Frequently Asked Questions Public Safety Radio Project – Tower Placement
Updated February 19, 2026

What is the proposed tower for? Is it really necessary?

The County of Door is in the process of upgrading its aging VHF radio communications system to a modern digital UHF system. This system provides communications for all public safety agencies throughout the county, including Ephraim Fire and Rescue. The current system will reach its end-of-life in 2028, and the equipment is becoming increasingly difficult to support each year. This makes the upgrade and adherence to the project timeline critical.

The transition will improve communication quality and reliability throughout the county; however, UHF signals do not travel as far as VHF. As a result, additional tower sites are necessary to ensure adequate coverage – particularly in areas currently experiencing coverage issues, such as locations below the bluff in Ephraim *and especially downtown Ephraim*.

Tower placement is a key component of this upgrade, which impacts the effectiveness and reliability of the new system. The proposed location on German Road addresses issues with coverage in Ephraim found in earlier iterations and proposed locations.

Who is involved in the Public Safety Radio Project?

The project is being managed by the County of Door Technology Services Department along with their communications consultant Omnicom Consulting Group (OCG). The County is also planning to partner with Vertical Bridge for tower construction and Nsight for tower co-locations.

The Village's Community Protection Committee has been following the topic closely and will continue to do so. After a lot of back and forth, progress on how the project will be funded and the coverage in Ephraim has been improved since the initial conversations. County project representatives have presented to the Village Board with progress on the project on a few occasions: April 8, 2025, November 18, 2025, and February 10, 2026.

What is the timeline of the Public Safety Radio project?

The current system will reach its end of life in 2028. Tower locations throughout the County are being explored, along with that comes conversations about land agreements and acquisitions. While we do not have an exact go-live date at this time, once the agreements are in place, the County can move forward with all necessary site testing, and then construction. As the project progresses and a vendor is selected, the County will be able to firm up a go-live date.

Who is paying for the Public Safety Radio project?

The County will incur the costs of the initial purchase of the municipal public safety portables, mobiles, desktop control stations, and pagers (subscriber equipment). Along with the necessary subscriber equipment, the County is also incurring all of the infrastructure costs which includes, gear on the towers, within the shelters, at the dispatch center, and any software/licensing associated with the project. Vertical Bridge will build, own, and maintain the tower structure, with Door County and Nsight as proposed anchor tenants. There will be no cost to the Village to construct this proposed site or for the new equipment required on the site.

Going forward, municipalities will be responsible for a fee per device to cover biennial tuning of devices and for any replacement or upgraded devices.

When has this project been discussed by the Village?

The project was first presented to the Village Board on April 8, 2025. Initially, a sample costing model was presented that each municipality would be responsible for a portion of paying for the initial costs related to the project and new equipment (at the time, roughly $300,000 for Ephraim).

The County Radio Project was on the Community Protection Committee Meeting Agendas on: November 1, 2024, September 5, 2024 (as part of budget discussion), April 3, 2025, May 1, 2025, June 5, 2025, September 4, 2025, October 2, 2025, October 30, 2025, and January 28, 2026.

Why is the location on German Road being proposed for a tower?

With a UHF system/frequency, signals provide deeper penetration however, do not travel as far as VHF, requiring additional towers to provide the coverage that is needed around the County. The original system design included the use of an existing 400ft tower in Ellison Bay. Unfortunately, after structural assessments, it was determined that this tower cannot support the additional gear required for the upgrade. As a result, the County needed to adjust its system design. Working with their consultant, they were able to get an updated plan design, which includes the proposed German Road site, that meets the required coverage percentages while also taking into consideration the concerns voiced by the Village regarding coverage in key areas (e.g. below the bluff).

Have other tower locations in Ephraim been considered?

Yes. The Village Town Line Drive (Wastewater Treatment Plant and Maintenance Garage) property was also evaluated, but it does not provide sufficient coverage in key areas in Ephraim. The AT&T site in the Village was discussed, but it lacks the required height for microwave point-to-point communications.

The existing tower on German Road was reviewed, but is not viable due to the fact that it is already heavily loaded with equipment and lacks the space at the top to get the required height.

What are the parameters of the proposed tower and location?

The proposed tower is currently set for 180ft, keeping it below FAA lighting requirements. Height adjustments might be necessary once additional testing and studies have been completed. The proposed site would require an approximately 80 ft x 80 ft compound to accommodate the tower, generator, and shelter. The proposed location on the German Road property needs to comply with setbacks from the former landfill and also not interfere with the current and future Village operation of boat trailer parking and brush dump.

Are the environmental disruption (e.g. bird migration, NEPA, proximity to the former landfill, etc) and the proximity to the Ephraim-Gibraltar Airport being considered?

Yes. Once a location has been agreed to, engineers will come back to do additional testing to ensure that all of these important factors are incorporated into the design of the system. Testing will include all required archeological, geographical, and environmental studies to confirm the viability of the site. Along with all the necessary testing, FAA and FCC approval will be required. The engineers will report back to the County and to Ephraim once the testing is completed, which is expected by end of Summer 2026.

Have the implications to tourism been considered with the project?

Safety of our residents and visitors is the driving factor of the project. The proposed tower location on German Road provides the best coverage for Ephraim, more so than the other locations that have been explored.

Should we be concerned about emissions created from the proposed tower?

