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September 14, 2021

MR. JEFFREY DANKO
JOHNSON CONTROLS, INC
5757 N. GREEN BAY AVENUE
MILWAUKEE, WI 53209

MR. SCOTT WAHL
TYCO FIRE PRODUCTS LP
1 STANTON STREET
MARINETTE, WI 54143

Via Email Only to jeffrey.howard.danko@jci.com and scott.wahl@jci.com

SUBJECT: Notice of Non-Compliance and DNR Response to *Drinking Water Well Sampling Summary Report - Land Applied Biosolids Area*
JCI/Tyco Biosolids – Multiple Landspreading Fields
BRRTS #02-38-583856

Dear Mr. Danko and Mr. Wahl:

This letter is a notification from the Wisconsin Department of Natural Resource (DNR) to Johnson Controls, Inc. and Tyco Fire Products, LP (JCI/Tyco) that you are out of compliance with Wisconsin Statutes (Wis. Stat.) ch. 292 and Wisconsin Administrative Code (Wis. Adm. Code) chs. NR 700 through NR 799 for the above named site. The letter provides JCI/Tyco with the notice of non-compliance, the DNR's response to JCI/Tyco's *Drinking Water Well Sampling Summary Report – Land Applied Biosolids Area* and clarification on the buffer areas where JCI/Tyco is required to offer per- and polyfluoroalkyl substances (PFAS) sampling to properties with potable wells. The deadlines and directions for the next required actions are summarized at the end of this letter. DNR offers to meet with JCI/Tyco to answer questions on the contents of this letter to be sure that the requirements are understood.

Background

JCI/Tyco is investigating and responding to discharges of PFAS to the environment at its facilities in Marinette, Wisconsin; including its Fire Technology Center (FTC) located at 2700 Industrial Parkway South (BRRTS case #02-38-580694), and its facility located at 1 Stanton Street (BRRTS case #02-38-581955). JCI/Tyco provided information for these BRRTS cases that its wastewater disposal practices at these facilities included the discharge of PFAS-containing aqueous film forming foams (AFFF) and anti-foaming agents to the sanitary sewer system in Marinette, Wisconsin.

Between June and July 2018, the DNR was notified by the city of Marinette of PFAS contamination present in influent wastewater received by the city of Marinette Wastewater Treatment Plant (WWTP) and in biosolids sludge generated by the WWTP. Subsequent testing for PFAS in five sectors of the sanitary sewer system within the city and in groundwater at JCI/Tyco's FTC and Stanton Street facilities linked JCI/Tyco as a source to PFAS contamination in the city of Marinette's WWTP biosolids that were land applied on fields in Marinette and

Oconto counties. Based on review of available data, the DNR determined that 61 fields were approved[1] to accept biosolids from the city of Marinette WWTP from 1997 to 2017. The fields where PFAS-contaminated biosolids from the city of Marinette were land applied between 1997 and 2017 are identified herein as the "Site."

Notice of Noncompliance

On July 3, 2019, the DNR notified JCI/Tyco of its responsibilities to address PFAS contamination at the fields where PFAS-contaminated biosolids from the city of Marinette were land applied, the first step of which was to scope and submit a site investigation work plan.

On October 16, 2019, the DNR issued a notice of noncompliance to JCI/Tyco regarding the Site. JCI/Tyco responded to the notice on October 17, 2019, stating it believed that the DNR must investigate and assess the extent and scope of any biosolids application as the source of PFAS contamination to the Site, and that JCI/Tyco would work with the DNR on such an investigation to avoid lengthy proceedings challenging the authority of the DNR to require this work from JCI/Tyco. In the October 17, 2019 letter, JCI/Tyco asserted that the DNR had not identified contaminants, or the sources of contaminants to the biosolids that were land applied at the Site. On November 4, 2019, the DNR issued a letter to JCI/Tyco with data sources and reminding JCI/Tyco of its legal responsibilities to address the PFAS contamination at multiple fields where PFAS-contaminated biosolids from the city of Marinette were land applied.

On November 19, 2019, the DNR received JCI/Tyco's *Biosolids Landspreading – Phase I Investigation Work Plan* ("Phase I WP"). The Phase I WP did not meet Wis. Adm. Code ch. NR 716 requirements for a site investigation work plan. Following the receipt of the Phase I WP, the DNR and JCI/Tyco discussed prioritizing the sampling of potable wells in-and-around the fields where the Marinette municipal biosolids were land applied. In a letter dated February 18, 2020, the DNR documented that JCI/Tyco agreed to perform sampling of all public and private potable wells (potable wells) within 1,200 feet of the property boundaries of the 61 fields approved to accept biosolids from the city of Marinette WWTP from 1997 to 2017. The DNR's letter reiterated the requirement for JCI/Tyco to submit a site investigation work plan to address all media and migration pathways, but given the weather limitations at the time the letter was written that the DNR supported prioritization of potable well sampling at the Site. The February 18, 2020 letter did *not* constitute an approval to conduct potable well sampling in lieu of a site investigation that complies with the requirements of Wis. Adm. Code ch. NR 716.

JCI/Tyco performed sampling of potable wells at the Site and on September 24, 2020 the DNR received JCI/Tyco's *Drinking Water Well Sampling Summary Report – Land Applied Biosolids Area* ("Report"), documenting the results. The DNR's review of the Report is summarized in the next section of this letter. Generally, the DNR's review determined that PFAS contamination is in the groundwater at the Site, and that field investigation activities meeting the requirements of Wis. Adm. Code § NR 716.11 have not been fulfilled by the potable well sampling described in the Report. Our information indicates that JCI/Tyco has not submitted a site investigation work plan for the Site in accordance with Wis. Adm. Code ch. NR 716 to evaluate all potential pathways for the migration of contamination and to define the degree and extent of contamination occurring as a result of those migration pathways.

Please be aware that the DNR may initiate enforcement action against you for failure to comply with Wis. Stat. ch. 292. Your legal responsibilities are defined both in Wis. Stat. ch. 292 and Wis. Adm. Code chs. NR 700

[1] The DNR is aware that some of these same 61 fields were *also* approved to accept biosolids from the city of Peshtigo WWTP, and that other fields in the area were approved to accept biosolids from *only* the city of Peshtigo. The selection of the fields for this Site did not include an evaluation of landspreading activities completed by the city of Peshtigo.

through 799 and are also described in the July 3, 2019 and November 19, 2019 letters. In particular, Wis. Stat. § 292.11(3), states:

> RESPONSIBILITY. A person who possesses or controls a hazardous substance which is discharged or who causes the discharge of a hazardous substance shall take the actions necessary to restore the environment to the extent practicable and minimize the harmful effects from the discharge to the air, lands, or waters of the state.

The DNR directs JCI/Tyco that **within 60 days from date of this letter, you submit a site investigation work plan in accordance with Wis. Adm. Code ch. NR 716.** Additional information on scoping the site investigation work plan is provided in the "Next Steps" at the end of this letter. You are in noncompliance and will remain in noncompliance until you fulfill the requirements of the statute.

Summary of JCI/Tyco's *Drinking Water Well Sampling Report – Land Applied Biosolids Area*

On September 24, 2020 the DNR received JCI/Tyco's *Drinking Water Well Sampling Report – Land Applied Biosolids Area* ("Report"), describing sampling activities and results of PFAS in potable wells associated with the Site. The Report was accompanied by the appropriate fee of $700, required under Wis. Adm. Code § NR 749.04(1), for formal DNR review and response. The DNR's review also included the following items received from JCI/Tyco (without a fee), which supplemented the information and conclusions presented in the Report:

- April 30, 2020: A preliminary evaluation of the cause and significance of PFAS in drinking water wells, titled *Initial Evaluations of Land-spread Biosolids in Marinette and Oconto Counties* ("Initial Report"). JCI/Tyco submitted the Initial Report to document its progress on the sampling effort completed prior to temporary delays that were experienced because of Covid-19 restrictions.
- December 16, 2020: Evaluation of potable wells sampling results compared to the Wisconsin Department of Health Services' (DHS) recommended groundwater standards for PFAS that were issued on November 6, 2020 ("Cycle 11").
- February 3, 2021: List of properties where owners refused sampling, properties where JCI/Tyco determined there was no potable well and properties where owners were non-responsive and the presence of a well could not be confirmed.
- March and May 2021: Data notifications with results for PFAS sampling from five private drinking water wells at the Site that were not previously sampled.

Between March 2020 and April 2021, after reaching out to 345 property owners to offer potable well sampling, JCI/Tyco sampled 191 private potable wells at the Site. The Report included a summary of outreach activities conducted to identify wells for testing, figures identifying the 61 fields and surrounding areas where well testing activities took place, tables with the PFAS results for 186 wells[2] and figures showing the sample locations.

In the Report, JCI/Tyco compared the sampling results to the DHS's Cycle 10 recommended groundwater quality standards of 20 parts per trillion (ppt) for perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) combined. Following submittal of the Report, the DHS's Cycle 11 recommended groundwater standards were released, and in December 2020 JCI/Tyco submitted a supplemental evaluation comparing the results to the Cycle 11 recommended groundwater standards. The results of the evaluation, including the five additional wells

[2] In the Report, JCI/Tyco stated 183 wells were sampled; however, the DNR counted results for 186 wells. After submitting the Report, JCI/Tyco sampled five more wells to respond to later requests for sampling it received from property owners.

that JCI/Tyco sampled in 2021, are summarized in the table below. The maximum PFOA concentration detected was 2,200 ppt and the maximum PFOS concentration was 94 ppt.

