



Memorandum

Draft for Review
Privileged and Confidential – Prepared at the Request of Counsel

June 1, 2018

To: Husky Energy Ref. No.: 11156937

From: GHD/dh/131 Tel: 501-224-1926

cc: Dyron Hamlin, MS, PE, CIH; Bradley Free

Subject: Summary of Community Air Monitoring Results: May 31, 2018 – Between 07:00 and 19:00

The purpose of this memorandum is to provide Husky Energy, Inc. (Husky) Site management a summary of the community air monitoring and observations from the air monitoring being performed in Superior, WI and the surrounding area following the fire at the Husky Superior Refinery. This summary memorandum summarizes the air monitoring data collected from May 31, 2018 between 07:00 and 19:00. Community air monitoring was completed during this period in the area around the refinery where residents have returned to their homes following an evacuation order that was in place during and after the refinery fire. Air monitoring activities were conducted in accordance with the Air Monitoring Plan, as amended for a reduction in community teams, developed in consultation with the United States Environmental Protection Agency (USEPA).

Real-time air monitoring was used as a screening tool to indicate the presence or absence of airborne concentrations of Compounds of Interest (COIs) for the purpose of evaluating conditions in the community surrounding the refinery. The results of the air monitoring conducted during this time period in the subject area indicate that COIs, due to Husky activities, were not present above the action levels established in the air monitoring plan.

Air monitoring locations and results are shown on Figure 1 through Figure 4.

Manually Recorded and Continuously Logged Real-time Data

Using calibrated air quality monitoring instruments, GHD monitored for COIs throughout the study area and documented the results by both manually recording data into an electronic database and by using instrument data logging. Data were collected using calibrated monitoring instruments equipped with a photo ionization detector (PID) (10.6 eV lamp) for monitoring volatile organic compounds (VOCs) and electrochemical sensors specific for carbon monoxide (CO), hydrogen sulfide (H₂S), and flammability (LEL). Chemical-specific Dräger sensors were used to detect the presence or absence of Hydrogen Fluoride (HF). TSI DustTrak monitors were used to measure the presence of total airborne particulate matter (dust, smoke, etc.).

The manually recorded data is summarized in Table 1.



Table 1: Manually Recorded Real-Time Data Summary

Monitoring Period 07:00 – 19:00 CDT May 31, 2018

Community Air Monitoring

Parameter	Action Level	Number of Readings Collected	Number of Detectable Readings	Reading Minimum	Reading Average	Reading Maximum	Units
VOC	1	191	0	0.0	0.0	0.0	ppm
H ₂ S	0.51	191	0	0.0	0.0	0.0	ppm
HF	1	191	0	0.0	0.0	0.0	ppm
Particulate	0.100	191	183	0.000	0.015	0.026	mg/m ³

Notes:

VOC – volatile organic compounds

H₂S – hydrogen sulfide

HF – hydrogen fluoride

mg/m³ – milligrams per cubic meter

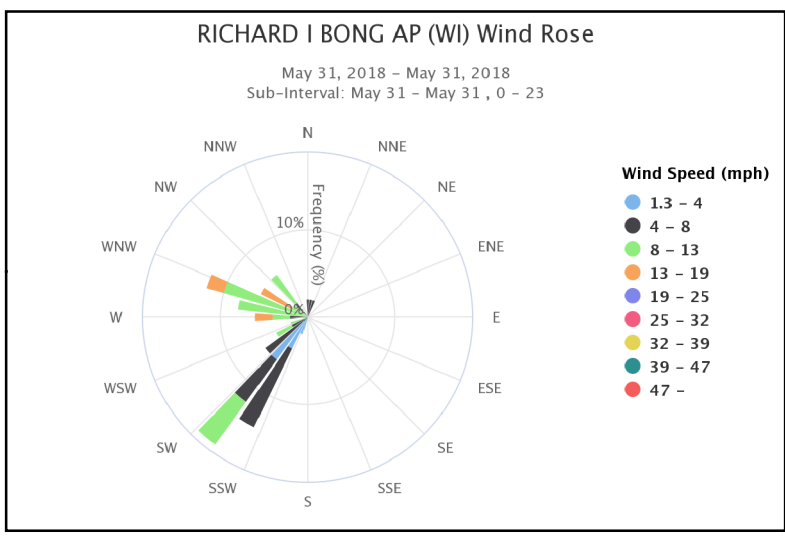
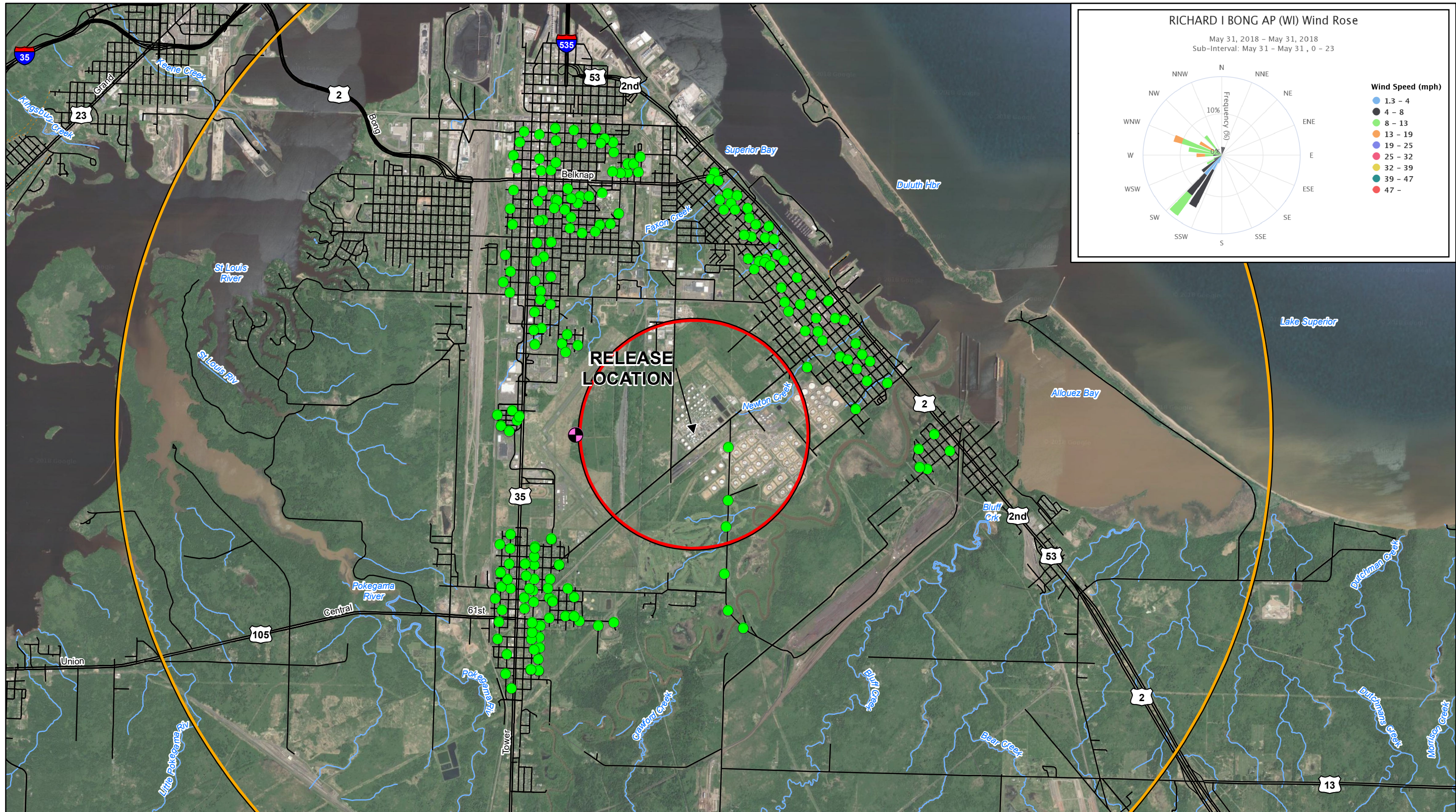
ppm – parts per million

Air Monitoring / Sampling Data Evaluation and Summary of Results

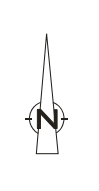
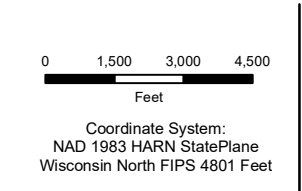
There were no detections above the community action levels for May 31, 2018.