The FCC sets all the standards/requirements to regulate devices to ensure they do not exceed safe limits. All Public Safety Radio Vendors would be required to adhere to all of those standards. The more open space a radio wave has, the quicker the power and ultimately radiation dissipates. The antennas are also designed to project outward, where typical heavy exposure would come from standing directly in front of a device, like a Microwave Dish or antenna and not at ground level. Cellular and public safety radio frequencies emit non-ionizing radiation, which can't alter DNA, which is very much unlike gamma or x-rays so they in and of themselves are safer. Public Safety Radio Frequency (RF) gear typically produces less radiation than some home devices.

Can the Village control what other services are added to the proposed tower?

It depends on how the proposed tower is funded. The most fiscally and resource responsible for the County and its taxpayers, is to have Vertical Bridge own and manage the tower. If that is the case, then we have little control on what else can be added to the proposed tower should there be space for additional equipment. If the County owns the tower, the Village can have more control over what goes on it through an intergovernmental agreement.

Where can I find more information on this topic?

Village Board Minutes and Packets (linked in above Q & A sections)
Community Protection Committee Minutes and Packets (linked in above Q & A sections)
County Board
County of Door Communications Advisory Technical Subcommittee

Should you have any remaining questions or concerns, please send them to office@ephraim.wi.gov.

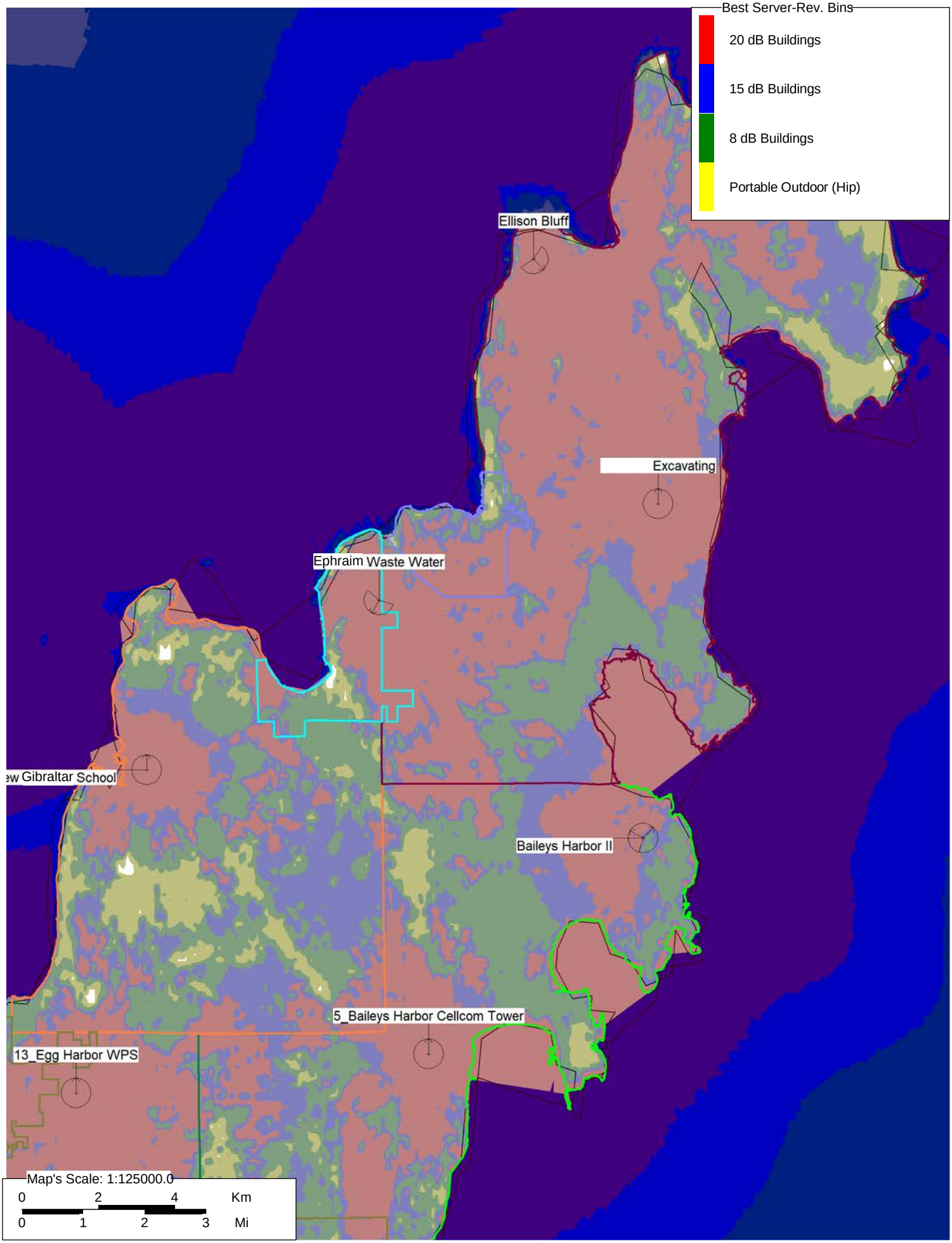
Additionally, Ashley DeGrave, Technology Services Project Manager can be reached at: adegrave@co.door.wi.gov, P: 920-746-2395, M: 920-495-2395

Comparison of the German Rd vs Waste Water parcels as well as sample tower/compound designs. The designs are subject to change, but that is what some of our others look like.