Criteria	Number of Wells
No PFAS Detected	31
PFAS < DHS Cycle 11 Recommended Groundwater Standard	130
PFAS ≥ DHS Cycle 11 Recommended Groundwater Standard	30

JCI/Tyco provided the sampling results to each property owner/resident. JCI/Tyco is providing bottled water to residents whose wells contained PFAS at or above the Cycle 11 recommended groundwater standards and who accepted the offer of bottled water. JCI/Tyco did not provide a long-term monitoring plan for the impacted wells.

JCI/Tyco's Initial Report submitted to the DNR in April 2020 was for 98 potable wells. In the Initial Report, JCI/Tyco identified seven wells with sample results exceeding the DHS's Cycle 10 recommended groundwater quality standards of 20 ppt for PFOS and PFOA combined. JCI/Tyco also provided a preliminary evaluation of sources of PFAS detected in the seven wells, which included a summary of the concentrations of PFOA and PFOS, well depth (if known), depth to bedrock (if known) and volume of biosolids applied (in gallons) to fields near the well. JCI/Tyco indicated that these and other data would be reviewed and summarized in the Report to assess the cause and significance of the PFAS detected in the potable wells sampled at the Site. The other available information suggested by JCI/Tyco included: United States Geological Survey (USGS) topographic maps and Wisconsin Light Detection and Ranging (LiDAR) topographic maps to determine drainage conditions for fields, USGS and United States Department of Agricultural maps to assess soil conditions in the area and USGS plats to provide some information on presumed groundwater flow directions.

A comparable evaluation and the review of additional data suggested in the Initial Report were *not* included in the Report JCI/Tyco submitted in September 2020. In the Report, JCI/Tyco summarized the potable wells results and concluded that the land applied biosolids were concentrated in isolated areas and were not causing widespread contamination; however, JCI/Tyco did not provide an evaluation of the data to support this conclusion.

DNR Review of JCI/Tyco's *Drinking Water Well Sampling Report – Land Applied Biosolids Area*

The DNR reviewed the Report and finds there was insufficient evaluation of available data to support conclusions on the cause and significance for wells with PFAS detections. Furthermore, JCI/Tyco's potable well sampling was done to identify potential human health exposure to PFAS at the Site, and was not designed to answer questions on the degree and extent of contamination as required by Wis. Adm. Code ch. NR 716. If JCI/Tyco wants to use the potable well sampling results to help scope the site investigation, then an evaluation of the available data is required per Wis. Adm. Code § NR 716.07.

Data evaluations missing from the Report that would support development of scope for the site investigation are provided below. This is not an exhaustive list and JCI/Tyco and its consultants may identify other information to support the evaluation.

- ***Biosolids land application rates and volumes***

  In the Initial Report, JCI/Tyco included the volumes of biosolids that were land applied to fields for locations where potable wells exceeded DHS's recommended groundwater standards; however, this information was not provided in the Report. Information on date, location and volumes of land applied biosolids can be obtained from the city of Marinette's annual land applications reports. An analysis of

how the volume and timeframe that biosolids were land applied on a particular field should be examined to determine if there are correlations between biosolids application rates, dates, and PFAS detections in the potable wells. (This evaluation should also incorporate other data identified below such as depth of the potable well, geology and soil conditions, and proximity of the well to the landspreading field.)

- ***Other sources (septic and/or industrial)***

  JCI/Tyco did not provide data or evidence to support other PFAS sources to potable wells where PFAS were detected at the Site.

  In the Initial Report JCI/Tyco asserted that the source of the PFAS in some potable wells was from septic tanks, but it did not describe or provide data to support interpretations and conclusions. In Section 5.2 of the Report, JCI/Tyco stated that information on septic systems for each property was obtained as part of the potable well sampling, but did not include this data in the Report or explain if and how the data was used to draw conclusions on PFAS sources to impacted potable wells. Further testing of septic leach fields and evaluation of septic systems construction and location relative to the potable wells would be needed to substantiate septic systems as a contributing source of PFAS in a potable well.

  In the Report, JCI/Tyco stated that public records and data indicate PFAS from numerous industrial facilities are likely sources contributing PFAS to the WWTP; however, no other sources of PFAS were identified in the Report. Information and data on other potential sources must be cited by JCI/Tyco to substantiate these statements.

  When JCI/Tyco scopes the site investigation, more definitive identification of specific sources of PFAS might be possible with emerging laboratory analytical methods, such as nontargeted analysis for all substances that may be present, total oxidizable precursor assay, analysis of isomers of specific substances and analysis of stable isotopes.

- ***PFAS Signature Analysis***

  JCI/Tyco is a known source of PFAS that discharged to the sanitary sewer in city of Marinette, and the PFAS sampling results continue to indicate JCI/Tyco as a source of the PFAS detected at the Site. For example, two fluorotelomer sulfonates (FTSs), 8:2 FTS and 6:2 FTS are known components (or intermediate environmental degradation products) of JCI/Tyco's Ansul-AFFF products (Harding-Marjonovic et al., 2015)[3], and both have been detected in groundwater and soil samples on JCI/Tyco's FTC site. 6:2 FTS and 8:2 FTS can degrade under aerobic environmental conditions to five perfluorocarboxylic acids (PFCAs) with four to eight carbons. These five PFCAs comprise a prominent signature and account for 95 percent of the total PFAS mass detected in the potable wells at the Site. This suggests a common source of the PFAS, rather than isolated point sources, with JCI/Tyco's AFFF products as the plausible source.

  The Report only discusses PFAS sample results with respect to PFOS and PFOA. The DNR recognizes that at the time that the report was submitted, these two analytes were the only PFAS with recommended

[3] Harding-Marjanovic, K.C., Houtz, E.F., Yi, S., Field, J.A., Sedlak, D.L., Alvarez-Cohen, L., 2015. Aerobic Biotransformation of Fluorotelomer Thioether Amido Sulfonate (Lodyne) in AFFF-Amended Microcosms. Environ. Sci. Technol. 49, 7666–7674. https://doi.org/10.1021/acs.est.5b01219

groundwater quality standards (Cycle 10); however, JCI/Tyco analyzed for 36 PFAS compounds and these other compounds should be used in the evaluation of the PFAS signature.

- ***PFAS variability by media***

  The Report suggests that some of the composition of detected PFAS are not associated with JCI/Tyco operations (e.g., PFOS). The PFAS formulations used at JCI/Tyco's facilities, which then discharged to the Marinette WWTP, varied with time. PFOS was detected in the groundwater at the FTC and Stanton Street sites, suggesting PFOS sources at both JCI/Tyco facilities.

  More importantly, the PFAS compositions are expected to vary in groundwater and biosolids-amended soils, due to differences in PFAS partitioning and in the degradation of precursors. It is possible that leaching conditions, partitioning and the decay of PFAS might vary from field to field. Further evaluation of available scientific research or site-specific testing is needed to better understand changes in PFAS composition by media.

- ***Well construction details***

  In Section 8.2 of the Report, JCI/Tyco stated that available well construction information was gathered and reviewed. JCI/Tyco provided a summary of the unique well IDs for sampled wells, but did not include any information available on well depths, construction or local geology. The available well construction details and the location and distance of wells relative to the landspreading fields should be summarized and evaluated to look for correlations with the PFAS sampling results.

- ***Regional geology, soil conditions, and groundwater flow conditions***

  In the Initial Report, JCI/Tyco provided some information on soil drainage conditions and groundwater flow and indicated that available data on field drainage and regional geology and groundwater flow would be used to evaluate the cause and significance of PFAS detections in wells in the areas where biosolids were land applied. These additional evaluations on soil, geology, and groundwater were not provided in the Report. In the Report, JCI/Tyco summarized regional geology; however, JCI/Tyco did not present if and how the geologic information was used in the evaluation of the potable well sampling results. Information on regional conditions should be used to evaluate cause and significance in the current potable well sampling results and can be used to scope the Wis. Adm. Code ch. NR 716 site investigation work plan.

The data presented in the Report shows that potable wells are impacted with PFAS at the Site. Therefore, to address risk to drinking water receptors at the Site, JCI/Tyco must complete additional sampling, including step-out sampling from potable wells that had concentrations greater than the Cycle 11 recommended groundwater standards and/or a hazard index (HI) greater than or equal to 1.0 (Wis. Adm. Code § NR 716.11(4) and (5)(b)), and must submit a long-term monitoring plan that outlines criteria and frequency for sampling potable wells at the Site (Wis. Adm. Code § NR 716.17(1)). Additional information is provided in the "Next Steps" at the end of this letter.

Buffer Analysis

In the February 18, 2020 letter the DNR directed JCI/Tyco to perform sampling of potable wells within 1,200-ft of property boundaries of the known fields where the city of Marinette municipal biosolids were land applied. The information JCI/Tyco received on the locations of the approved landspreading fields may have been difficult to interpret. With that in mind, the DNR mapped the 61 fields approved to accept biosolids from the city of

Marinette WWTP; applied the 1,200-ft buffer to the property boundaries containing those fields; and then compared the results to the buffers JCI/Tyco used to identify potable wells for sampling. The maps showing this comparison in the buffer areas are included in **Attachment A**.

