

EVOLUTION OF CONCEPTUAL SITE MODEL (CSM) FOR BOSTWICK BOMB TARGET

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ACKNOWLEDGEMENT



The figures and content of this presentation are sourced from the Draft Final RI/FS Bostwick Bomb Target report. This report is still in the process of being finalized.



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ACRONYM LIST



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Advanced Geophysical Classification (AGC)	Munitions and Explosives of Concern (MEC)
Anomaly Per Acre (APA)	Munitions Constituents (MC)
Archive Search Report (ASR)	Munitions Debris (MD)
Conceptual Site Model (CSM)	Munitions Response Site (MRS)
Data Quality Objective (DQO)	US Army Corps Engineers St. Louis District (MVS)
Digital Geophysical Mapping (DGM)	No Evidence of Use (NEU)
Florida Department of Environmental Protection (FDEP)	Project Delivery Team (PDT)
Formerly Used Defense Site (FUDS)	Remedial Investigation (RI)
High Density (HD)	Target of Interest (TOI)
High Use Area (HUA)	Virtual Sample Plan (VSP)
Inventory Project Report (INPR)	
Low Density (LD)	
Low Use Area (LUA)	

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STAKEHOLDERS



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Project stakeholders, included:

- USACE, Jacksonville District;
- U.S. Army Engineering and Support Center, Huntsville;
- Florida Department of Environmental Protection (FDEP); and
- Private property owners,

All participated in the development of the project approach.



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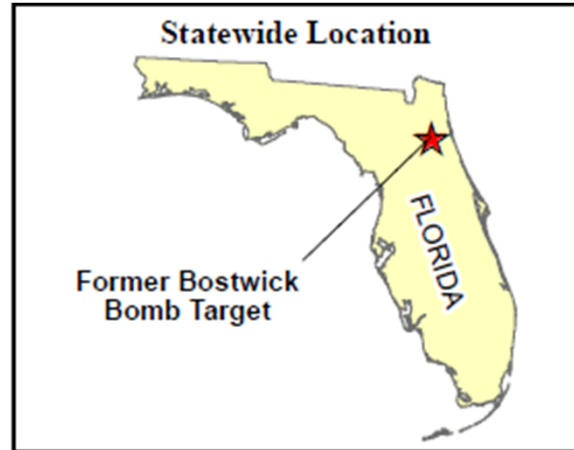
SITE HISTORY



In 1940, the Navy acquired 640 acres approximately three miles northwest of Bostwick in Putnam County, Florida.

The target became known as both the

- Bostwick Bomb Target, and/or
- Putnam Bombing Range.



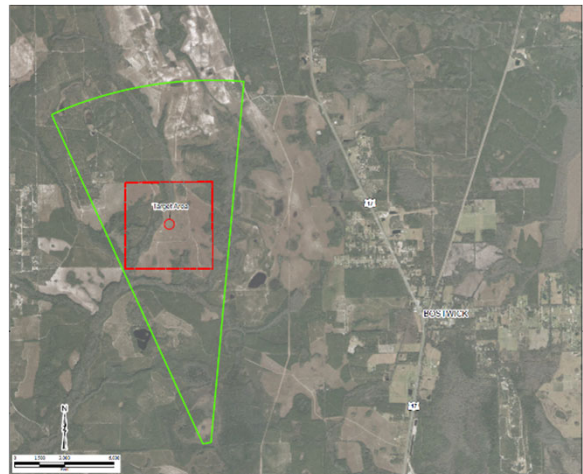
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SITE HISTORY CONTINUED



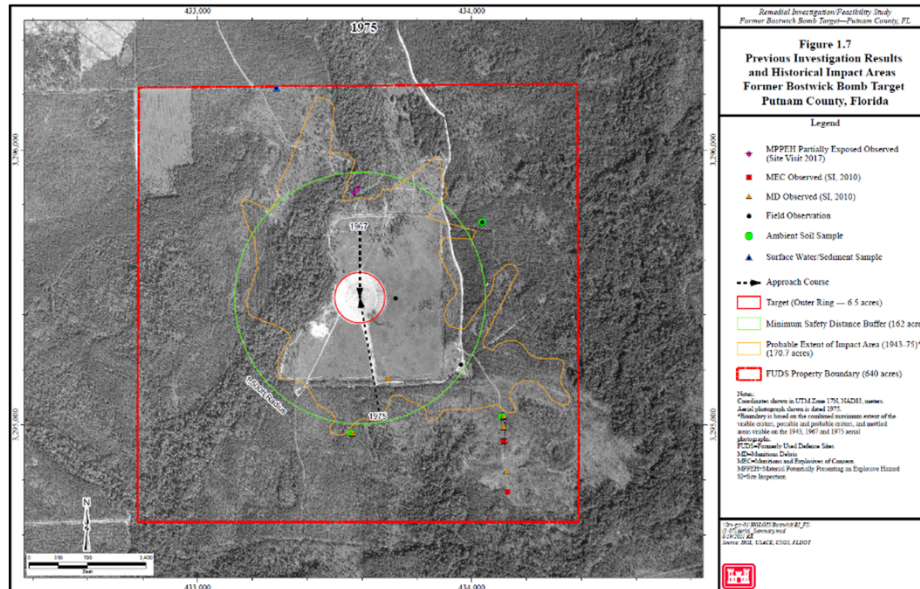
- The Inventory Project Report (INPR) confirmed the location and historical use of the site. For the INPR, the bomb target area was calculated to extend beyond the target center by 3,000 feet for a total of 649 acres (originally 640 acres) (red box) including safety buffers for uncertainties in altitude and flight speed of training aircraft.
- There is no historical evidence of bombing activities outside the 640 acre FUDS property.
- The 2004 ASR established a 3,111 acre range fan (yellow fan) based on how far an aircraft rocket could travel after it was fired.