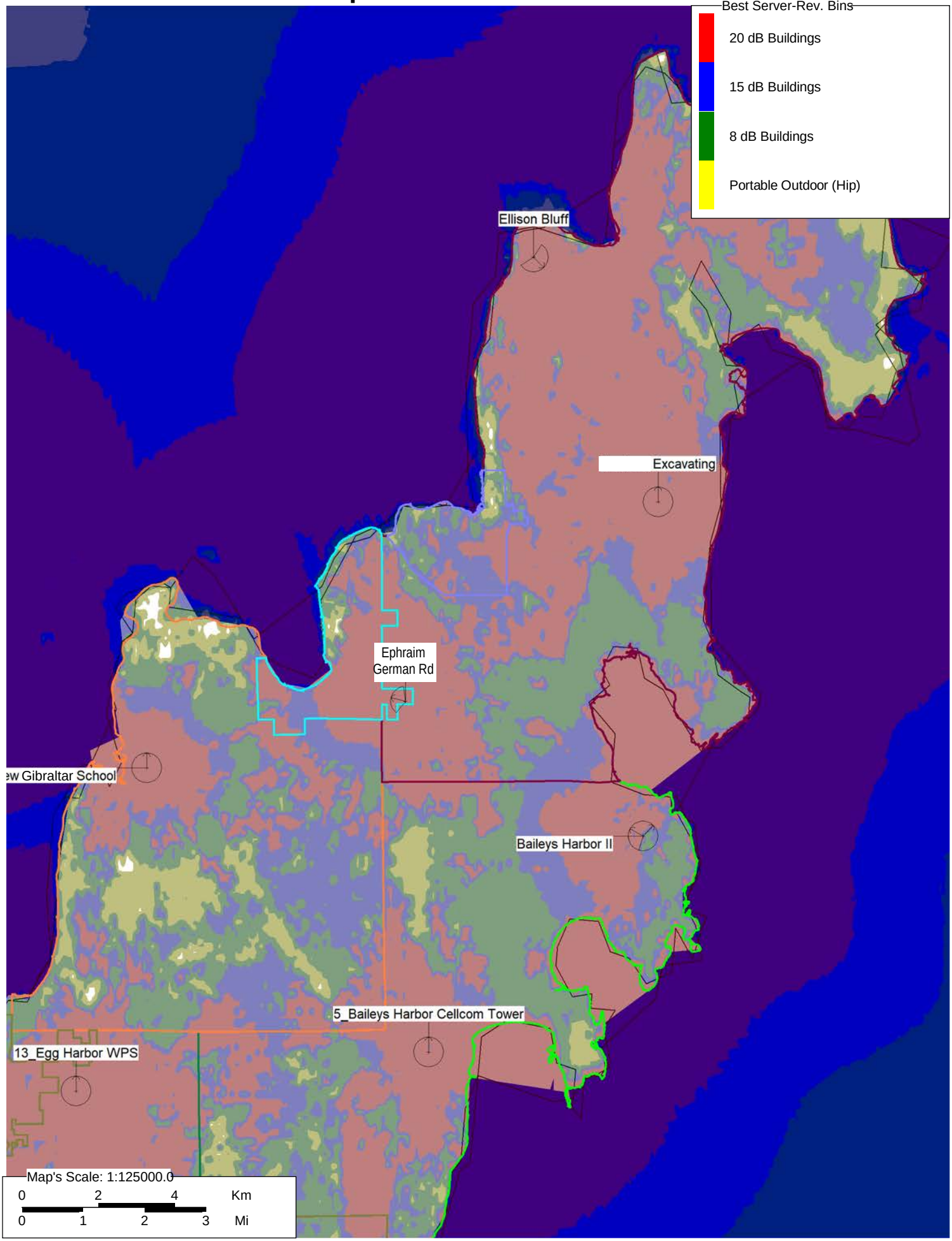
Ellison Bluff-Excavating-Baileys Harbor II and Ephraim Waste Water @ 180’				
Coverage Area	**Portable Outdoor**	**8dB Building**	**15dB Building**	**20dB Building**
Baileys Harbor	99.84	93.69	63.47	41.89
Town of Gibraltar	99.10	85.06	53.24	25.68
Town of Liberty Grove	99.73	94.18	76.14	58.30
Village of Ephraim	98.53	91.15	71.68	64.60
Village of Sister Bay	99.56	92.29	75.33	55.51

Ellison Bluff-Excavating-Baileys Harbor II and Ephraim German Rd @ 180’				
Coverage Area	**Portable Outdoor**	**8dB Building**	**15dB Building**	**20dB Building**
Baileys Harbor	99.84	93.55	63.08	41.87
Town of Gibraltar	98.29	84.64	56.35	27.19
Town of Liberty Grove	99.69	93.96	75.41	56.89
Village of Ephraim	99.26	94.99	83.33	67.99
Village of Sister Bay	99.34	90.09	69.16	31.72

