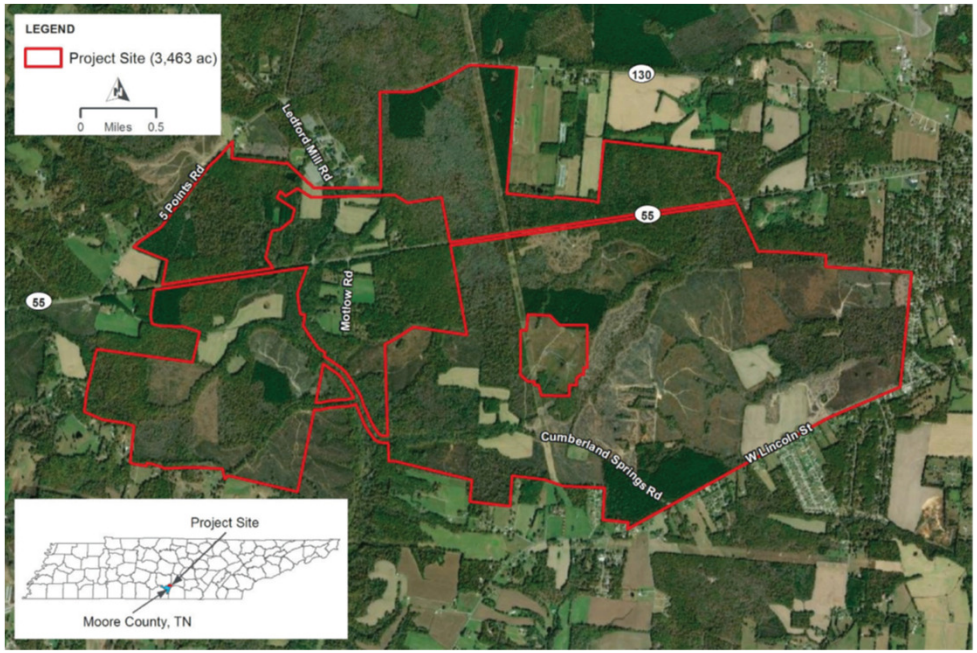
Moore County TN

Solar Farm RF Noise Study

(baseline)

Surprise Moore County Getting a Solar Farm!

- 200 Megwatt Capacity
- 1300 acres (panels)
- 4,300 acres site
- Spans Eastern Portion of Moore County
- Boundary with Tullahoma
- Impact Studiy - Concerns for water, minorities Environmental
- Not Mentioned radio interference
- Planned over ~3 years with incremental approval
- Plans out in the open … IF you know where to look.
- County Government and News all for it!
- Biggest thing to hit Moore County since J.D.



- Colo-located with sheep farm (Solar Ranch)

https://www.siliconranch.com/

https://www.govinfo.gov/content/pkg/FR-2021-05-03/pdf/2021-09223.pdf

Community Concerns:

- Construction Impacts
- Property Values
- Water Quality Impacts (local wells in use)
- Location in Proximity to Neighborhoods
- Operational Audio Noise
- Site to be bordered by “tree boundary”
- Construction Phase impacts
- Panels secured by steel piles (noise during construction)
- 1 Axis tracking (Maintenance)
- 100 year old Oak forest cut down to prepare site. (Green?)
- My Concern .. Radio Noise reducing sensitivity of radio equipment 200 megawatt AM radio station being installed across the street from neighborhood