Differences were identified in the extent of the buffer areas. For example, the property containing well BWS-009 was permitted to receive biosolids and JCI/Tyco applied a buffer to this single parcel; however, the boundary of field approved to receive biosolids extends east onto a second 40-acre parcel. This resulted in a buffer that did not extend far enough to the east, and potentially, potable wells that were not included in the sampling program. Therefore, the DNR directs JCI/Tyco to complete additional analysis to ensure that 61 landspreading fields were adequality buffered and that all potential potable wells within 1,200-ft of the property boundary containing fields that reported received biosolids are offered sampling (Wis. Adm. Code § NR 716.11(5)(b)). The DNR is transmitting an electronic file of the 1,200-ft buffer from applicable property boundaries with this letter for JCI/Tyco to use in this analysis.

Next Steps

You are in noncompliance and will remain in noncompliance until you fulfill all requirements of the statute. The DNR offers to meet with JCI/Tyco to answer questions on the contents of this letter to be sure that the requirements are understood. **The DNR is prepared to hold a virtual meeting the week of October 4, 2021**. The meeting agenda would be limited to questions and answers on next steps and scoping the site investigation; whereas technical evaluations that JCI/Tyco wishes to present for review must be submitted to the DNR in the site investigation work plan described below (Wis. Adm. Code § NR 716.09(2)(d)). Presentations to DNR do not constitute a submittal.

1. Within **45-days** of receipt of this letter, submit a **potable well sampling plan** to investigate the impacts of the PFAS contamination to potential receptors (Wis. Adm. Code § NR 716.11(5)(b)).
    a. Re-evaluate the 1,200-ft buffer applied around the 61 fields. Identify additional potable wells within the buffer that were not previously offered sampling; include these in the sampling plan.
    b. Apply a step-out buffer of 1,200-ft from potable wells with sampling results greater than or equal to the Cycle 11 recommended groundwater quality standards and/or a HI ≥ to 1.0. Identify potable wells within the step-out buffer; include these in the sampling plan.
    c. Include maps that show the property boundaries and buffers described above and all potential potable wells falling within the buffer zones. Identify wells to be sampled and wells previously sampled wells with categories (PFAS not-detected, PFAS < Cycle 11 and HI < 1.0, and PFAS ≥ Cycle 11 and/or HI ≥ 1.0). Identify locations (approximate) of potable wells where property owner refused sampling or where presence of a potable well could not be confirmed because owners did not respond to offers for sampling.
2. Within **60-days** of receipt of this letter submit a **potable well long-term monitoring plan** that includes monitoring criteria and frequency, and plans for supplying alternative water at the Site (Wis. Adm. Code § NR 716.17(1)). Notify affected community members of the plan (Wis. Adm. Code § NR 714.07).
3. Within **60-days** of the receipt of this letter, submit a **site investigation work plan** (Wis. Adm. Code § NR 716.09). DNR outlined the requirements for the site investigation to address all media and migration pathways in previous correspondence (see DNR's July 3, October 16 and November 4, 2019 letters). Data evaluations used to scope the site investigation must be included with the appropriate supporting information in the work plan (Wis. Adm. Code § NR 716.09(2)(d)). Data evaluations may include those described above and/or others that JCI/Tyco and its consultants select.

Failure to take the actions required by Wis. Stat. § 292.11 to address this contamination will cause the DNR to consider this case for additional enforcement actions including referral to the Department of Justice. Please be aware Wis. Stat. § 292.99(1) authorizes the Department of Justice to seek penalties of up to $5,000 per day and Wis. Adm.

Code § NR 728.05 authorizes the DNR to seek penalties for violations of applicable rules, including Wis. Adm. Code ch. 716 site investigation requirements. Additionally, please be advised that the DNR is authorized under Wis. Stat. § 292.94 to assess non-reimbursable fees for any reports you are required to submit as part of additional enforcement actions.

If you have any questions about this letter, or wish to set up the proposed meeting, please contact me, the DNR Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

Sincerely,

Alyssa Sellwood, PE
Complex Sites Project Manager
Remediation & Redevelopment Program

Attachments: Attachment A- Maps with comparison of DNR and JCI/Tyco's buffer analysis

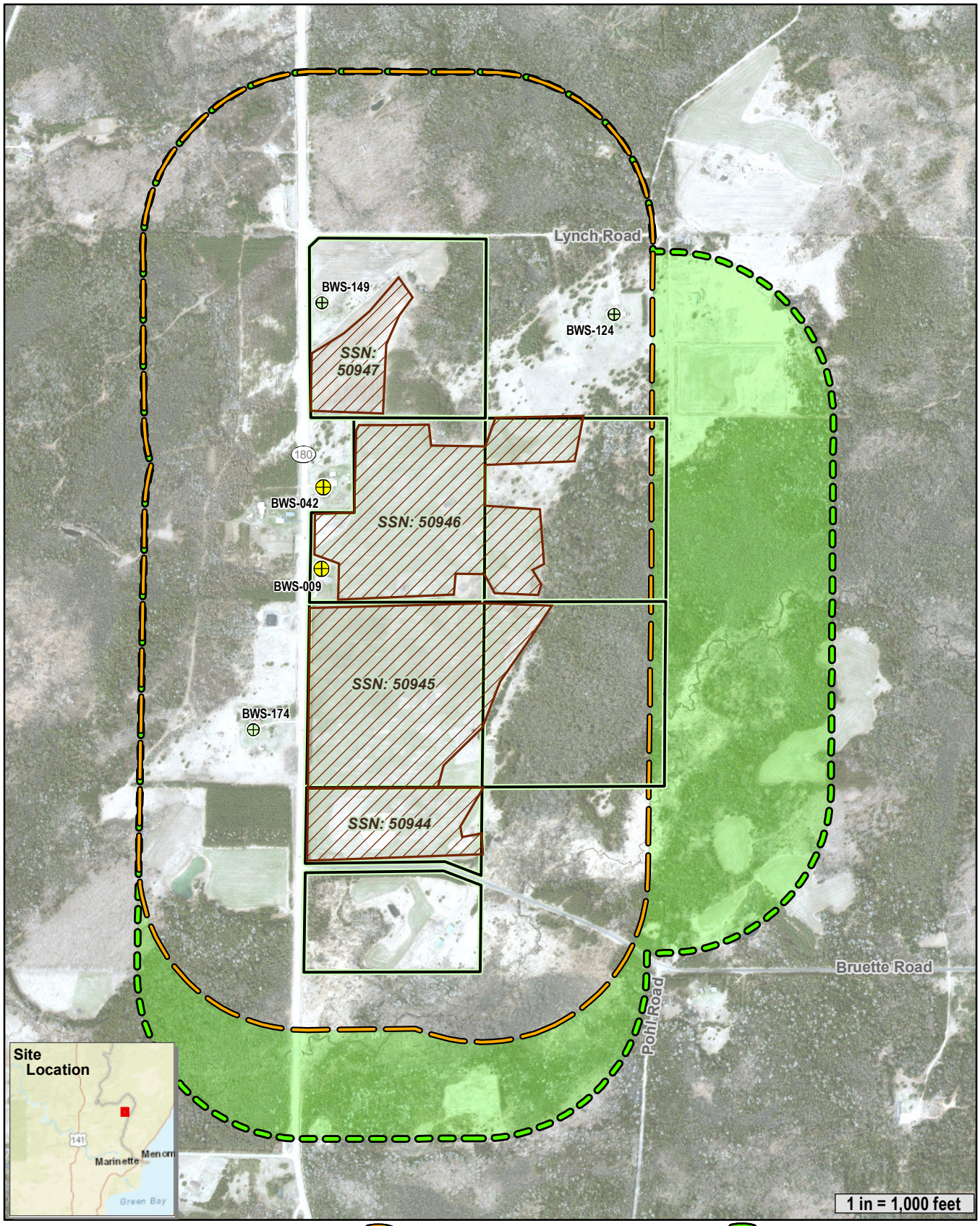
cc: Bridget Kelly, DNR (via email: bridgetb.kelly@wisconsin.gov)
Jodie Peotter, DNR (via email: Jodie.peotter@wisconsin.gov)
Alexis Heim Peter, DNR (via email: Alexis.Peter@wisconsin.gov)

JCI/Tyco BRRTS 02-38-583856

Potable Well PFAS Sampling Areas Near Biosolid Landspreading Fields

September 2021

Remediation & Redevelopment Program
Wisconsin Department of Natural Resources



JCI/Tyco sampled potable well (Mar. 2020 - Apr. 2021)
(Well locations and results provided by JCI/Tyco)

- PFAS not detected
- PFAS < proposed Cycle 11 groundwater standards
- PFAS >= proposed Cycle 11 groundwater standards

- JCI/Tyco provided 1,200' buffer (initial buffer)
- LAG biosolid field (see note)
- Property boundary with field approved for landspreading city of Marinette biosolids

- 1,200' buffer from applicable property boundary
- Buffer area to be added to JCI/Tyco's study

NOTE: LAG is DNR's Land Application Geo-database. LAG areas are based on desktop review, legal descriptions and landowner-provided information and are for reference purposes only. The mapped areas are not necessarily reflective of where biosolids were spread, but are those areas suitable for sewage sludge spreading pursuant to ch. NR 204 requirements that the city of Marinette was approved to use.