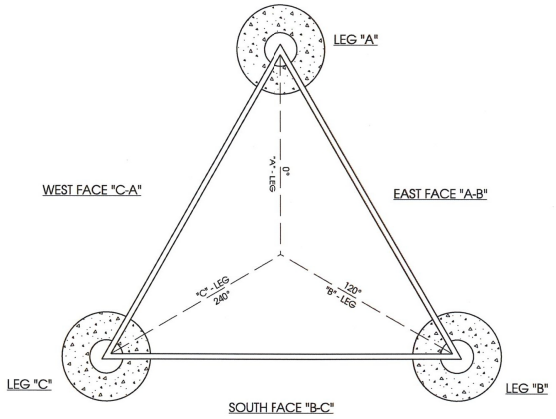
Ephraim Waste Water Site



Ephraim German Road



SAMPLE TOWER DESIGN



A D100 **ANTENNA MOUNTING**

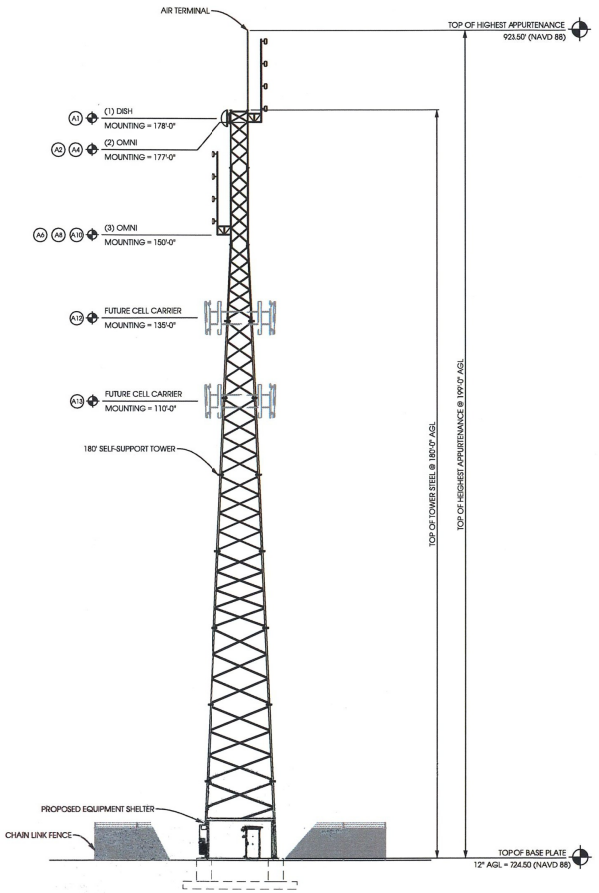
SCALE: 11X17 - 1" = NTS
22X34 - 1" = NTS

TOWER LOADING LEGEND

ANTENNA ID	ANTENNA TYPE	ANTENNA MODEL, DESCRIPTION & (QTY)	TOWER LEG	ANTENNA MOUNT	MOUNTING HEIGHT	CENTERLINE HEIGHT	C/L ELEV. (NAVD 88')	ANTENNA AZIMUTH TO NORTH	TILT (+/-)	TX LINE SIZE	FREQUENCY (MHz)	ERP (watts)	USE OWNER	NOTES
A1	Dish	(1) 4' Diameter	A	(1) 4-1/2" O.D. Mast Pipe Leg Mount	178	178	902.50	34.81	TBD	EW90 (1) 1-5/8"	11 GHz	TBD	MICROWAVE DOOR COUNTY	
A2	Omni	(1) 20' DB SPECTRA DS1F06F36UN	B	6' Truss Frame 2-3/8" Mast Pipe	177	187	911.50	N/A	N/A	AVA5-50 (1) 7/8"	150-164	TBD	MASTER RX #1 DOOR COUNTY	
A3	Omni	(1) 20' COMPROD 874F-70-TM-1/4	B	6' Truss Frame 2-3/8" Mast Pipe	177	187	911.50	N/A	N/A	AVA5-50 (1) 7/8"	TBD	TBD	FUTURE	FUTURE
A4	Omni	(1) 20' DB SPECTRA DS1F06F36UN	C	6' Truss Frame 2-3/8" Mast Pipe	177	187	911.50	N/A	N/A	AVA5-50 (1) 7/8"	150-164	TBD	MASTER RX #2 DOOR COUNTY	
A5	Omni	(1) 20' COMPROD 874F-70-TM-1/4	C	6' Truss Frame 2-3/8" Mast Pipe	177	187	911.50	N/A	N/A	AVA5-50 (1) 7/8"	TBD	TBD	FUTURE	FUTURE
A6	Omni	(1) 20' DB SPECTRA DS1F06F36UN	B	6' Truss Frame 2-3/8" Mast Pipe	150	160	884.50	N/A	N/A	AVA5-50 (1) 7/8"	150-164	TBD	MASTER TX #1 DOOR COUNTY	
A7	Omni	(1) 20' COMPROD 874F-70-TM-1/4	B	6' Truss Frame 2-3/8" Mast Pipe	150	160	884.50	N/A	N/A	AVA5-50 (1) 7/8"	TBD	TBD	FUTURE	FUTURE
A8	Omni	(1) 20' DB SPECTRA DS1F06F36UN	C	6' Truss Frame 2-3/8" Mast Pipe	150	160	884.50	N/A	N/A	AVA5-50 (1) 7/8"	150-164	TBD	MASTER TX #2 DOOR COUNTY	
A9	Omni	(1) 20' COMPROD 874F-70-TM-1/4	C	6' Truss Frame 2-3/8" Mast Pipe	150	160	884.50	N/A	N/A	AVA5-50 (1) 7/8"	TBD	TBD	FUTURE	FUTURE
A10	Omni	(1) 20' COMMFROD 893F-70-TM-1/2	A	6' Truss Frame 2-3/8" Mast Pipe	150	160	884.50	N/A	N/A	AVA5-50 (2) 7/8"	138-174 440-470	TBD	EMERG. MGMT DOOR COUNTY	
A11	Omni	(1) 20' COMPROD 874F-70-TM-1/4	A	6' Truss Frame 2-3/8" Mast Pipe	150	160	884.50	N/A	N/A	AVA5-50 (1) 7/8"	TBD	TBD	FUTURE	FUTURE
A12	Cell Panels	(12) 72" x 12" x 2" Panels	A, B, C	(3) 12' Sector T-Frames	135	135	860	TBD	N/A	(12) 1-5/8"	TBD	TBD	Cell Phone Carrier	FUTURE
A13	Cell Panels	(12) 72" x 12" x 2" Panels	A, B, C	(3) 12' Sector T-Frames	110	110	835	TBD	N/A	(12) 1-5/8"	TBD	TBD	Cell Phone Carrier	FUTURE