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SITE HISTORY CONTINUED



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CURRENT USE AND RECEPTORS



The MRS is currently primarily used for pine tree harvesting.

The preliminary CSM for the MRS indicates potentially complete MEC and MC exposure pathways are present for human receptors at the MRS, including, but not limited to, on-site workers (i.e., timber harvester and wetland surveyor) and recreational users.



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DATA QUALITY OBJECTIVES



The project DQOs were to obtain data to characterize the nature and extent of any MEC or MC contamination present at the MRS.



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RI FIELDWORK 2019/2020



- The initial RI characterization effort centered around the 640-acre bomb target area.
- Dynamic DGM using the EM61 was collected along transects in 2019/2020.
- 2019 transects were 547 feet apart (purple transects) and based on detecting a 2.75 inch rocket target area.
- In 2019, 20mm projectile MD were found that **were not** in the initial conceptual site model.
- This led to a data gap that warranted additional RI investigations during the 2020 field season.
- The 2020 transects were 275 feet apart (orange transects).
- For the 2020 survey, the EM61 was lowered to 20 cm to aid in the detection of 20mm projectiles.



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ANOMALY DENSITY

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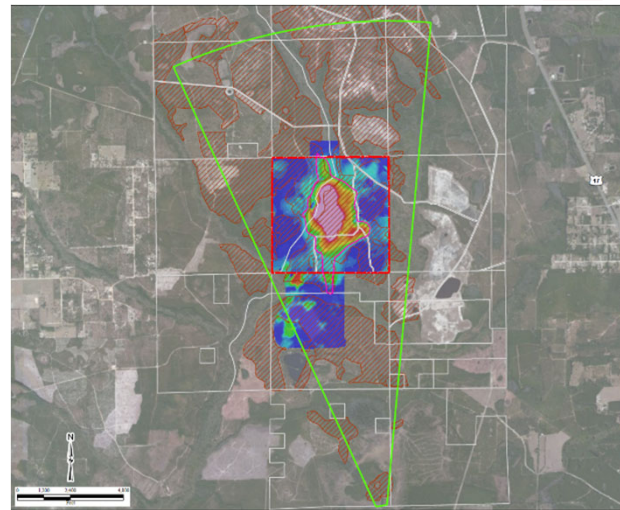


Following the Dynamic DGM transects survey, an anomaly density map was produced in VSP.

Due to different coil heights used in the 2019 vs the 2020 survey, data from the two field seasons was analyzed independently.

A critical density of 350 anomalies per acre (APA) was used to define the HD boundary for the 2019 field season for the 640 acre target area.

The 2020 field season collected additional data beyond the 640 acre target area. A critical density of 80 APA was used.



VSP Density Based on DGM Transects (APA):
548 120 222 323 424 525 626 728 829 930 1031 1156
Anomaly Density (APA)

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AGC CUED SURVEY

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Following the PDT approval of the proposed grid locations, DGM was collected in twenty seven grids of varying sizes (50' x 50' up to 33' x 1,080').

Grids collected during the 2019 field season were collected at the standard coil height of 42cm using a threshold of 5mV on Channel 2 to select TOI.

Grids collected during the 2020 field season used a lower coil height of 20cm and a threshold of 9.6mV on Channel 2 to select TOI.

Following the dynamic survey, in the HD grids, a cued survey of the TOI was conducted using a TEMTADS 2x2 (TT 2x2) or the MetalMapper 2x2 (MM2x2).



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INTRUSIVE INVESTIGATION

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There were a total of 1,713 intrusive investigations conducted along transects and in grids.

