many possible combinations of height and orientation of wire lines and fences with various terrain configurations, these matters will require special study by engineering personnel at each site in question to determine whether a particular situation can be expected to produce objectionable effects.



Section 1. SITE LOCATIONS

Thomas Site – Asher Road

Issues:

1. **Tree line**
   - To the North of the proposed location, the tree line penetrates the 2.0° angle specified in item I of the Condensed VOR Siting Criteria (referred to hereafter as CVSC). The tree line is thick enough to be considered impervious to the RF signal.
   - From N to SE of the proposed location, the tree line is approximately 3.0° above horizontal, penetrating the 2.5° angle specified in item N of the CVSC.
   - The tree line is approximately 2.5° above horizontal from a bearing of 274° to 350°, at times penetrating the 2.5° angle specified in item N of the CVSC.

2. **High voltage transmission lines and towers**
   - The tallest transmission tower extends to an approximate angle of 3°45' above horizontal as seen from the proposed VOR Site, penetrating the angles specified in items F, J, and M of the CVSC.
   - The second transmission tower extends above an approximate angle of 1.5° from horizontal as seen from the proposed VOR Site, penetrating the angles specified in items F and J of the CVSC.
   - The third transmission tower clears the 1.5° angle specified in item F of the CVSC by approximately 10 feet. Despite this tower slightly clearing the requirement of the order, there will likely be an impact to the RF signal.
   - High voltage transmission lines become a penetration to the angles specified in items F, J and M of the CVSC from an approximate bearing of 128°30' from North through 145°10'.
   - Transmission tower guy wires become a penetration to the angles specified in items F, J and M of the CVSC from an approximate bearing of 117°41' from North through 161°08'.

3. **Environmental concerns**
   - The irrigation channel through the property appears to have been treated with herbicides and/or pesticides. Soil testing will need to be performed to identify potential contamination. Civil work needed to fill the irrigation channel will likely require coordination with USACE due to proximity to levee. Potential tree topping or removal will require coordination with USFWS regarding impact to wildlife.

4. **Power availability**
   - Single phase power is located within approximately 0.7 mile, 3 phase power greater than a mile per email from Entergy.

5. **Electronics evaluation**
   - There are large metal towers connected with high tension power lines that disqualify this site. No math modeling should be performed on this site.

Thomas Site

Ginhouse Lake Site – Craig Road

Issues:

1. **Tree line**
   - There is solid tree cover penetrating the 2° angle specified in item I of the CVSC from an approximate bearing of 53°30' to 152°05' and from 214°30' to 235°55'. The tallest tree is at an angle of 3°10' from horizontal measured from the proposed VOR site. These trees may need to be cut back if they negatively impact the mobile VOR test. We do not anticipate them having significant impact on the operation of the end state Doppler VOR.

2. **Overhead power lines**
   - Within 1,200 feet of the proposed VOR site there are power lines overhead running tangent to the edge of the VOR critical area. Per items E and J of the CVSC, these overhead power lines will need to be relocated below grade. The closest power pole is at 1,148 feet from the proposed VOR Plot.

3. **Rotating irrigation pivot**
   - The rotating Irrigation pivot on the adjoining field is 1,634 feet from the VOR Antenna location. The entire horizontal span of the pivot is within the 0.5° angle specified in item J of the CVSC from an approximate bearing of 295°25' through 328°20'. The irrigation pivot may be problematic for the mobile VOR test, but should be negated by the Doppler conversion and elevated counterpoise in the end-state VOR configuration. We recommend the irrigation pivot be oriented perpendicularly for the mobile VOR test in order to capture the worst case scenario impacts on VOR performance and potential restrictions.

4. **Environmental concerns**
   - A sheen was noted on the water on the west portion of the property. This property will likely require discussion with USACE due to proximity to waterway; USFWS for potential impact to wildlife as a result of tree trimming and/or removal; USDA as this property is currently farmland; SHPO for potential historical impacts due to proximity to Civil War Historical Sites; THPO for tribal historical impacts due to proximity to burial mounds.
   - This property is recommended for Math Modeling and Mobile VOR Testing. If testing is to move forward on this property, it is requested that a preliminary Phase 1 ESA/EDDA and an archeological survey be performed.