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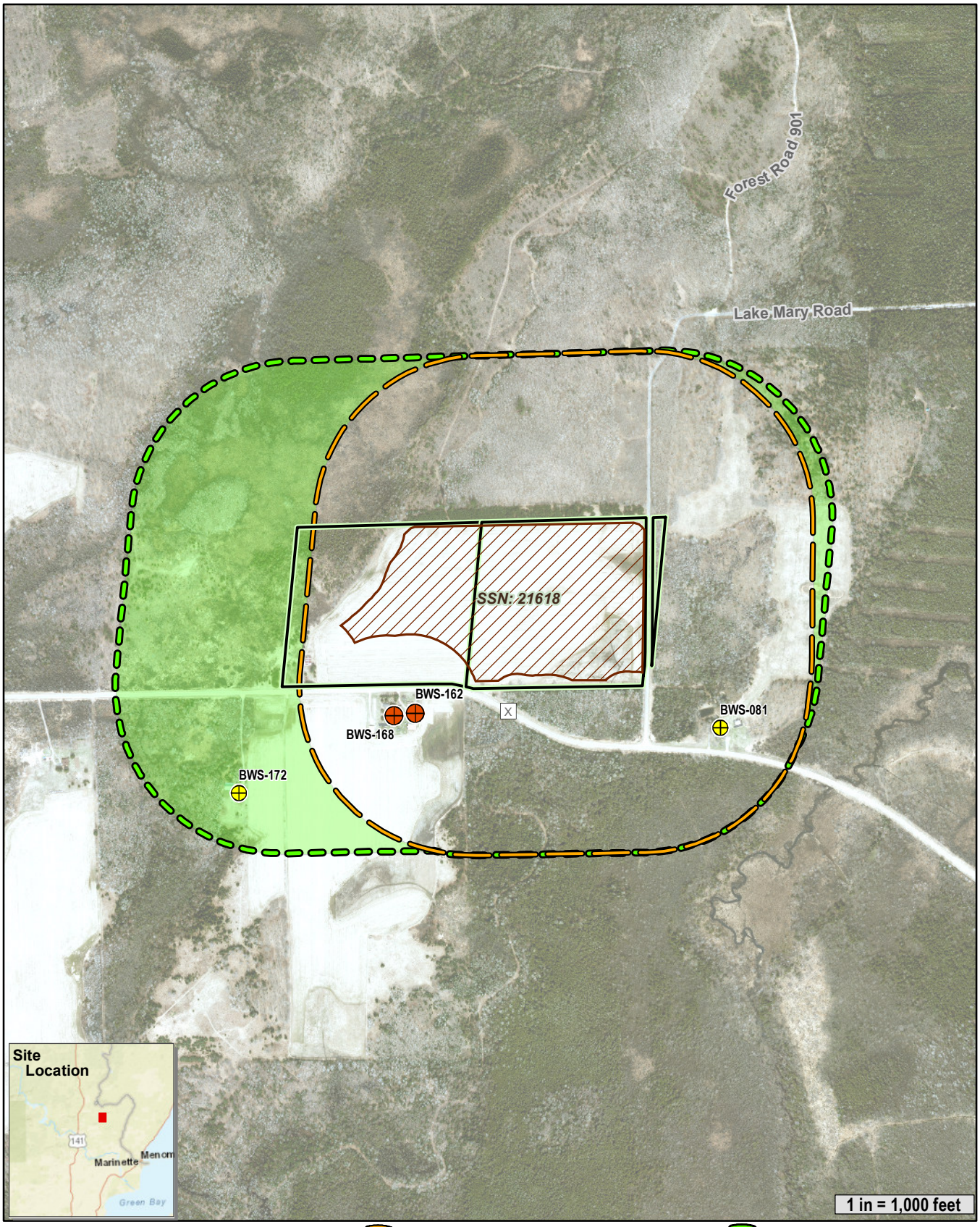

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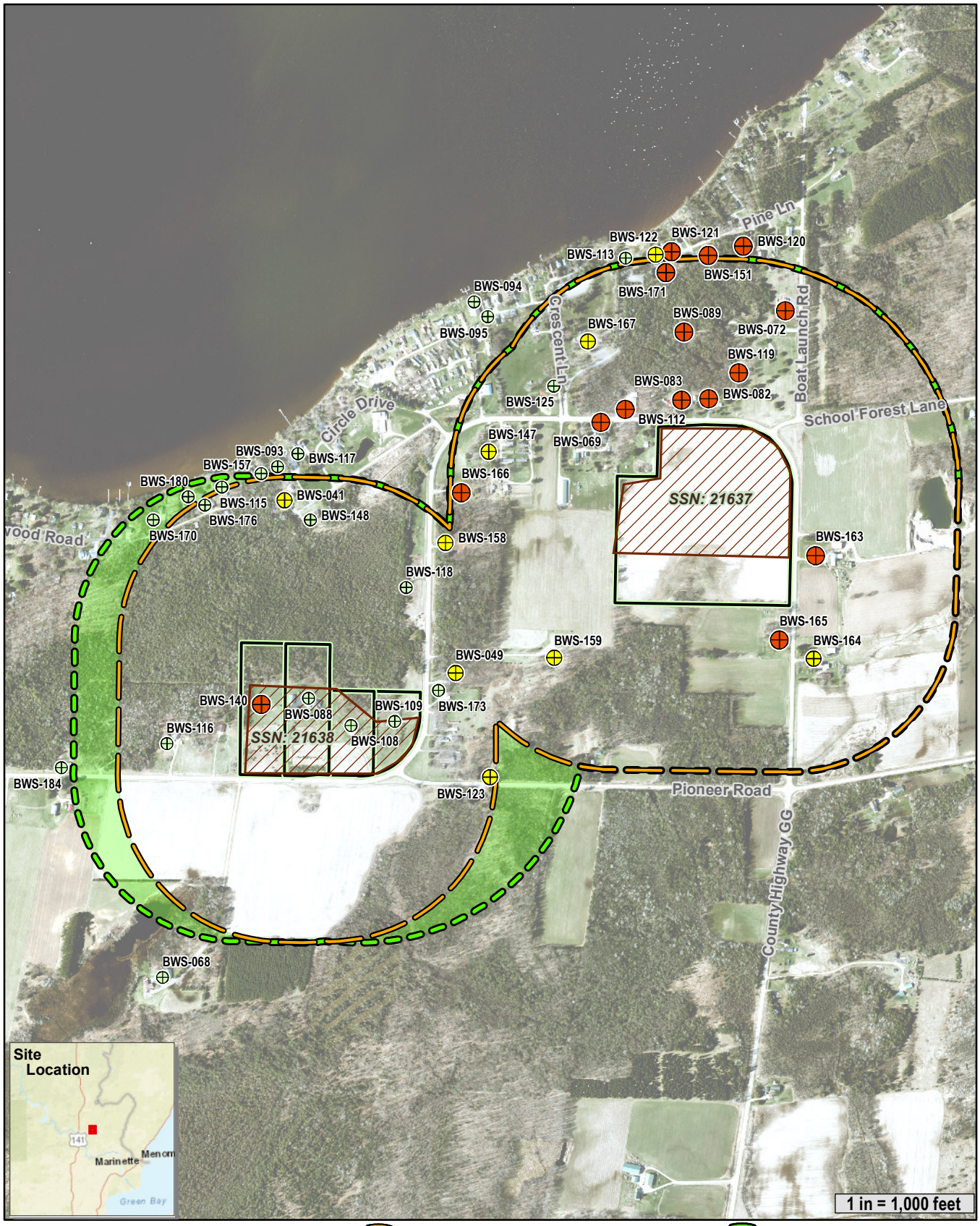