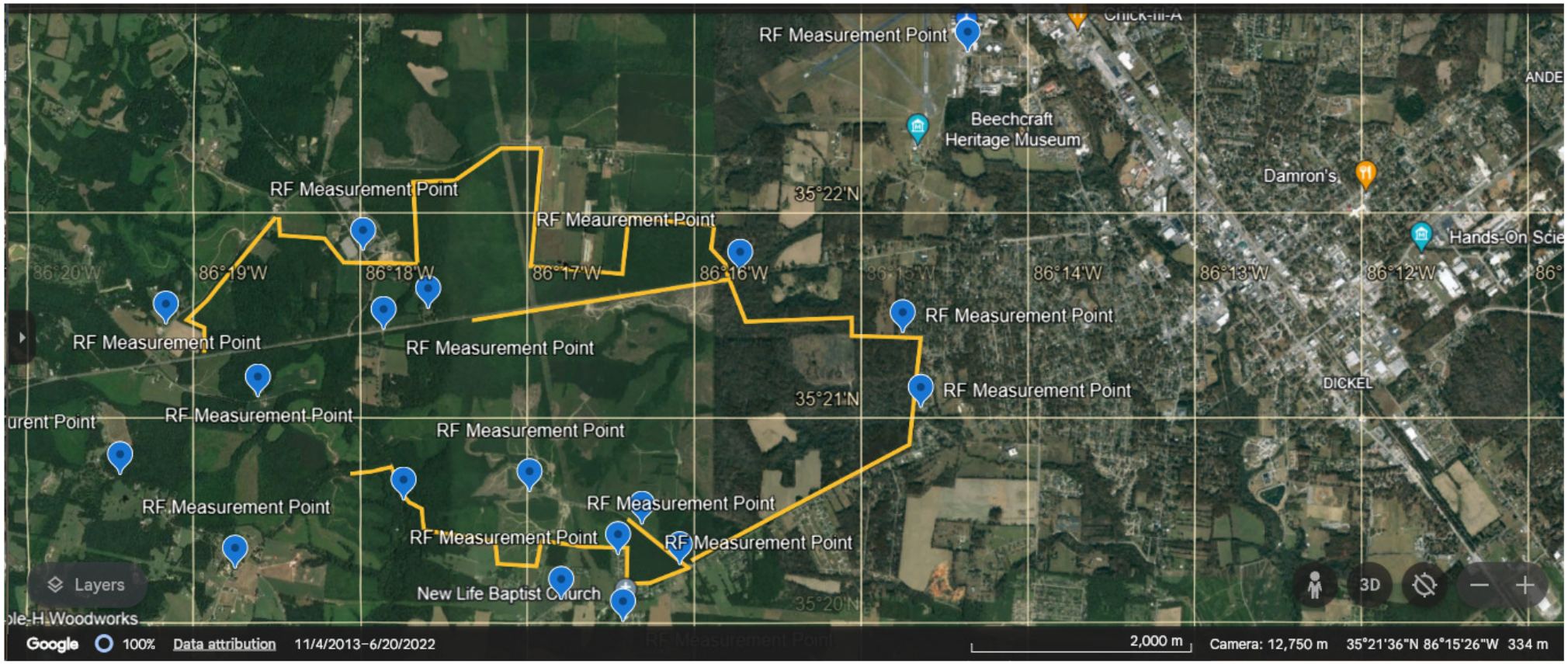
General Concerns:

- No apparent Radio Emissions Standards for Solar Plants
  - Main concern in the study: minimize impact to Marginalized Communities
- Vague instructions to correct radio interference issues on installation (FCC)
- Project Manager claims most electrical noise is below 1 Mhz
- FCC/ Federal/State and TVA are advocates – install first remedy later.
- Installation cost being reported as $100 Million (Believe it is closer to ~$250 Million) (ROM estimate)
- Site life 20 years – then panels to be recycled

Plan:

- Setup SUV to perform an RF survey (Before and After Solar Farm activation) (Laptop, second screen , battery, receiver, antennas)
- Sample Sites over multiple signals and record
- Report results to :
  - Moore County EMA
  - ARES (TN)
  - ARRL
  - Solar Ranch
  - Local News Agencies