5. **Power availability**
   - Single phase power is located within a few hundred feet of the proposed site and 3 phase power is available within a mile per email from Entergy.

6. **Electronics evaluation**
   - There are aerial power lines along the entrance to the property that penetrate the restriction of 1200 feet and will have to be relocated underground. There is an irrigation pivot approximately 1600 feet from the proposed VORTAC plot that may restrict portions of the VOR signal, this is anticipated to mostly impact the mobile VOR test trailer. Math modeling should be performed at this location to include the irrigation system. This is the best candidate site of all properties we evaluated from an operational perspective.

Ginhouse Lake Site

Fulkerson Site – Colonel Maynard Road

Issues:

1. **Site access:**
   - Did not have Right of Entry to access to the site, this site viewed from the road.

2. **High voltage transmission lines and towers**
   - Transmission towers and high tension power lines span the entire western boundary of this property. Overhead power and possible telephone lines span the entire eastern boundary of this property. Both sets of overhead lines likely conflict with items E, F, J, M and N of the CVSC.

3. **Tree line**
   - Trees appear to pose an issue to this site. The tree line extends above the western high voltage transmission lines, likely in conflict with items H and I of the CVSC.

4. **Environmental concerns**
   - The site could not be evaluated for environmental impacts because Right of Entry was not established.

5. **Power availability**
   - Information was not provided on this site from Entergy.

6. **Electronics evaluation**
   - There are tall large metal towers with high tension power lines that disqualify this site. No math modeling should be performed on this site.

Fulkerson Site

Salmon Property – Stonelinks Golf Course

Issues:

1. **High voltage transmission lines & overhead power lines**
   - Overhead power lines and poles adjacent to the proposed VOR Antenna location penetrate the 1.5° angle specified in item F of the CVSC. The proximity of the lines conflict with items D, E, J, L, M and N of the CVSC. These lines would need to be removed or buried prior to mobile VOR testing.
   - There are high voltage transmission lines to the South of the proposed VOR Plot, across Faulkner Lake Road. Due to the terrain surrounding the VOR Antenna location, these lines could not be surveyed at the 0.5° angle specified in item J of the CVSC, however they are anticipated to significantly impact the operation of the VOR.

2. **Tree line**
   - A 360° obstruction survey was performed at 2.5° per item N and I of the CVSC. Individual tree penetrations were observed at approximate bearings of 261°45', 271°50', 285°51', 293°20', 301°20', 307°23'. Groups of trees penetrated the 2.5° vertical angle at approximate bearings of 311°18', 321°35', 325°30' and 328°28'.
   - There is a group of trees at approximate bearing of 57°20' from the proposed VOR Antenna location that is within the 1000 foot requirement specified in item H of the CVSC. These trees would need to be removed prior to mobile VOR testing.
   - There is a large group of trees surrounding the pond adjacent to the South side of the proposed VOR Plot. These trees would need to be removed prior to mobile VOR testing.
   - There are additional trees within the 1000 foot radius of the VOR Antenna location that will most likely need to be removed, mostly to the South of the proposed location. Many of these are obscured by the terrain and tree line surrounding the pond to the South.

3. **Terrain**
   - Significant portion of the Northeastern quadrant of the property is inside Zone A of the floodplain, very close in proximity to the proposed VOR Plot. Significant fill work may need to take place to ensure the site cannot be flooded and all-weather access guaranteed to maintenance personnel.
   - Large pond adjacent to South side of proposed VOR Plot would need to be filled in and terrain smoothed out prior to mobile VOR testing. The slope of this pond would likely block southward RF signal from the mobile VOR.
   - Second large pond further to the south of the proposed VOR Plot would need to be filled in and terrain smoothed out prior to mobile VOR testing. This pond holds significant water, which will have negative impacts on VOR performance and reliability. Terrain slopes down to the North of the proposed VOR Plot. This is not a disqualifier, however this will have a negative impact on VOR performance.
   - Multiple elevated moguls or tee boxes from the golf course are located within the critical area of the proposed VOR Plot. All of these features would need to be removed prior to mobile VOR testing.

4. **Environmental concerns**
   - Removal of ponds will most likely require coordination with UCACE and USFWS for impacts to runoff and wildlife.
   - Demolition of the maintenance building but may require an archaeological study, but this is unlikely.
   - There is a flowing creek is on the west and north sides of the property. Construction of access road to proposed VOR Plot may require coordination with USACE.