NOTES:
1. REFER TO SPECIFICATIONS FOR DESIGN AND STRUCTURAL ANALYSIS REQUIREMENTS.
2. TOWER TO BE DESIGNED AND ANALYZED PER TIA-222- REVISION G. STRUCTURE CLASS "II", EXPOSURE CATEGORY "C", TOPOGRAPHIC CATEGORY "1".
3. DESIGN AND ANALYSIS TO INCLUDE PROPOSED AND FUTURE ANTENNAS, MOUNTS, ICE SHIELDS AND OTHER APPURTENANCES.

B D100 **TOWER LOADING LEGEND**



NOTES:
1. ALL DIMENSIONS SHOWN ARE REFERENCED FROM THE TOP OF TOWER STEEL BASE PLATE.
2. ALL ANTENNAS, DISHES, AND FEED LINES SHALL BE SUPPLIED AND INSTALLED BY OTHERS.
3. ANTENNA & DISH MOUNTS & ICE SHIELDS TO BE PROVIDED AND INSTALLED BY CONTRACTOR
4. FOUNDATIONS SHOWN ARE TYPICAL AND DO NOT REPRESENT ACTUAL CONDITIONS.
5. TOWER & TOWER FOUNDATION - CONTRACTOR IS RESPONSIBLE FOR STRUCTURAL DESIGN OF BOTH ITEMS.
6. AIR TERMINAL MOUNT TO BE BONDED DIRECTLY TO TOWER STEEL.

C D100 **TOWER PROFILE (SOUTH ELEVATION)**

SCALE: 11X17 - 1" = 60'
22X34 - 1" = 30'

Edge Consulting Engineers, Inc.
624 Water Street
Prairie du Sac, WI 53578
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

SHEET TITLE: **TOWER LOADING/ELEVATION**

ISSUE DATE:
11/08/12 - BID DOCUMENTS

REVISIONS:

NO.:	DATE:	DESCRIPTION:

DRAWN BY:
APK
CHECKED BY:
AJO
PLOT DATE:
11/8/2012
PROJECT NUMBER:
7188
FILE NAME:
D100.dgn
SHEET NUMBER:
D100

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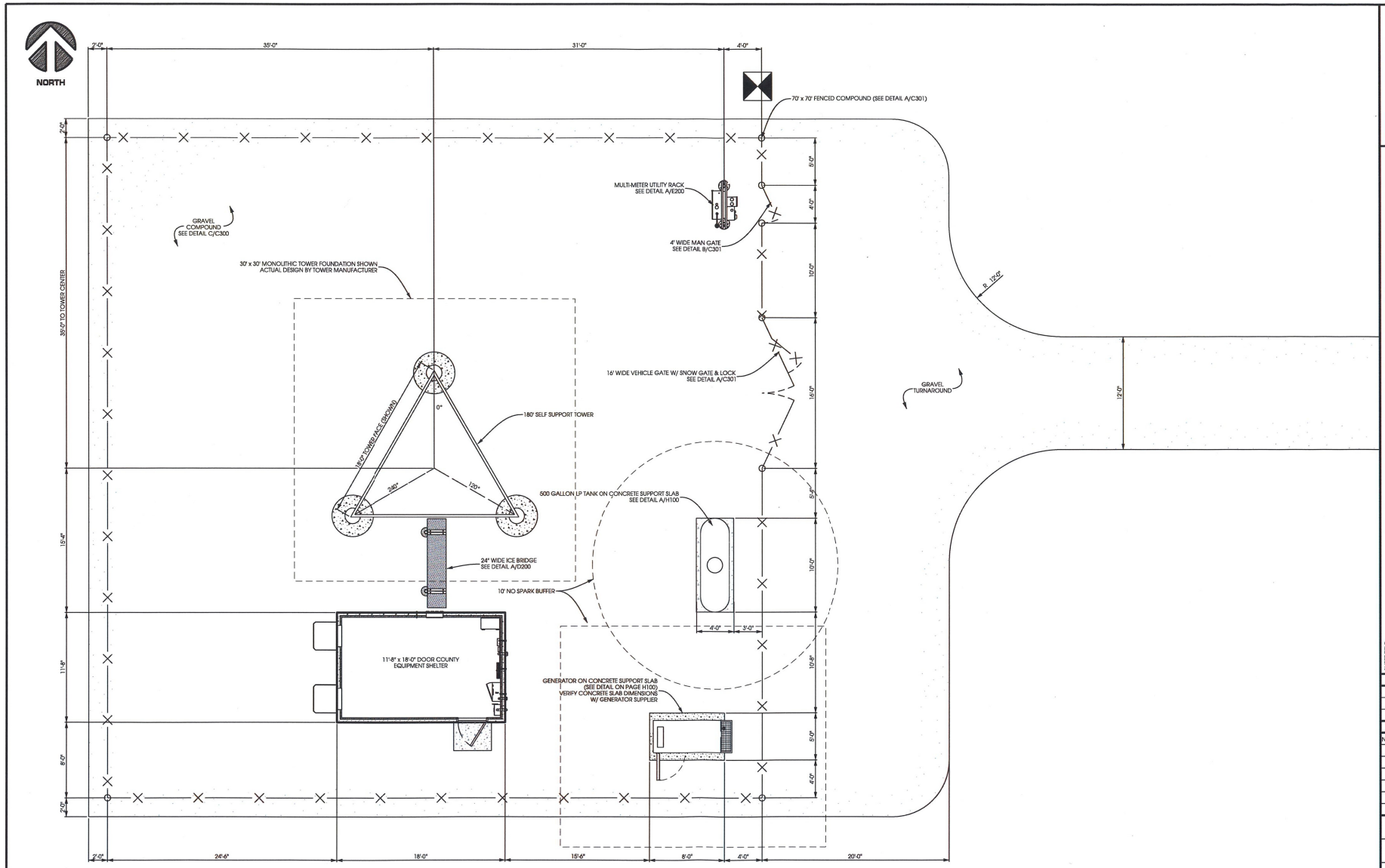
SAMPLE COMPOUND DESIGN