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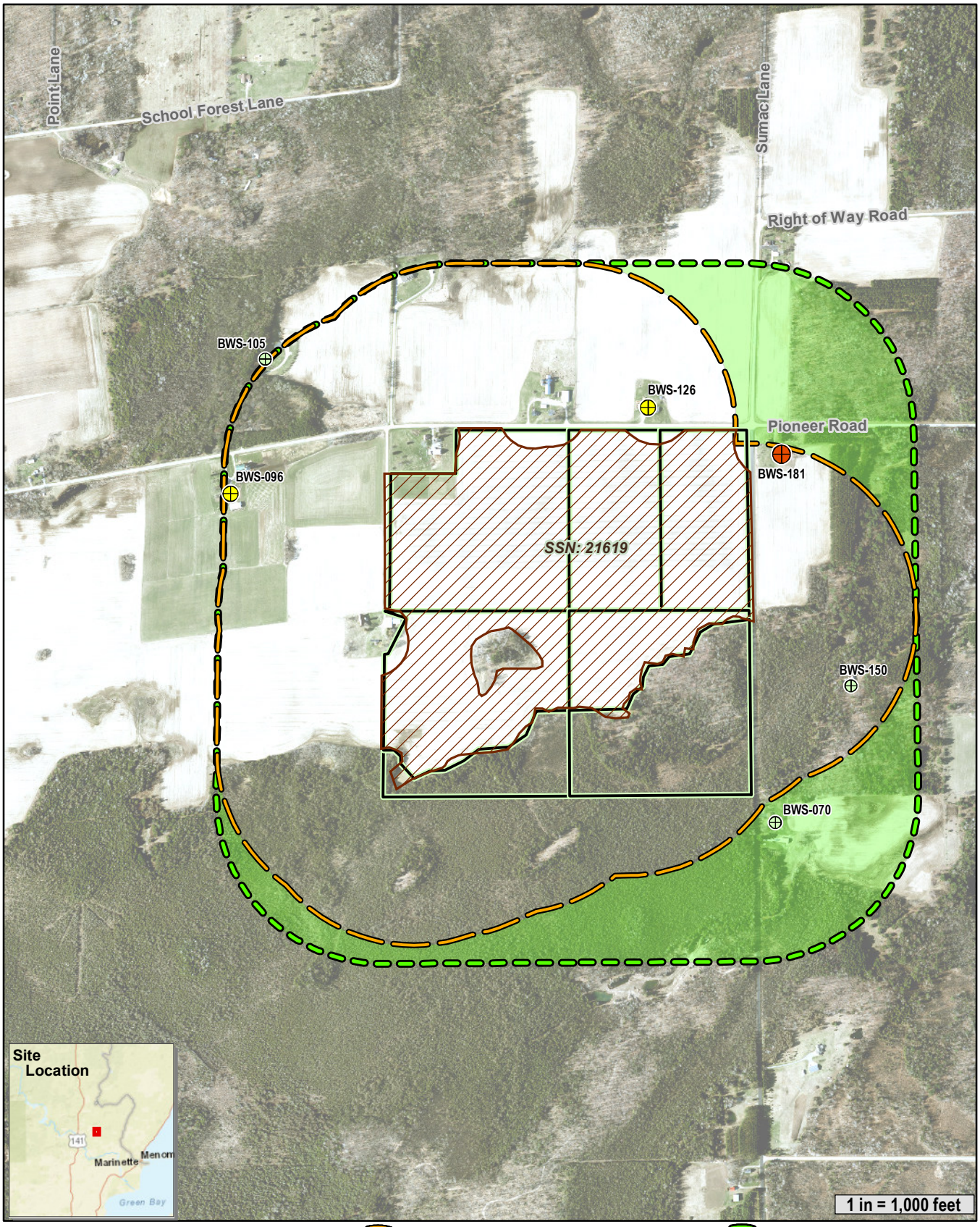

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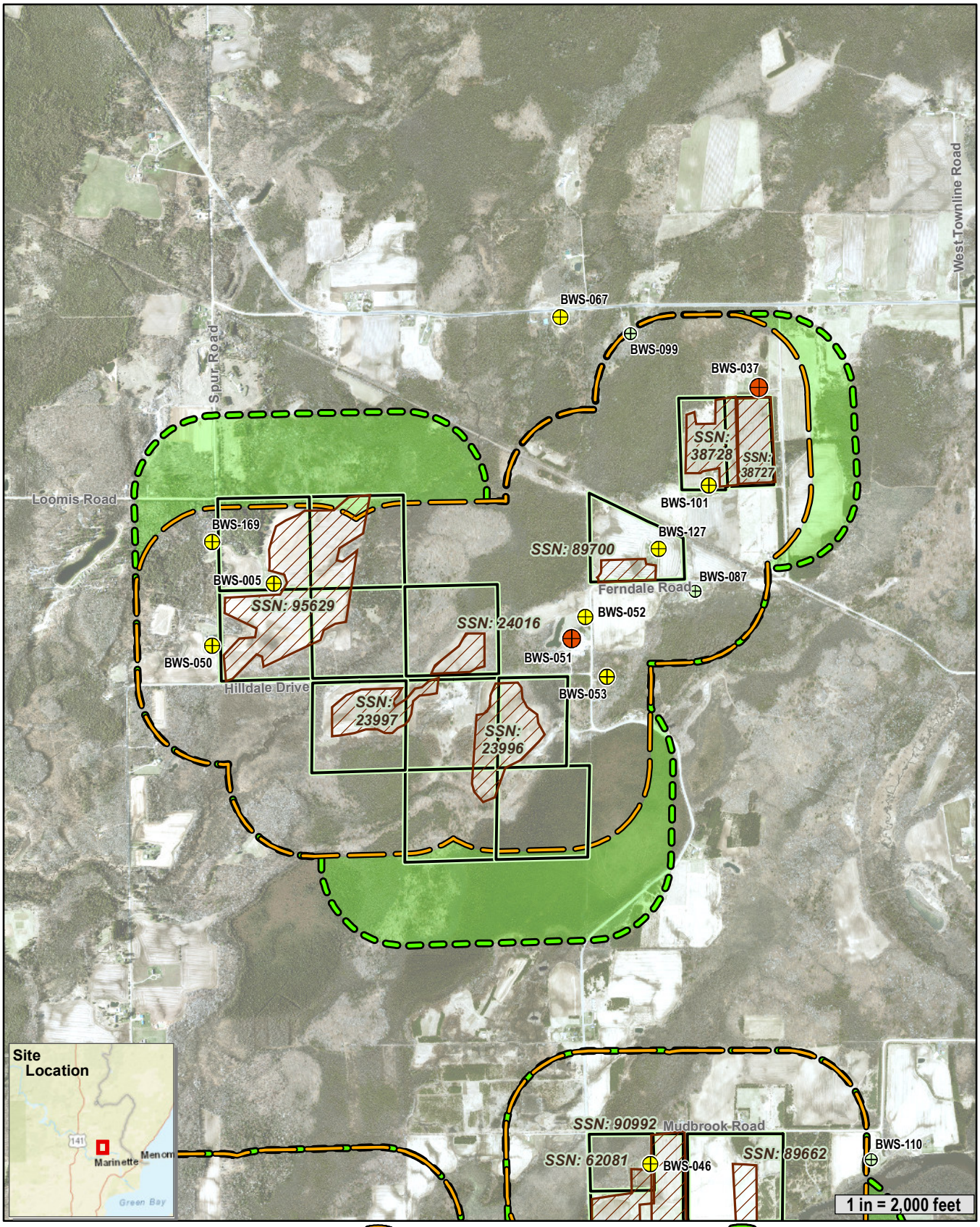

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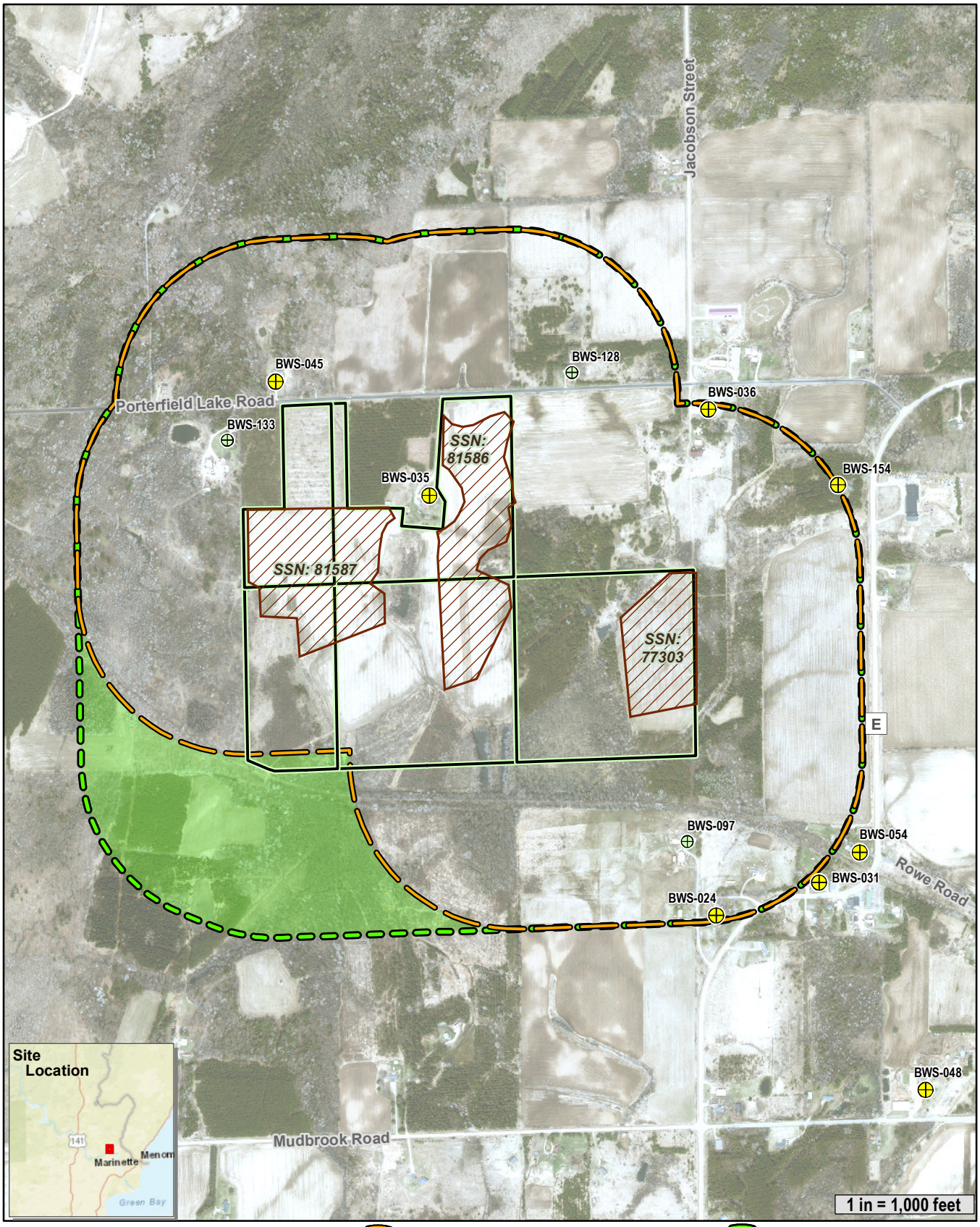
JCI/Tyco BRRTS 02-38-583856