5. **Power availability**
   - Single phase power is located along the west and south sides of the property and 3 phase across the street at the corner of State Dairy and Faulkner Lake Roads per email from Entergy.

6. **Electronics evaluation**
   - The area has a gentle slope overall but has moguls left over from the golf course which will need to be leveled. The dried up water hazards will need to be filled in. There is a concern for vandalism due to the proximity to the housing editions. We do not recommend that math modeling be performed at this site. If the modeling is performed, all obstructions should be included in the model, including the irrigation system and nearby transmission lines. There are high voltage transmission lines to the South of the property which will likely have a significant impact to the operation of the VOR.

Salmon Property - Stonelinks Site

Theo Road Site

Issues:

1. **High voltage transmission lines**
   - High voltage transmission lines observed to the West of the proposed VOR Plot. These transmission lines extend above approximately 1° above horizontal to the Southwest of the property, are approximately 1°10' above horizontal to the West of the property, and are approximately 49' above horizontal to the Northwest of the property. The transmission lines are visible from an approximate bearing of 217°34' through 290°29'**.** These transmission lines penetrate the angle specified in item J of the CVSC.

2. **Tree line**
   - Tree line observed to the North of the proposed VOR Plot, ranging from approximate vertical angle of 4°24' above horizontal to 4°33' above horizontal when panning from Northwest to Northeast. These trees penetrate the angle specified in item I of the CVSC. Distance to tree line when measured was 949.5 feet, conflicting with item H of the CVSC.
   - A second group of trees is located a distance of 733 feet from the proposed VOR Antenna Location. The trees surround an intermittent stream that feeds into a creek on the north side of the property. This group of trees also conflicts with Item H of the CVSC.

3. **Terrain**
   - Storage silos observed to the Northwest of the proposed VOR Site. These silos would likely result in radial restrictions to the VOR, penetrating the angle specified in items J and M of the CVSC.
   - Fill dirt mounds observed along the gravel access road to the site. These mounds would need to be removed prior to mobile VOR testing.
   - Signs of potential flood issues observed for road into and out of the facility when entering from Theo Road. Exit to Faulkner Lake Road is through an active construction site, which may complicate access and egress.
   - Quarry located to the Northwest of the proposed VOR Plot holds water. This may have significant impact to operation and reliability of the VOR.
   - Proximity to and visibility from nearby residential neighborhood raises concerns of vandalism. This is an unmanned facility with potential to broadcast Hazardous Misleading Information in the event of vandalism.

4. **Environmental concerns**
   - Large groups of trees will be required to be cut down, this will require coordination with USACE for area surrounding intermittent stream and USFWS for wildlife/fauna.
   - If the gravel pit areas holding water need to be filled in, this may not be feasible due to Canadian geese observed in one of the pits.

5. **Electronics evaluation**
   - Due to the tall power lines to the West of the VOR Plot and proximity to the houses this site should not be considered. No math modeling should be performed for this site.

Theo Road Site

Existing VORTAC site

Issues:

- Existing Propane tank for the engine generator is required to be removed and disposed of properly.
- The existing building is from the 40's/50's and will require coordination with the SHPO before any type of demolition can occur.
- Building has asbestos and lead-based paint (LBP). FAA will review the records of the existing HAZMAT analysis and will suggest a thorough hazmat survey be completed at this site including any TCLP testing for the LBP.
- A field visit may be required from personnel from the SHPO office. A submittal will need to be completed outlining the following:
    a. Why this project is occurring.
    b. The history and purpose of the building.
    c. Photographs of the building.
    d. The location of the new VORTAC facility.

EXISTING VORTAC

EXISTING VORTAC

Recommendations

- The only site that was found to meet the requirements defined in the Condensed VOR Siting Criteria without the need for substantial site work in advance of the Mobile VOR Test is the Ginhouse Lake site. We recommend that math modeling be performed for this location.

- Should additional sites become available for review, we will make a return site evaluation trip on short notice.