The information contained in this memorandum will be considered preliminary until a final Quality Assurance/Quality Control (QA/QC) review of the data is completed. At the completion of the project, a report will be prepared in which all data collected through real-time monitoring and integrated sampling analyses will be compiled, summarized, and reported to Husky. Data contained in the final report will have been through the final QA/QC process, will be reviewed by a GHD Certified Industrial Hygienist (CIH), and will be considered final.

Based on the air monitoring results for the time period specified, the air quality in the community around the refinery is below relevant action levels established for the Site in discussion with USEPA.



Sources: 2015 TIGER/Line Shapefiles, prepared by the U.S. Census Bureau, 2015; U.S. Geological Survey, National Geospatial Technical Operations Center - National Elevation Dataset, 2015; Imagery © Google.



- Legend**
- 1 Mile Radius
 - 5 Mile Radius
 - Richard I Bong Weather Station

- VOC Reading (ppm)**
- >= 1.0
 - < 1.0
 - Not Measured



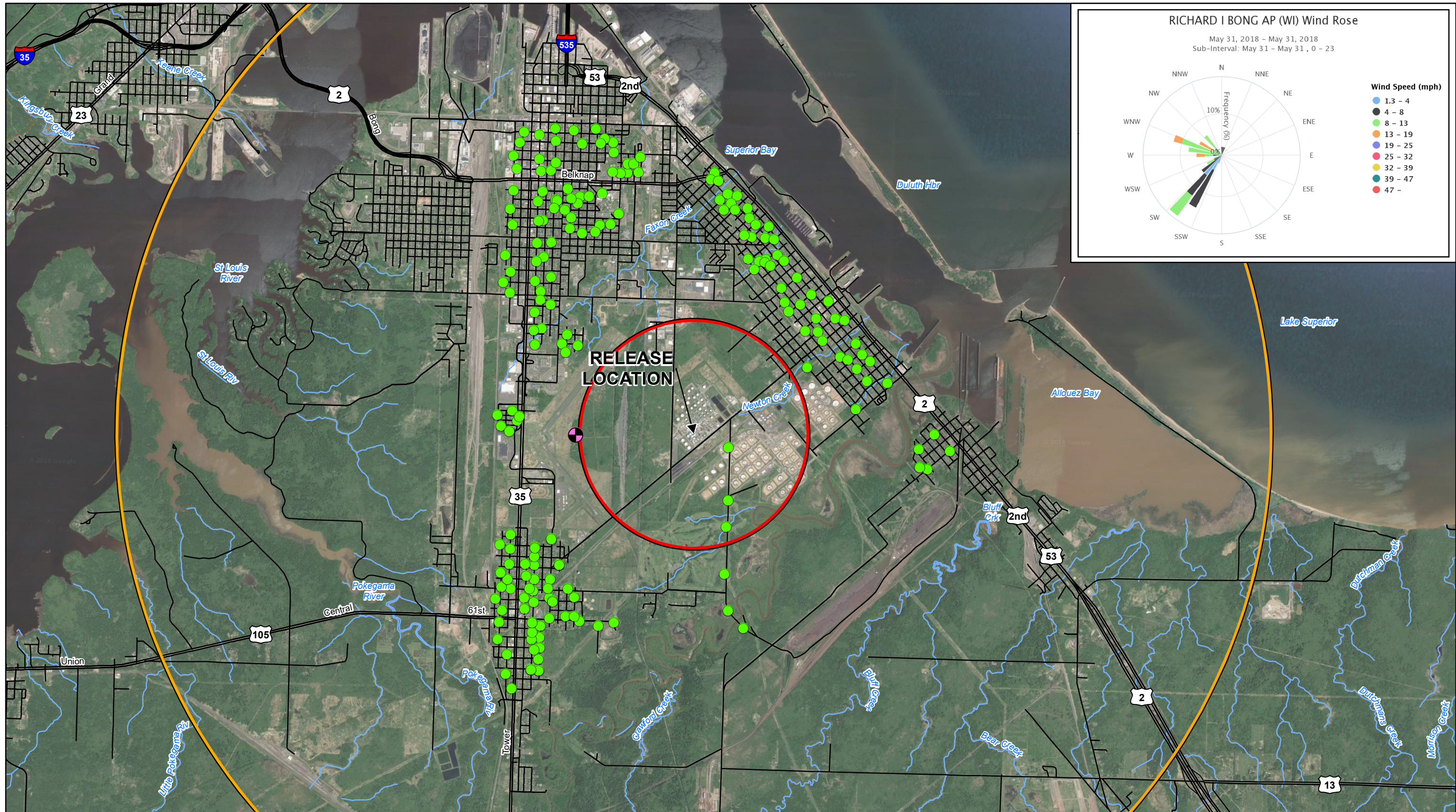
HUSKY ENERGY – SUPERIOR REFINERY FIRE
SUPERIOR, WISCONSIN

COMMUNITY MONITORING - MAY 31, 2018 - 07:00 TO 19:00
MANUALLY LOGGED REAL-TIME RESULTS - VOCs