Potable Well PFAS Sampling Areas Near Biosolid Landspreading Fields

September 2021

Remediation & Redevelopment Program
Wisconsin Department of Natural Resources



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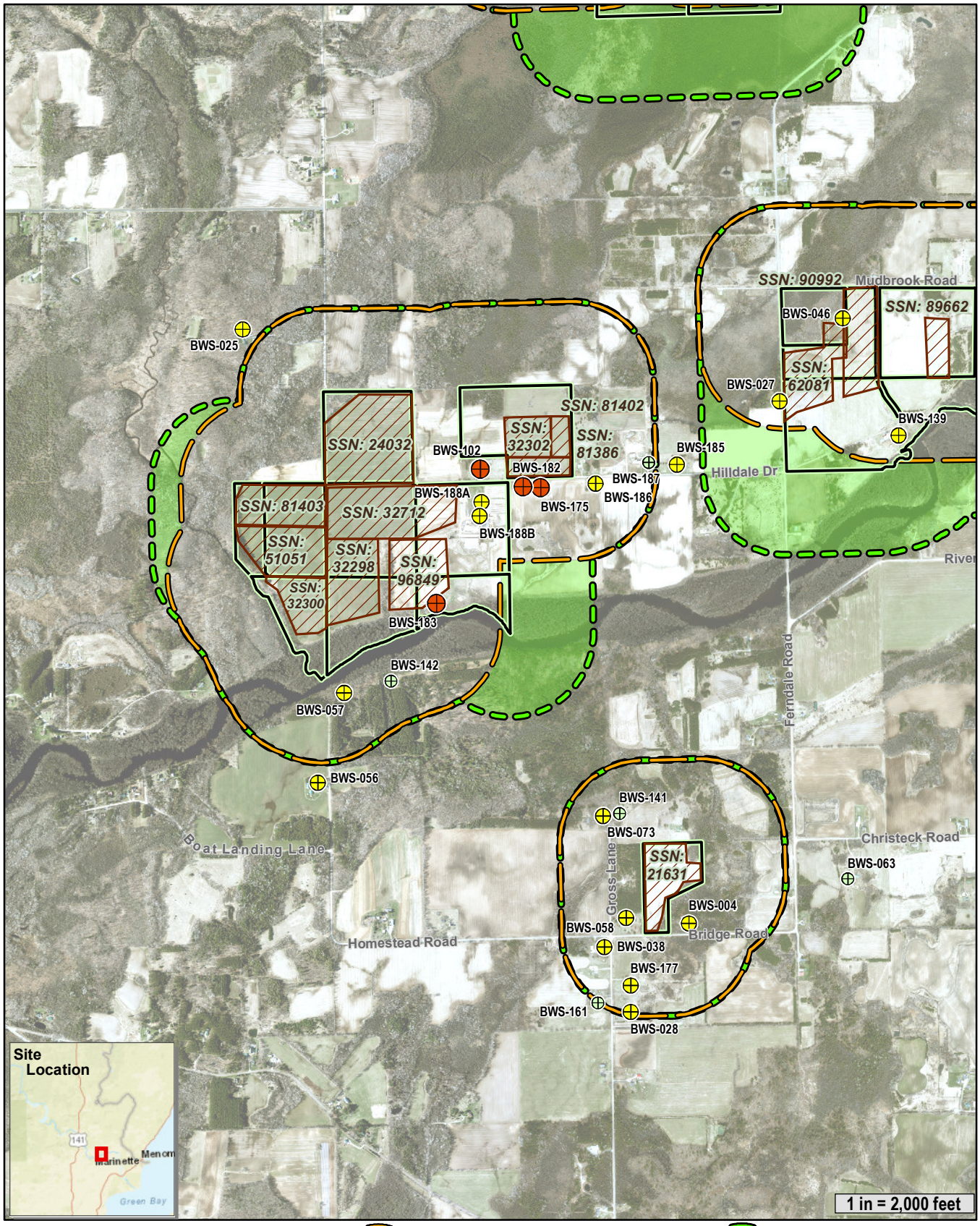

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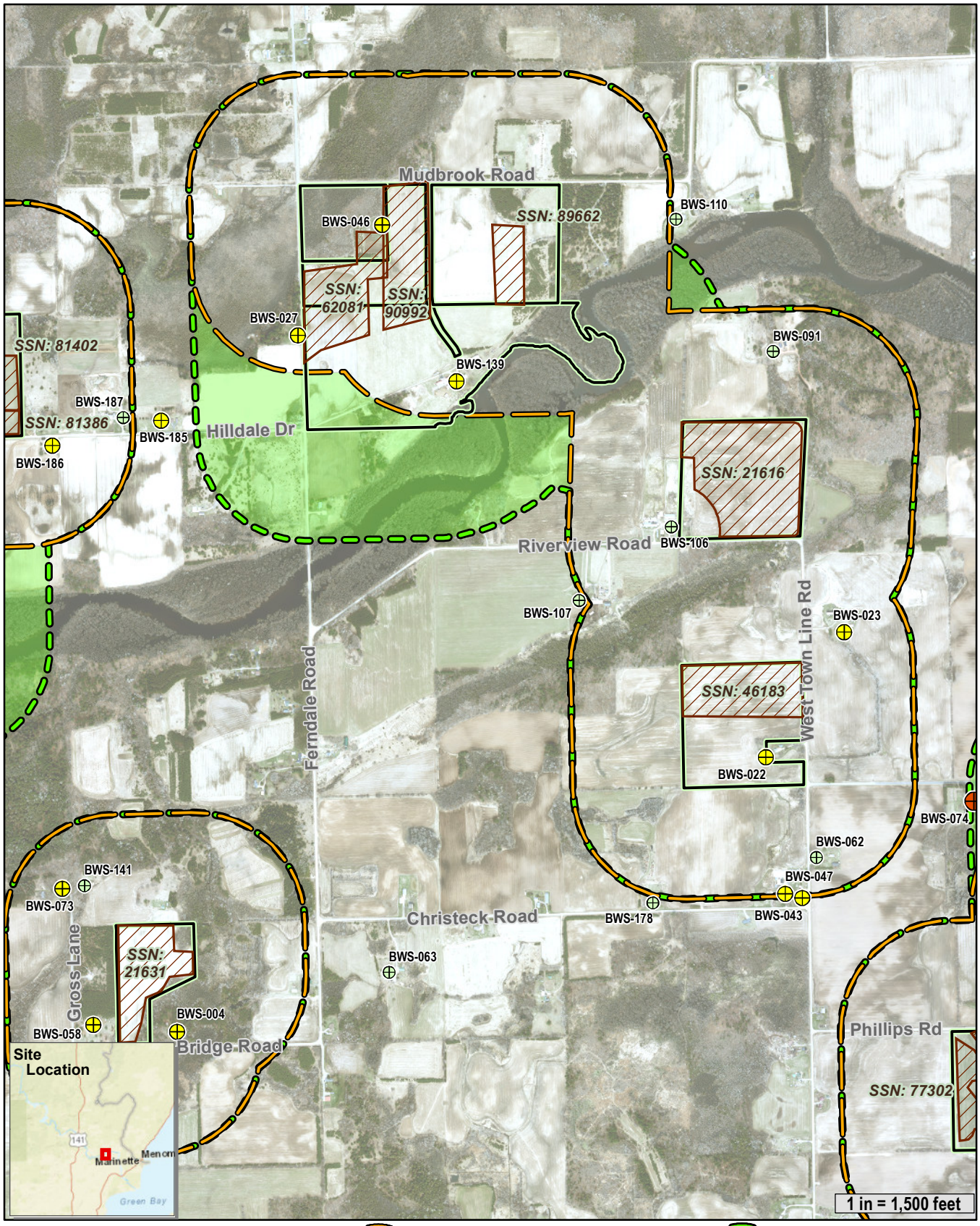