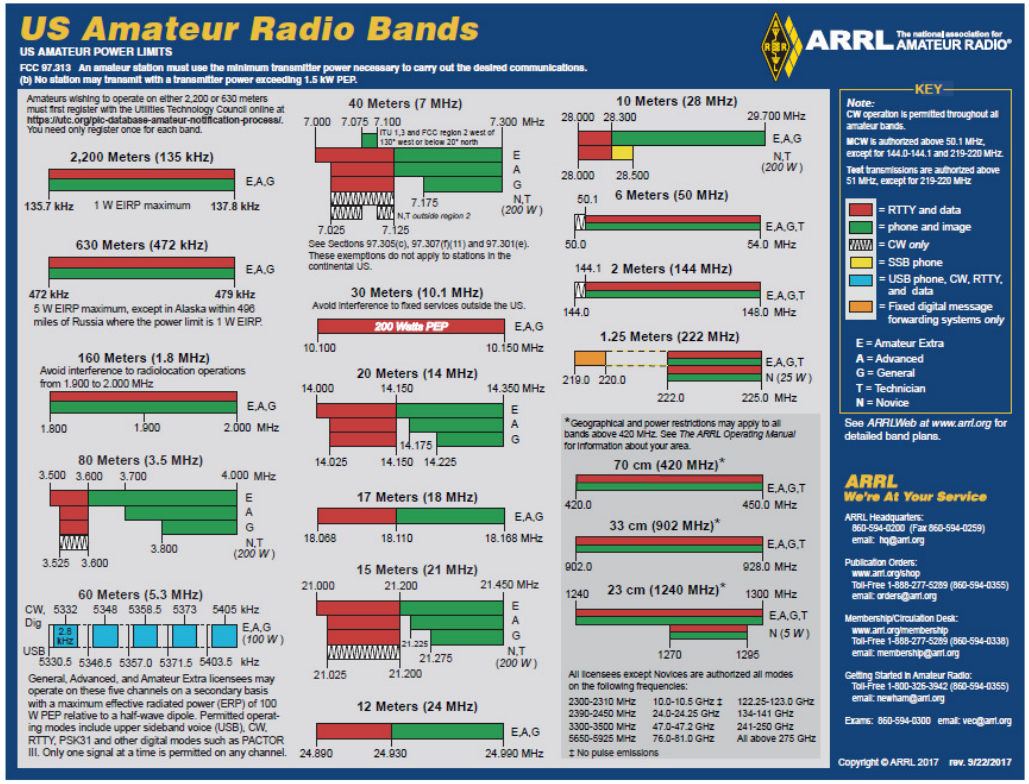
RF Measurement Plan – Google Earth



RF Frequency – suitable tuned antennas will be used.

- Scanned Frequencies: (Proposed)
  - SSB - ~3.98 MHz TN Emergency Frequency (no stations)
  - SSB - ~ 7 to 7.3 MHz Amateur radio (no stations)
  - SSB - ~14 MHz
  - SSB - ~28 MHz
  - AM/SSB ~ 26.9 - 27.5 Mhz CB
  - SSB - ~50 MHz
  - AM Radio Band
  - FM – VHF ~broadcast FM band (no station)
  - FM - VHF ~140 MHz Amateur Radio Band
  - FM – VHF ~162.524 WNG554 MHz National Weather Service Winchester (AL)
  - FM – VHF ~440 MHz Amateur Radio Band
  - FM – VHF ~460 MHz Public Service Band
  - Cell Phone App LTE – Discovery cell phone band signal strength
  - Audible sound level – Spectroid app on phone – DB level no cars no construction

Amateur Radio Bands



Measurement Issues

- Perfect Antenna match not available on all frequencies
- Measurements over time – will record weather/time of day etc.
- Sites will be prioritized areas closes to Inverter and Power equipment will be checked first.
- Will use same equipment both baseline and final and check signal levels against known sources (broadcast radio, NWS etc)

Hardware

- Software Defined Radio Receiver – SDRPlay RSP1B
- SDRuno Software
- Antenna’s
- Roof mounted antenna on SUV
- Safety Vest – warning lights, cones
- Public Roads (roadside stops) Motlow parking lot, Neighborhood Cul-de-sacs)

SDRPlay RSP1B KEY BENEFITS & FEATURES

•New, enhanced version of the RSP1A in a rugged black painted steel case

•Improved noise performance below 1MHz and in the 3.5-5.5MHz, 50-60 MHz and 250-320MHz ranges

•Improved signal handling at HF frequencies.

•Covers all frequencies from 1kHz through VLF, LF, MW, HF, VHF, UHF and L-band to 2GHz, with

•Receive, monitor and record up to 10MHz of spectrum at a time

•14-bit ADC silicon technology for excellent dynamic range

•Multiple high-performance preselect filters minimize phantom signal problems

•Software selectable AM/FM & DAB broadcast band notch filters minimise intermodulation pro

•Multiple individual receivers in any 10MHz slice of spectrum

•Free use of Windows-based SDRuno software (check website for versions supported)

•Free use of SDRconnect SDR and server software for Windows, MacOS and Linux (Check websi

•Multiplatform driver and API support including Windows, Linux, Mac, Android and Raspberry F

•Powers over the USB cable with a simple, robust type B socket

•Software selectable 4.7V Bias-T for powering an external remote antenna amplifier

•Calibrated S meter/ RF power and SNR measurement

•Compatible with many 3rd Party software digital decoders

•Documented API provided to allow demodulator or application development on multiple platforms

•Strong and growing software support network

Comments/ Questions