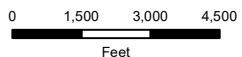
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FIGURE 1



Sources: 2015 TIGER/Line Shapefiles, prepared by the U.S. Census Bureau, 2015; U.S. Geological Survey, National Geospatial Technical Operations Center - National Elevation Dataset, 2015; Imagery © Google.



Coordinate System:
 NAD 1983 HARN StatePlane
 Wisconsin North FIPS 4801 Feet



Legend

- 1 Mile Radius
- 5 Mile Radius
- Richard I Bong Weather Station

H2S Reading (ppm)

- >= 0.1
- < 0.1
- Not Measured



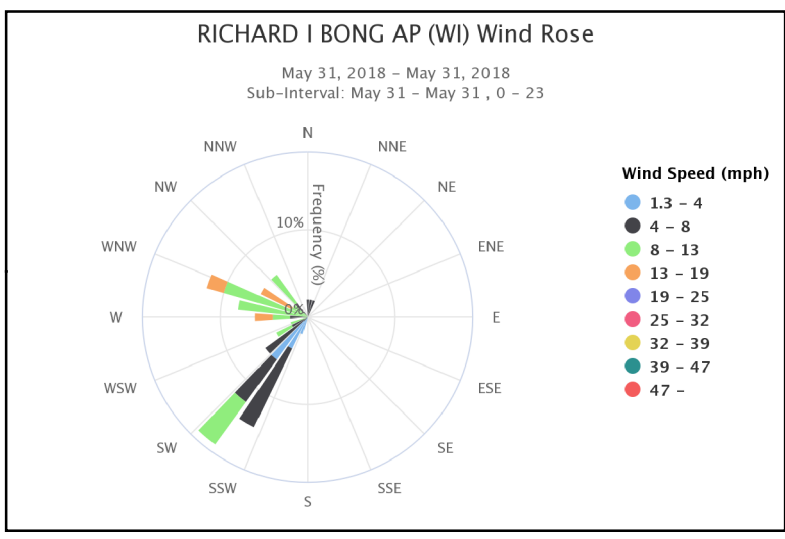
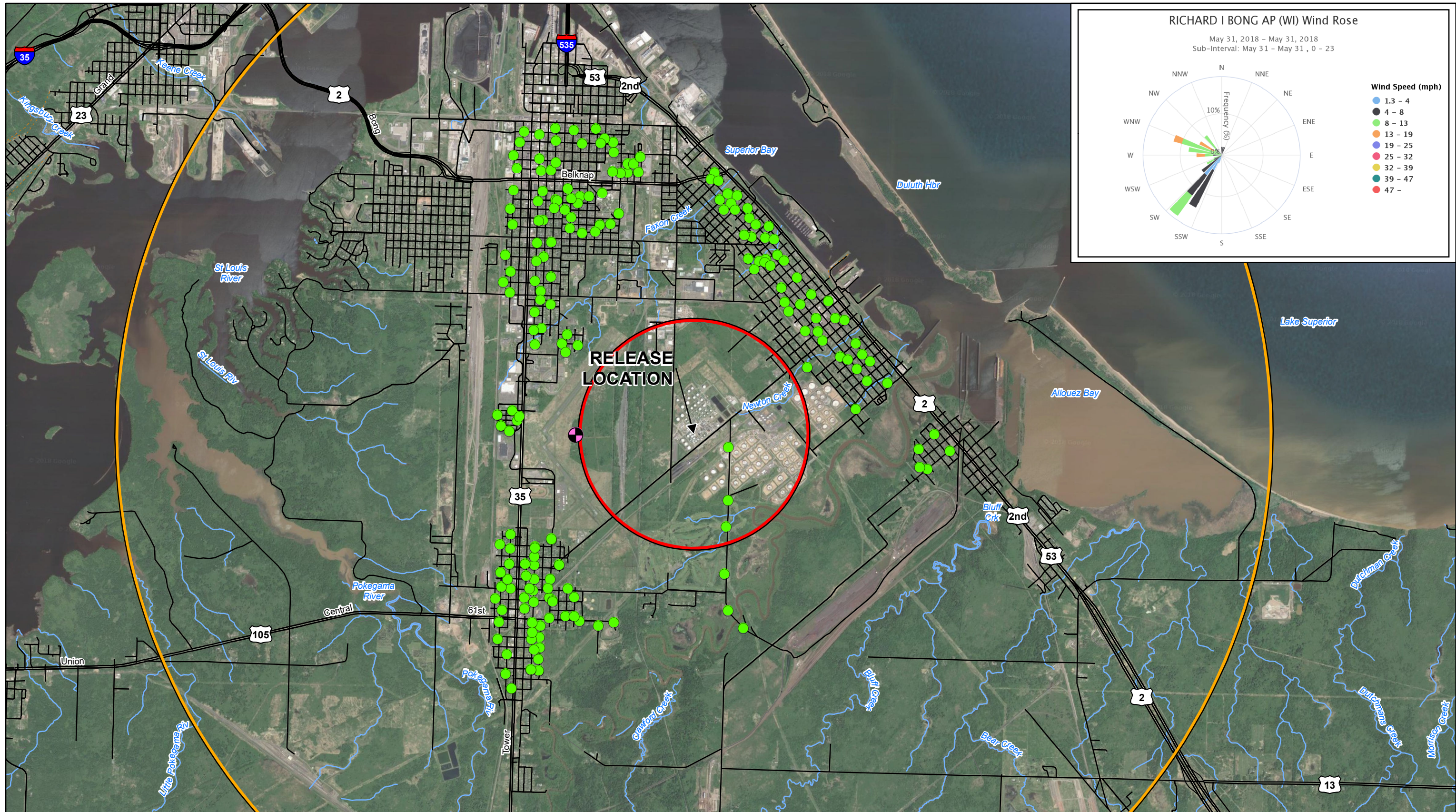
HUSKY ENERGY – SUPERIOR REFINERY FIRE
 SUPERIOR, WISCONSIN