References

1. **VOR/Vortac Siting Criteria - Handbook 6700.11**
2. **UFC 4-141-10N, 16 January 2004**
   UNIFIED FACILITIES CRITERIA (UFC)
   DESIGN: AVIATION OPERATION AND SUPPORT FACILITIES
3. **FAA Order 6820.10, VOR, VOR/DME, and VORTAC Siting Criteria.**

CENTRAL SERVICE AREA (CSA)

LIT VOR SITING REPORT # 2

LITTLE ROCK, ARKANSAS

PREPARED BY: SHELBY BOHMFALK
(NAVAIDS LEAD ENGINEER)

FAA TECH OPS – NAVAIDS ENGINEERING GROUP
(12/13/2018)

INTRODUCTION

On November 28, 2018, FAA Engineering Services out of Fort Worth, Texas and Garver Engineering out of Little Rock, Arkansas performed additional site surveys to evaluate two potential locations for the relocation of the existing Little Rock, Arkansas VOR facility. A condensed VOR siting criteria listed in Section 1 of this report was used to evaluate each of the sites. The results of these surveys and photographs of these locations are detailed in Section 2 of this report.

Attendees:

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Section 1. CONDENSED VOR SITING CRITERIA

A. Within 200 feet, no farm-type wire fences 4 feet or more in height.

B. Within 500 feet, no chain type fence 6 feet or more in height.

C. “A” and “B” restrictions may be relaxed for fences essentially radial to the antenna.

D. Power and control lines should be installed underground for a minimum of 600 feet from the antenna.

E. Overhead power and control lines should be essentially radial to the antenna for a minimum distance of 1200 feet.

F. No other lines or supporting structures should subtend a vertical angle of more than 1.5 degrees above the site.

G. Single trees of moderate height (up to 30 feet) may be tolerated beyond 500 feet. No trees should be closer than 500 feet.

H. No group of trees within 1000 feet of the site.

I. No trees should subtend a vertical angle of more than 2.0 degrees above the site.

J. No fence or lines should extend more than 0.5 degrees above the antenna.

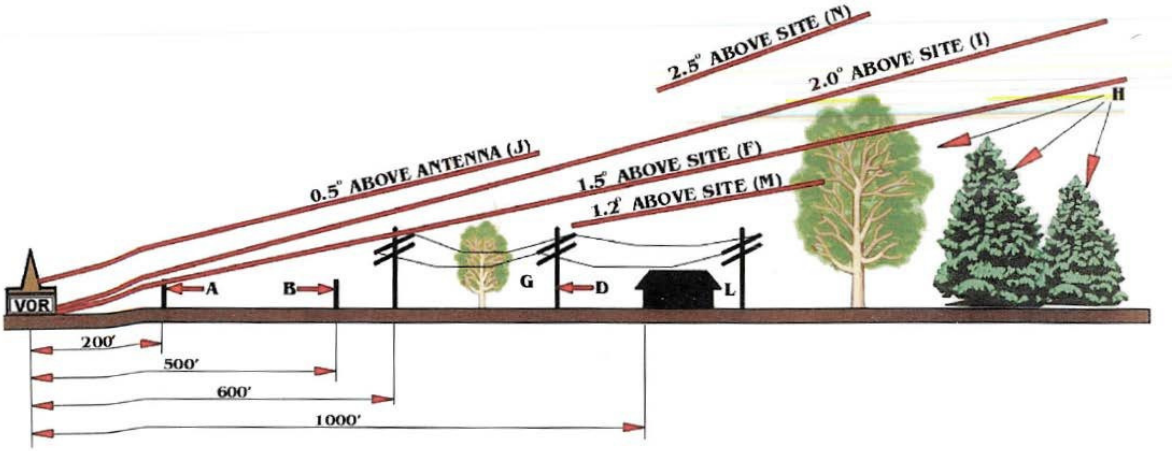
K. On airports, all buildings should be considered as if they were power and telephone lines.

L. There shall be no structures within 1000 feet of the antenna.

M. All structures that are partly or entirely metallic shall subtend vertical angles of less than 1.2 degrees.

N. Wooden structures with negligible metallic content may be tolerated below 2.5 degrees.

NOTE: Since there are many possible combinations of height and orientation of wire lines and fences with various terrain configurations, these matters will require special study by engineering personnel at each site in question to determine whether a particular situation can be expected to produce objectionable effects.