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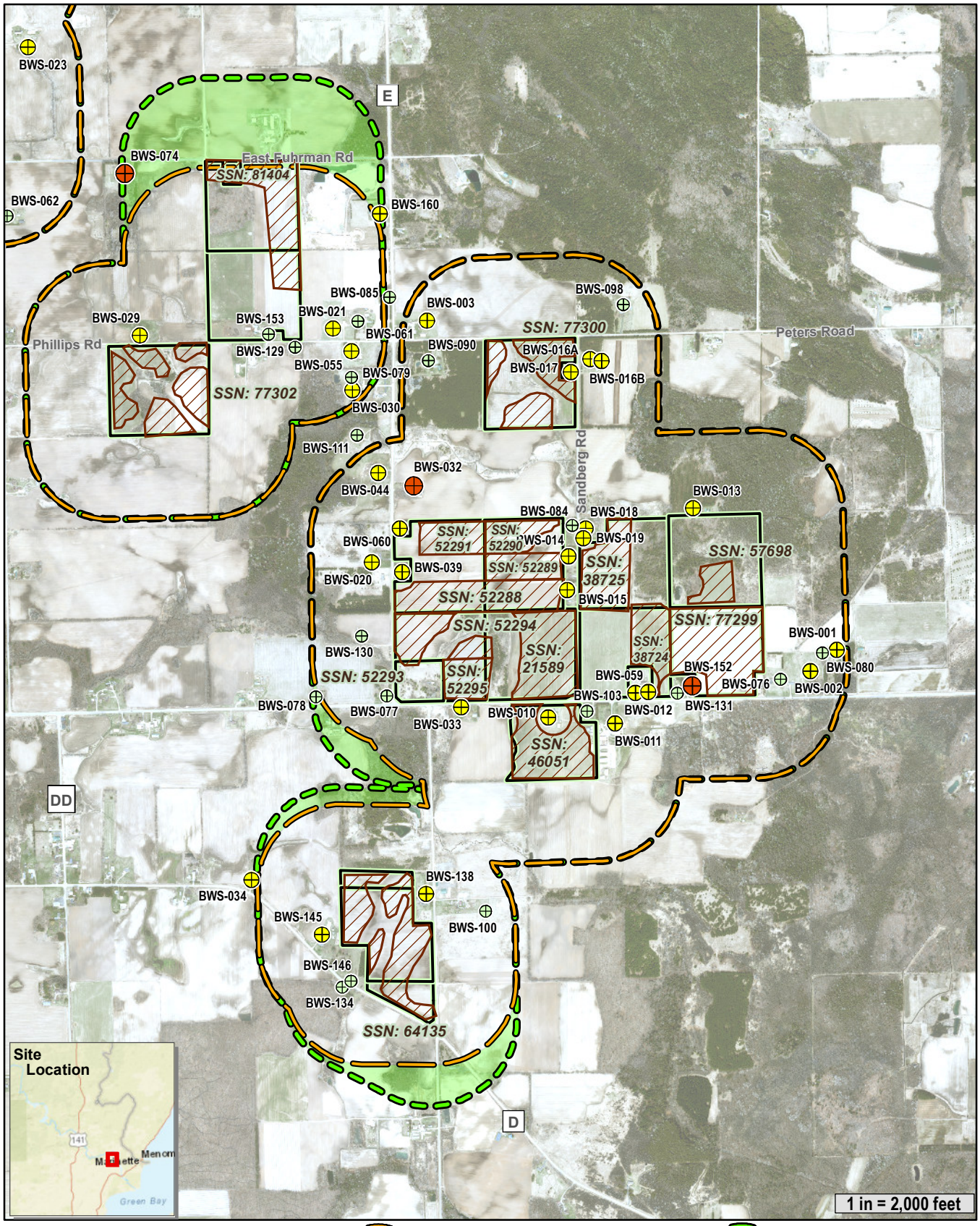

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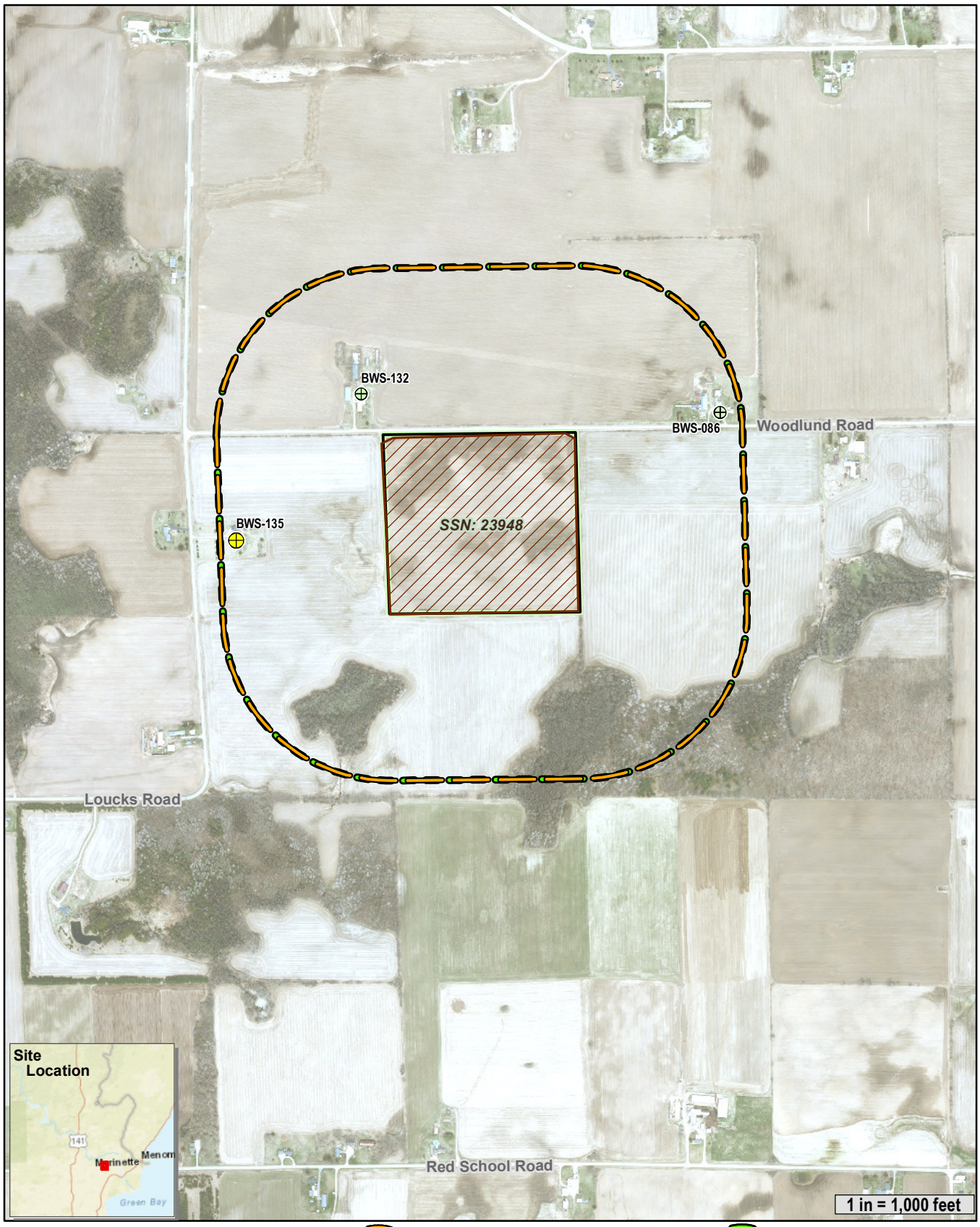

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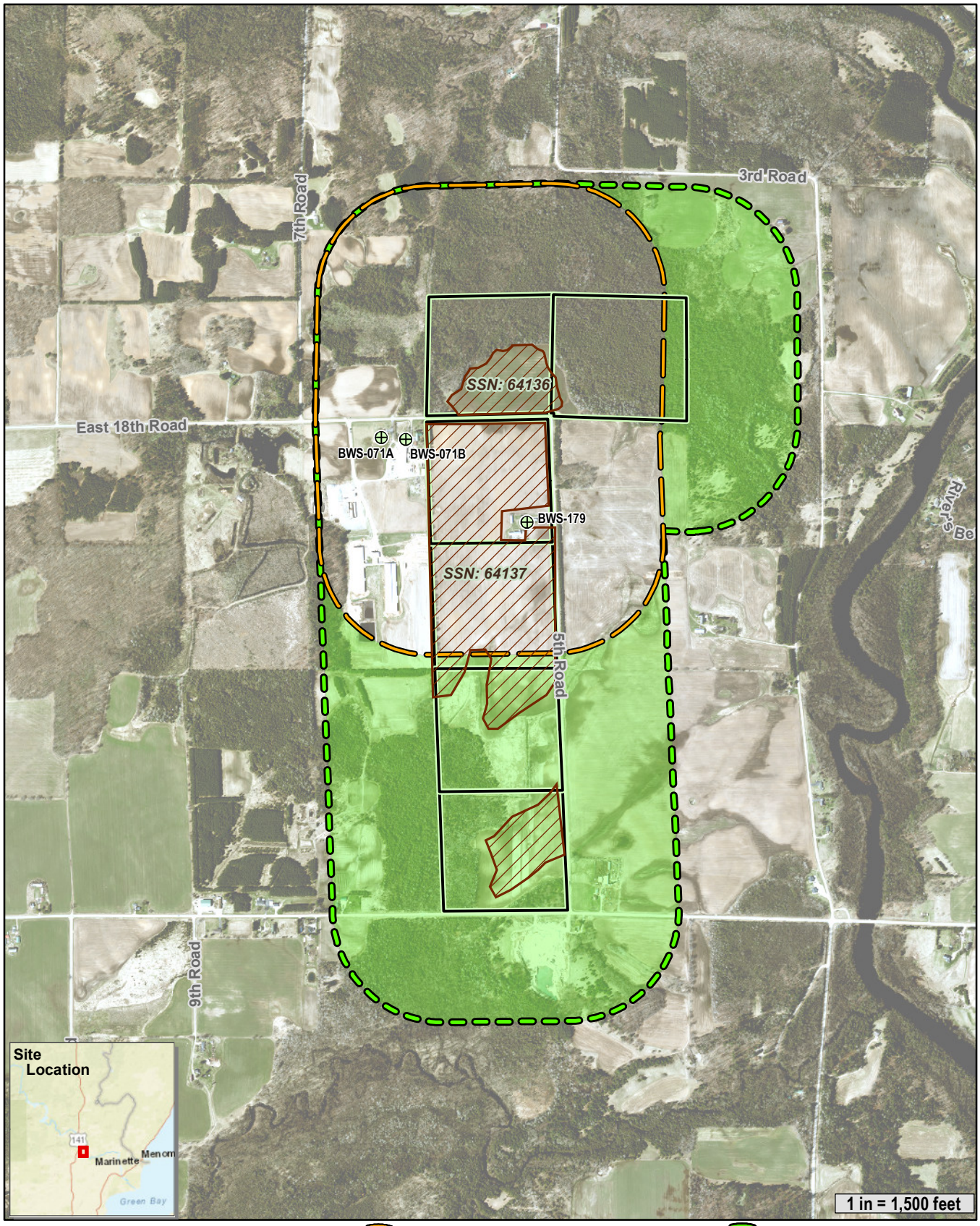