Edge
Consulting Engineers, Inc.
624 Water Street
Prairie du Sac, WI 53578
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www.edgeconsult.com

COMPOUND PLAN

SHEET TITLE:

ISSUE DATE:
11/08/12 - BID DOCUMENTS

REVISIONS:		
NO.:	DATE:	DESCRIPTION:

DRAWN BY: APK
CHECKED BY: AJO
PLOT DATE: 11/8/2012
PROJECT NUMBER: 7188
FILE NAME: C200.dgn

SCALE: 11" x 17" - 1" = 10'
22" x 34" - 1" = 5'

SHEET NUMBER: C200

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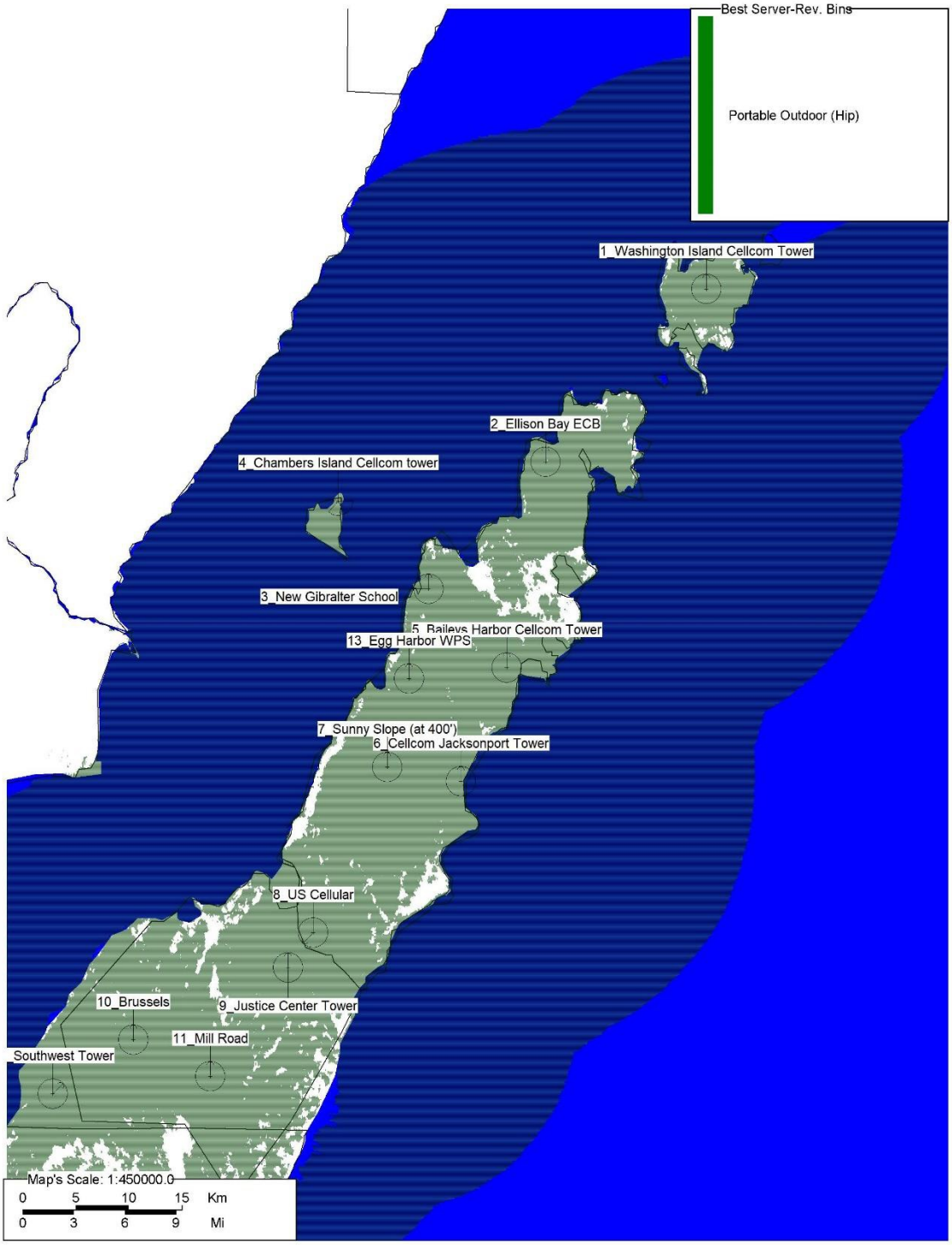
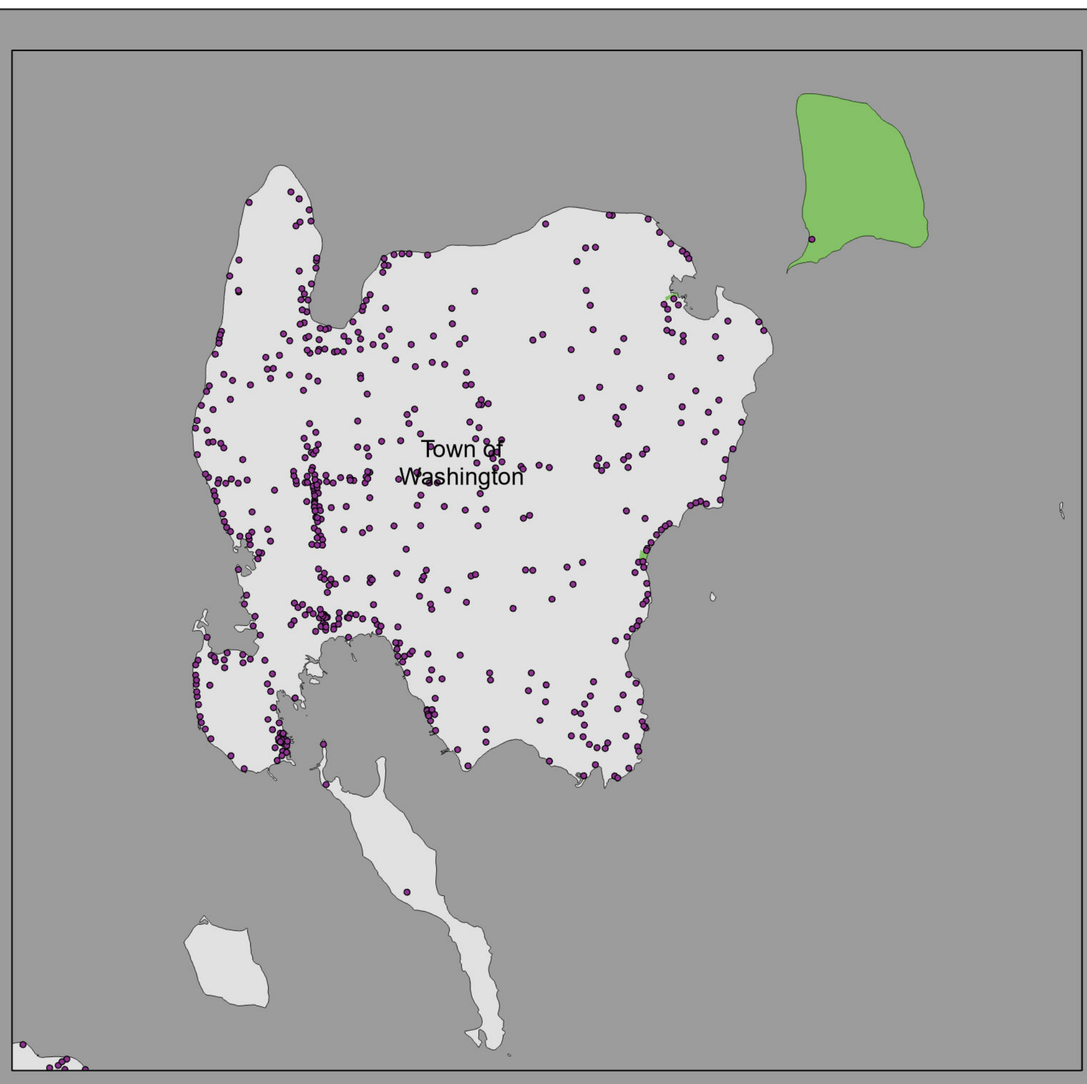
The baseline coverage map if the County of Door simply upgraded to the new UHF system and used only our existing infrastructure. You can see there are definitely some deficient areas along the bluffs throughout the county.