Section 2. SITE EVALUATIONS

Davidson Property – Adjacent Highway 440, North of I-40

Issues:

1. **Floodplain**
    - The proposed VOR site and 1000 foot radius around the site are all within the 500 year floodplain. Some parts of the adjacent property to the East of the proposed VOR site are within the 100 year floodplain. Coordination will be required with USACE and likely USFWS if this site is selected.
    - The site was muddy and required a four wheel drive vehicle to access the plot. Two areas within the 1000 foot radius held a few inches of water at the time of the site visit.
    - Exact flood elevations are not readily available at the site, further evaluation will be required if this property is selected to ensure the VOR facility plot and access road are elevated above the 500 year flood elevation. Review of aerial photography from 1994 to present showed that the two areas that held water during the site visit are the only areas of the property that seasonally hold water. In some years the entire property was dry.
    - The areas that hold water are close enough to the proposed VOR site that they should not impact the operation of the VOR as they will be blocked by the extended counterpoise around the VOR antenna. An elevated gravel facility plot and access road will alleviate floodplain concerns.

2. **Grain Silo**
    - To the Southeast of the proposed location there is a large metallic grain silo. The Silo is located at a bearing of 158° 15' from North as observed from the proposed VOR location. The silo is located approximately 4,450 feet from the proposed VOR location.
    - As observed from the proposed VOR location, the silo subtends a vertical angle of 0.5° above horizontal. This is well clear of the 1.2° limit defined in item M of the Condensed VOR Siting Criteria (referred to hereafter as CVSC.)

3. **Irrigation Pivot**
    - To the East of the proposed VOR location there is an irrigation pivot that is used to irrigate the grass used for cattle grazing. The irrigation pivot extends from a bearing of 129° 27' to 134° 29' from North as observed from the proposed VOR location. The pivot is 741 feet from the proposed VOR site, encroaching the 1000 foot structure clearance requirement specified in item L of the CVSC.
    - As observed from the proposed VOR location, the irrigation pivot subtends a vertical angle of 0° 33' above horizontal. This is well clear of the 1.2° limit defined in item M of the CVSC.

4. **Trees**
    - There are small groups of trees that penetrate the 2° angle specified in item I of the CVSC. These trees are located at bearings of 14° 36', 290° 28', 315° 42', and 321° 37' from North as observed from the proposed VOR location. These trees are approximately 1600 feet from the proposed VOR site.
    - A group of trees penetrate the 2° angle specified in item I of the CVSC from a bearing of 258° 27' to 282° 30' from North. The high point of this group of trees subtends a vertical angle of 2° 38' above horizontal. This group of trees is located off of the Davidson property, across highway 440.

5. **Highway 440**
    - Highway 440 is adjacent to the western boundary of the Davidson property. The highway is elevated above surrounding terrain, but not significantly. Highway 440 was measured to be 1051 feet from the proposed VOR location.

6. **Environmental Concerns**
    - There are some trees on the property which may need to be removed. Removal of these trees may require coordination with USFWS as waterfowl and raptors were observed on the property. A wildlife survey may also be necessary.
    - A diesel engine and above ground fuel storage tank (AST) are located adjacent to the irrigation pivot. Several fuel and oil filters were observed on the ground near the AST. No sheen was observed around the AST, indicating that the soil is not likely to be contaminated.
    - An underground liquid fuel pipeline is located to the South and East of the proposed VOR location. The pipeline appears to be just outside of the proposed boundaries of the VOR property. It is recommended that if this property is selected that it be platted such that the pipeline is clearly outside of the FAA property line.
    - Coordination with the State Historic Preservation Office (SHPO) and a historic study will be required due to the graveyard near the entrance to the property.

7. **Electronics Evaluation**
    - The Davidson property is a prime location for a VOR facility in comparison with most of the other properties we have evaluated.
    - The irrigation pivot may have an effect on the performance of the Mobile VOR Test Trailer. We would recommend that the pivot be oriented broadside to the VOR trailer during testing to identify the worst case impact to VOR performance. The irrigation pivot is not anticipated to impact the performance of the end-state Doppler VOR system.
    - The slight ponding on the site should not impact the VOR performance.
    - An elevated landfill is visible to the North of the Davidson property. The results of Mobile VOR Test will determine if this landfill will impact the operation of the facility or cause excessive radial restrictions. Initial impression is that the landfill will not be of significant impact.
    - Muddy conditions and rough rutted terrain in route to the proposed VOR location may be problematic for the Mobile VOR Test Trailer as bouncing the equipment around may cause parts to fail. It is recommended that some sort of gravel access road be built to the proposed VOR site to minimize potential bouncing and damage of equipment. The recommended road will need to support a light duty truck and an approximately 10,000 lb trailer.