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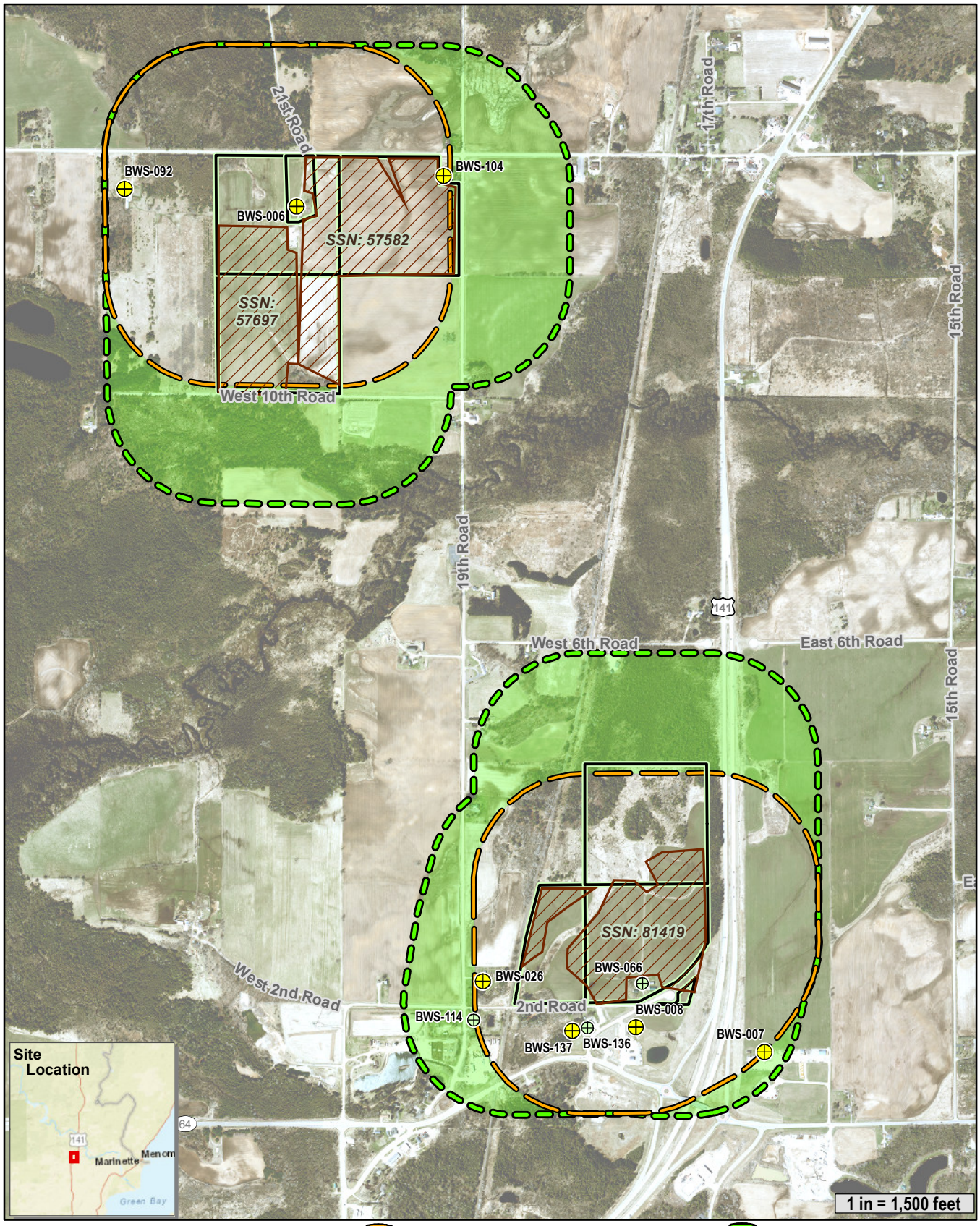

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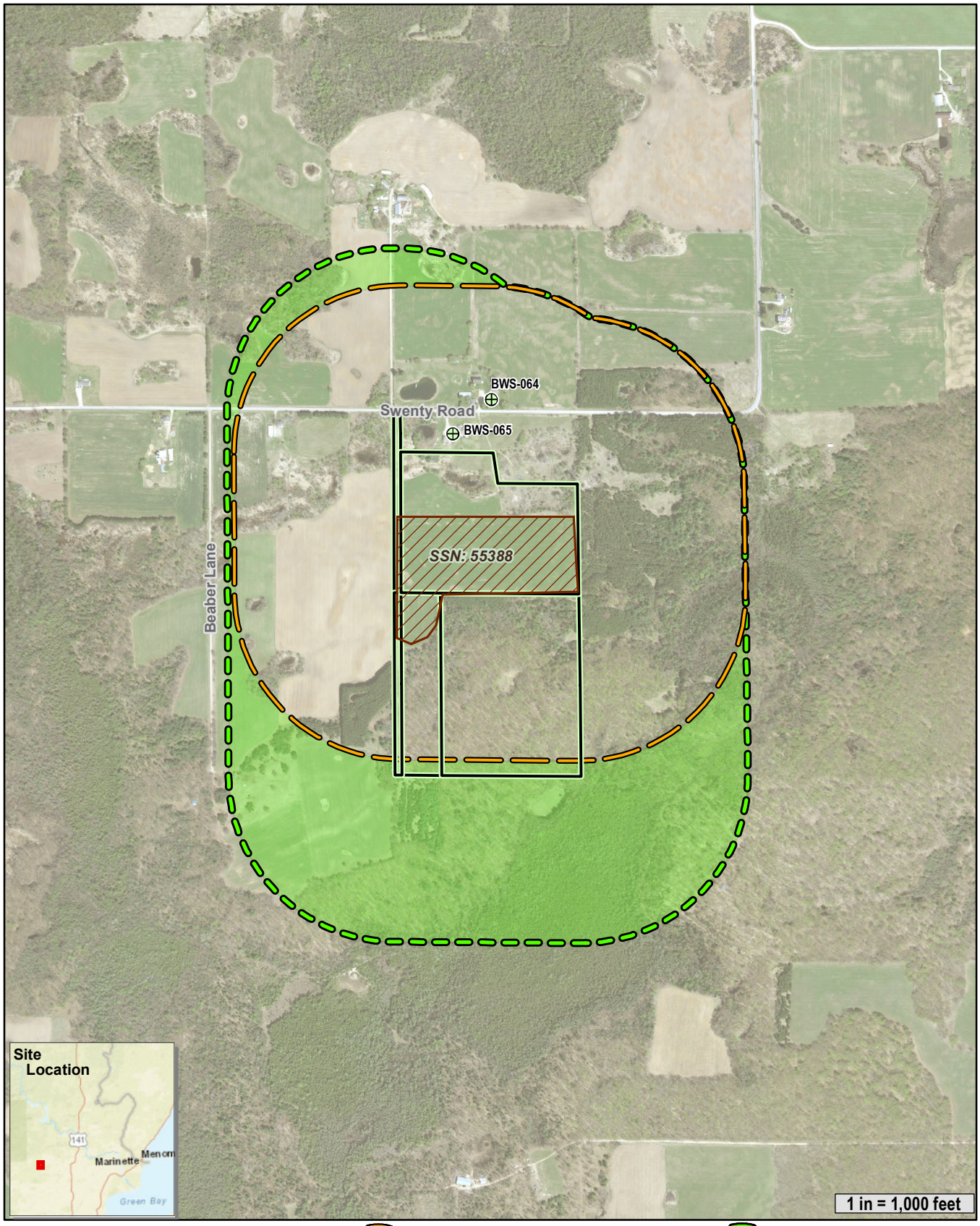

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