There were:

- 1,338 lbs of MD and small arms ammunitions, and
- 184.7 lbs of non-munitions related debris



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INTRUSIVE RESULTS

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Intrusive Results in the High Use Areas

MD Type	Number Recovered	Depth Range (inches)	Modeled Depth of Detection*
2.25-inch Practice Rocket SCAR	5	1-16	28.3
2.75-inch Practice Rocket	55	1-38	24.8
20mm TP Projectile	12	0-5	7.1
25-lb Practice Bomb	128	0-40	Not Applicable
3-lb Practice Bomb	98	1-40	21.7
50-caliber Casing	1	4	Not Applicable
56-lb Practice Bomb	1	1	Not Applicable
5-inch HVAR Practice Rocket	1	4	44.1
BDU 33	33	1-30	32.3
Bomb Rack	2	20-30	Not Applicable
MD-undifferentiated	204	0-32	Not Applicable
MK 81 250-lb Practice Bomb	2	0	46.1
MK 89 56-lb Practice Bomb	1	8	Not Applicable
Practice Bomb-undifferentiated	6	20-32	Not Applicable
Total	549	--	--

Bold = Does not meet the RAO. The 20mm TP projectiles and debris recovered were related to models that are non-energetic and, therefore, not considered in the RAO, as they do not present an explosive hazard.

-- = not in DoD Library

*MM2X2

BDU = bomb dummy unit

SCAR = sub-caliber aircraft rocket

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Slide 14

SAJCUC(5 There was a background box in this slide showing. I just deleted it.

Sticker, Amanda J CIV USARMY CEHNC (USA), 5/11/2022



INTRUSIVE RESULTS CONTINUED

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Intrusive Results in the Low Use Areas

MD Type	Number Recovered	Depth Range (inches)	Modeled Depth of Detection*
2.25-inch Practice Rocket SCAR	1	10	28.3
2.75-inch Practice Rocket	26	0-12	24.8
20mm TP Projectile	2	2-6	7.1
3-lb Practice Bomb	7	4-18	21.7
5-inch HVAR Practice Rocket	1	10	44.1
BDU 33	14	2-33	32.3
MD-undifferentiated	14	2-6	Not Applicable
MK 89 56-lb Practice Bomb	1	3	Not Applicable
Total	66	--	--

Bold = Does not meet RAO. The 20mm TP projectiles and debris recovered were related to models that are non-energetic and, therefore, not considered in the RAO, as they do not present an explosive hazard.

-- = not in DoD Library

*MCMX2

BDU = bomb dummy unit

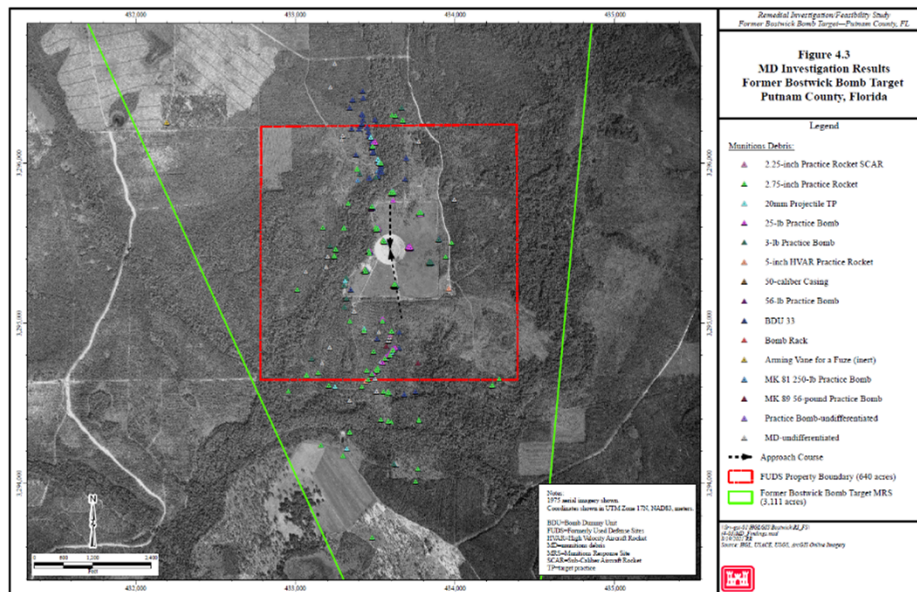
SCAR = sub-caliber aircraft rocket

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INTRUSIVE RESULTS CONTINUED

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UPDATED ROCKET RANGE FAN AND MODIFIED CSM