8. **Power Availability**
    - 3-Phase power is not immediately available at this site. Per Garver coordination with the utility provider, it can be brought to the site at a reasonable cost.

Davidson Property

Tulip Property – Adjacent Highway 70, 1 Mile East of Galloway, AR

Issues:

1. **Water Tower**
   - There is a large water tower approximately 8,500 feet to the West of the proposed VOR location. The water tower is located at a bearing 292° 27' from the proposed VOR site. The water tower subtends a vertical angle of 1° 14' from horizontal as observed from the VOR site, slightly penetrating the 1.2° angle specified in item M of the CVSC. The height and width of the water tower may impact the performance of the VOR. If this site is selected for Mobile VOR testing, the results will determine if this water tower will significantly impact the operation of the facility and identify the extent of potential radial restrictions. It is recommended that this water tower be included in any math-modeling performed for this site.

2. **Concrete Silos**
   - Two concrete silos are visible from the proposed VOR location. The first concrete silo is located at a bearing of 245° 30' from North as observed from the proposed VOR site, subtending a vertical angle of 1° 10' above horizontal. This silo is just under the 1° angle specified in item M of the CVSC.
   - The second concrete silo is located at a bearing of 287° 04' from North as observed from the VOR site, subtending an angle of 0° 36' above horizontal. This silo is located approximately 1700 feet from the proposed VOR site and does not violate any criteria of the CVSC.

3. **Billboards and Cell Towers**
   - Billboards and Cell towers were observed at approximate bearings of 288° 15', 296° 03' and 108° 26' from North as measured from the proposed VOR site. The tallest of these structures subtended a vertical angle of 1° 0' above horizontal. None of these structures violate any criteria of the CVSC, however they have potential to slightly impact the evaluation of the site during the Mobile VOR Test due to their orientation relative to the VOR site.

4. **Trees**
   - A significant treeline penetrates the 2° angle specified in item I of the CVSC from a bearing of 348° 48' through 61° 43' from North as observed from the proposed VOR location. The largest vertical penetration was 3° 12' above horizontal, and was located approximately 1278 feet from the VOR location.
   - A second treeline penetrates the 2° angle specified in item I of the CVSC from a bearing of 198° 34' through 236° 11' from North as observed from the proposed VOR location. The largest vertical penetration was 2° 23' above horizontal.

5. **Environmental Concerns**
   - Highway 70 separates this property from Hills Lake. In the event that the lake floods, the VOR site may be inaccessible as the site can only be accessed via Highway 70. If tree trimming or removal is necessary for VOR operation, coordination with USACE and USFWS may be required.

6. Electronics Evaluation

- The Tulip site is relatively flat. There was no irrigation pivot on the property at the time of the site visit, however the property is set up for one. 3-Phase power and Telco are available near the site. There is a water tower that slightly penetrates the obstruction angle and may block the signal when evaluated for radial coverage. This may impose restrictions on the new facility but the Mobile VOR Test will identify if any of the coverage orbit will be restricted. Initial impression is that only missed approach procedures to small airports in the area may be affected.

Tulip Property

Recommendations:

Both the Davidson and Tulip properties are considered prime potential VOR locations. Operationally, the Davidson property appears to have less obstructions which could potentially impact the performance of the VOR. The Tulip property is outside of any known floodplain and will require less site work to ensure the site is safe from flood damage and accessible in any weather conditions. Both of these properties are recommended to proceed with Math-Modeling and will be submitted to FAA Flight Procedures for initial feasibility studies.

References

1. **VOR/Vortac Siting Criteria - Handbook 6700.11**
2. **UFC 4-141-10N, 16 January 2004**
   UNIFIED FACILITIES CRITERIA (UFC)
   DESIGN: AVIATION OPERATION AND SUPPORT FACILITIES
3. **FAA Order 6820.10, VOR, VOR/DME, and VORTAC Siting Criteria.**