Baseline System

Door County 2018 to 2023 Call Density Heat Map



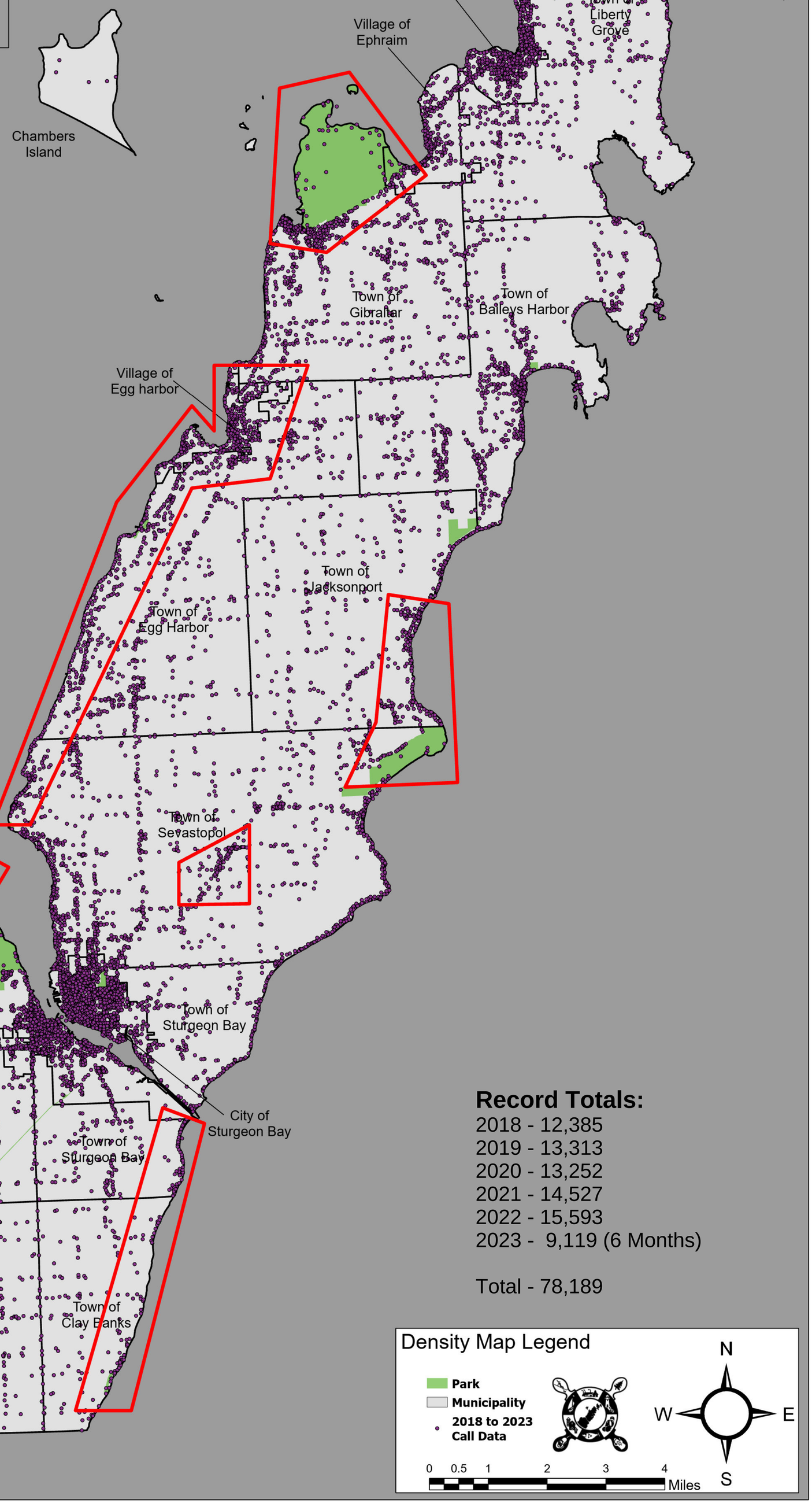
Washington Island

Important Map Information:

This map is a reflection of Door County's call density for 2018 to 2023.

The heat map is derived an export from the Door County Spillman system.

City of Sturgeon Bay	32,362
Village of Egg Harbor	1,548
Village of Forestville	547
Village of Sister Bay	4,387
Village of Ephraim	1,132
Town of Baileys Harbor	3,008
Town of Brussels	1,908
Town of Clay Banks	820
Town of Egg Harbor	3,971
Town of Forestville	1,304
Town of Gardner	2,417
Town of Gibraltar	4,016
Town of Jacksonport	1,730
Town of Liberty Grove	4,201
Town of Nasewaupee	5,193
Town of Sevastopol	5,728
Town of Sturgeon Bay	1,418
Town of Union	1,124
Town of Washington	1,375



Record Totals:

2018 - 12,385
2019 - 13,313
2020 - 13,252
2021 - 14,527
2022 - 15,593
2023 - 9,119 (6 Months)

Total - 78,189

Density Map Legend

Park
Municipality
2018 to 2023 Call Data

0 0.5 1 2 3 4 Miles

N
W E
S

Door County 2018 to 2023 Tower Map

Original Plan Design Coverage

Washington Island

Chambers Island

Ellison Bay

Village of Sister Bay

Town of Liberty Grove

Village of Ephraim

Highway North Shop

Fish Creek

Baileys Junk

Town of Gibraltar

Town of Baileys Harbor

Baileys Harbor

Village of Egg harbor

Egg Harbor

Horseshoe Bay

Town of Jacksonport

Sunnyslope

Town of Egg Harbor

Bayshore Dr

Town of Sevastopol

Sevastopol Dunes Lake

Nsight Existing Tower - South

Justice Center

Town of Nasewaupee

Town of Sturgeon Bay

City of Sturgeon Bay

Town of Gardner

Brussels Hill

Vertical Bridge Clay Banks (Existing)

Mill Road

Town of Forestville

Town of Clay Banks

Town of Union

Southwest/Andreas

Town of Brussels

Density Map Legend

Tower

Tower

New Towers

Door County Overlay

0 0.5 1 2 3 4 Miles

N

W E

S