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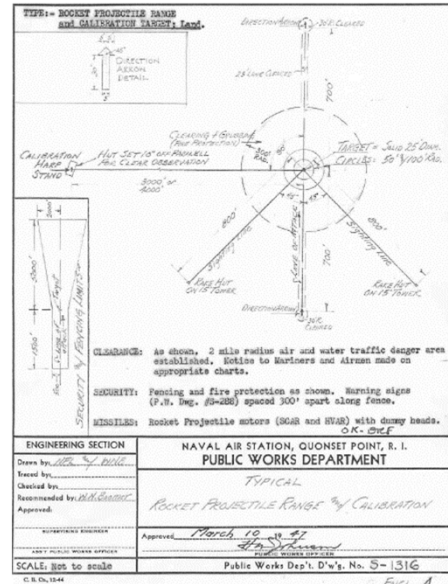


During the RI, the PDT and USACE-St. Louis District (MVS) went back to reassess the 3,111 acre range fan that was generated from the 2004 ASR. This range fan was a standard air to ground rocket range that was developed by MVS in the early 2000s based on historical range regulations.

But the findings from the RI did not match up to the 3,111 acre range fan and was not reflective of the training that had been conducted at the site.

Based on these findings and follow up PDT meetings with MVS, MVS noted that additional historical range regulations had been used since the earlier 2000s.

From the additional regulations, the figure to the right is a rocket range fan drawing from 1947 that was incorporated into the CSM to revise the larger range fan of 3,111 acres derived from the 2004 ASR to more accurately reflect the onsite training that was conducted and line up with the findings from the RI.

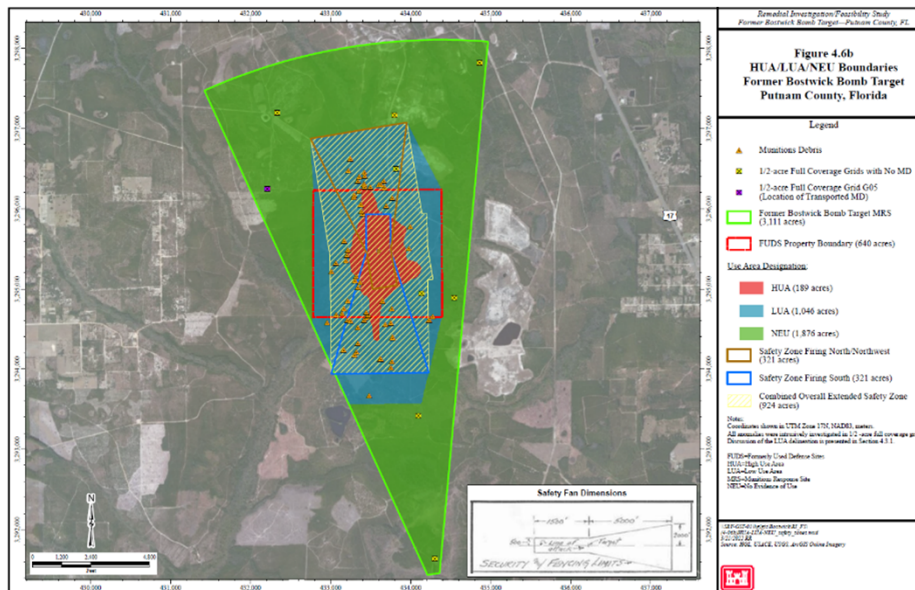


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REVISED HUA/LUA/NEU BOUNDARIES

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LESSONS LEARNED

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Throughout the RI phase, confirm the MRS boundary is in line with historical data (training records, historical photographs, etc.).

If the shape of the MRS boundary is not indicative of the historical training and RI results:

- The PDT should follow up with MVS to understand the origin of the MRS boundary and how it was applied.
- This point would be particularly important for older ASRs where more historic regulations are now available and used to ensure the MRS boundary is still applicable.

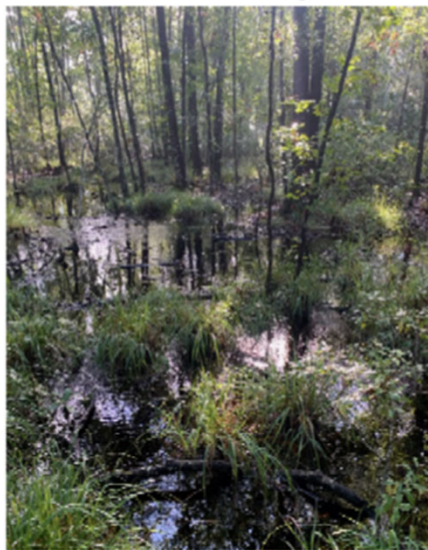
An important note is that the original FUDS acreage must still be accounted for if there is a MRS boundary reduction.

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QUESTIONS?

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