COMMUNITY MONITORING - MAY 31, 2018 - 07:00 TO 19:00
 MANUALLY LOGGED REAL-TIME RESULTS - H2S

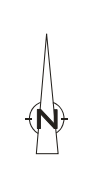
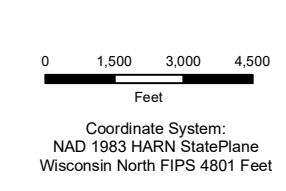
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FIGURE 2



Sources: 2015 TIGER/Line Shapefiles, prepared by the U.S. Census Bureau, 2015; U.S. Geological Survey, National Geospatial Technical Operations Center - National Elevation Dataset, 2015; Imagery © Google.



- Legend**
- 1 Mile Radius
 - 5 Mile Radius
 - Richard I Bong Weather Station

- HF Reading (ppm)**
- >= 1.0
 - < 1.0
 - Not Measured



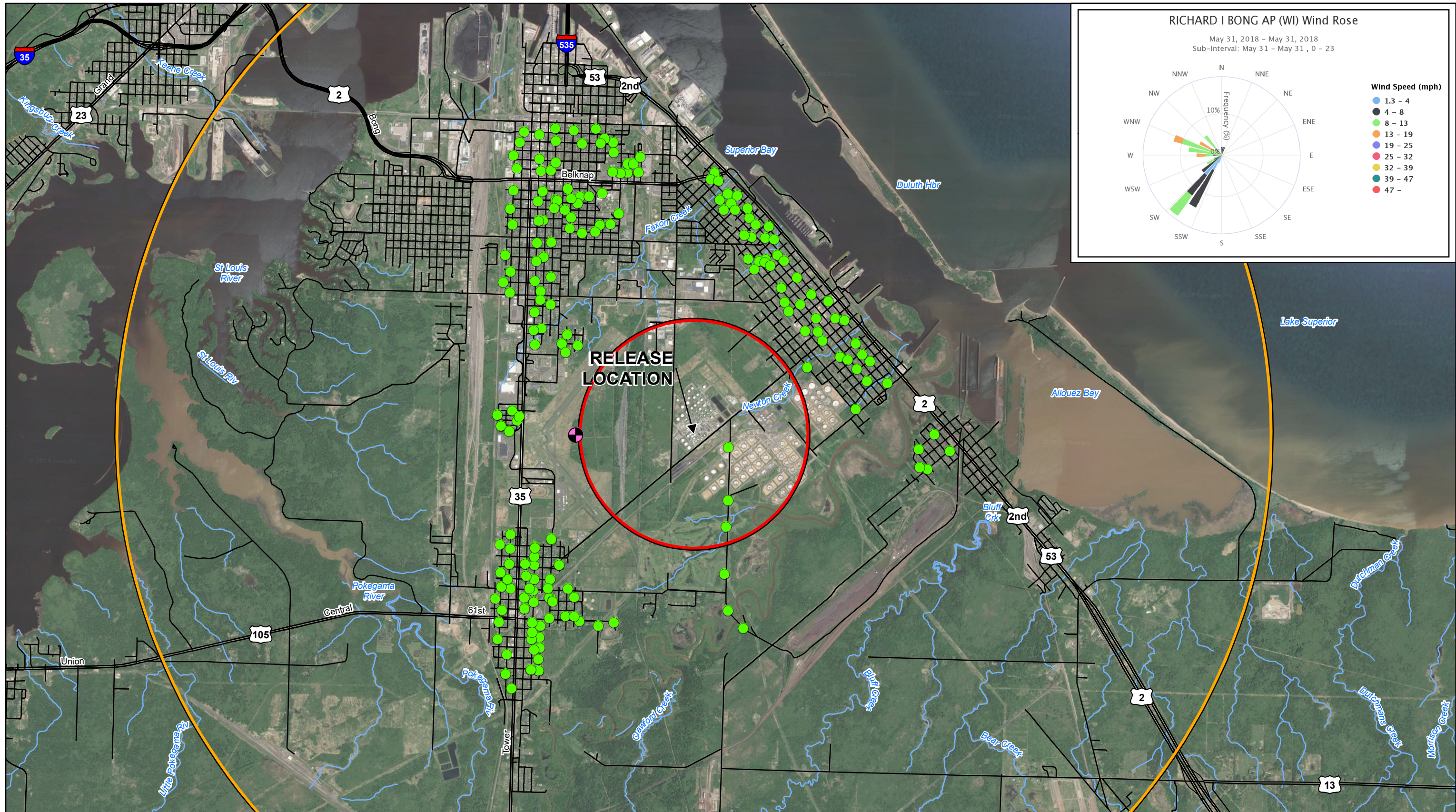
HUSKY ENERGY – SUPERIOR REFINERY FIRE
 SUPERIOR, WISCONSIN

COMMUNITY MONITORING - MAY 31, 2018 - 07:00 TO 19:00
 MANUALLY LOGGED REAL-TIME RESULTS - HF

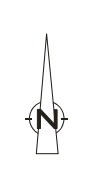
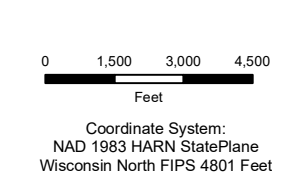
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FIGURE 3



Sources: 2015 TIGER/Line Shapefiles, prepared by the U.S. Census Bureau, 2015; U.S. Geological Survey, National Geospatial Technical Operations Center - National Elevation Dataset, 2015; Imagery © Google.



- Legend**
- 1 Mile Radius
 - 5 Mile Radius
 - Richard I Bong Weather Station

- Particulate Reading (mg/m³)**
- >= 0.1
 - < 0.1
 - Not Measured



HUSKY ENERGY – SUPERIOR REFINERY FIRE
SUPERIOR, WISCONSIN

COMMUNITY MONITORING - MAY 31, 2018 - 07:00 TO 19:00
MANUALLY LOGGED REAL-TIME RESULTS - PARTICULATE

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FIGURE 4