Water Gremlin

HEALTH ASSESSMENT SERIES I 2009-2018 TCE IN AIR MAPS

Maps of estimates of TCE in air from the Water Gremlin facility from 2009-2018, based on MPCA air dispersion modeling data, are now available. The maps were created to provide a better understanding of estimated annual average TCE concentrations over time. The 2018 map is very similar to the map distributed in February 2019. To see the original map and for information about TCE and health, go to the TCE Air Emissions and Health document found at www.health.state.mn.us/communities/environment/hazardous/docs/sites/ramsey/wgtceairemisum.pdf.

What do the maps show?

The maps show the range of estimated annual average amounts of TCE in outdoor air at different locations. These locations were predicted by air quality dispersion modeling to be above the MDH inhalation Health-Based Value (HBV) of 2 µg/m^3 (micrograms per cubic meter). The HBV is an amount, or concentration, of a contaminant in air that is unlikely to lead to health effects even if sensitive members of the population are exposed to it 24 hours a day, 7 days a week, for a lifetime. The highest TCE amounts were predicted to be on the Water Gremlin property. The highest annual average concentration at a residential property was estimated and noted on each map.

What is air quality dispersion modeling?

Air quality dispersion modeling uses computer simulation to predict the amount of a pollutant in air at different locations and distances from a source. MPCA used the AERMOD dispersion model, developed and recommended by the U.S. EPA, to estimate the concentrations of air pollutants emitted from Water Gremlin. AERMOD simulation typically considers the emission rate, stack height, stack diameter, and stack gas temperature and velocity, as well as the effect of nearby buildings and terrain. AERMOD also uses meteorological data such as temperature, wind direction, and wind speed.

Why is the shape of the 2018 map slightly different on earlier versions?

Meteorological data, such as temperature, wind direction, and wind speed, are used in the model to calculate TCE concentrations at various locations. Most meteorological data comes from surface weather observation stations at airports. The meteorological data used to model Water Gremlin emissions earlier this year was from the Minneapolis/St. Paul International Airport. The updated map shows results when meteorological data from the Crystal, MN airport were used. The Crystal airport data are thought to represent conditions near Water Gremlin better. Each map year uses meteorological data from the year of the map, with the exception that the 2017 and 2018 maps use 2016 data, which was the latest meteorological data available at the time the modeling was conducted.

Were TCE air concentrations greater over shorter time periods?

The map underestimates TCE air concentrations for shorter periods of time (e.g., monthly, daily). Because the TCE air estimates are annual averages, it is expected that there were times throughout the year when concentrations at a particular location were higher or lower than the annual average. For example, daily variations are expected due largely to variability in TCE use and weather conditions like wind speed and direction. For periods of time, TCE air concentrations above the HBV extended beyond the outlined area shown in the maps.

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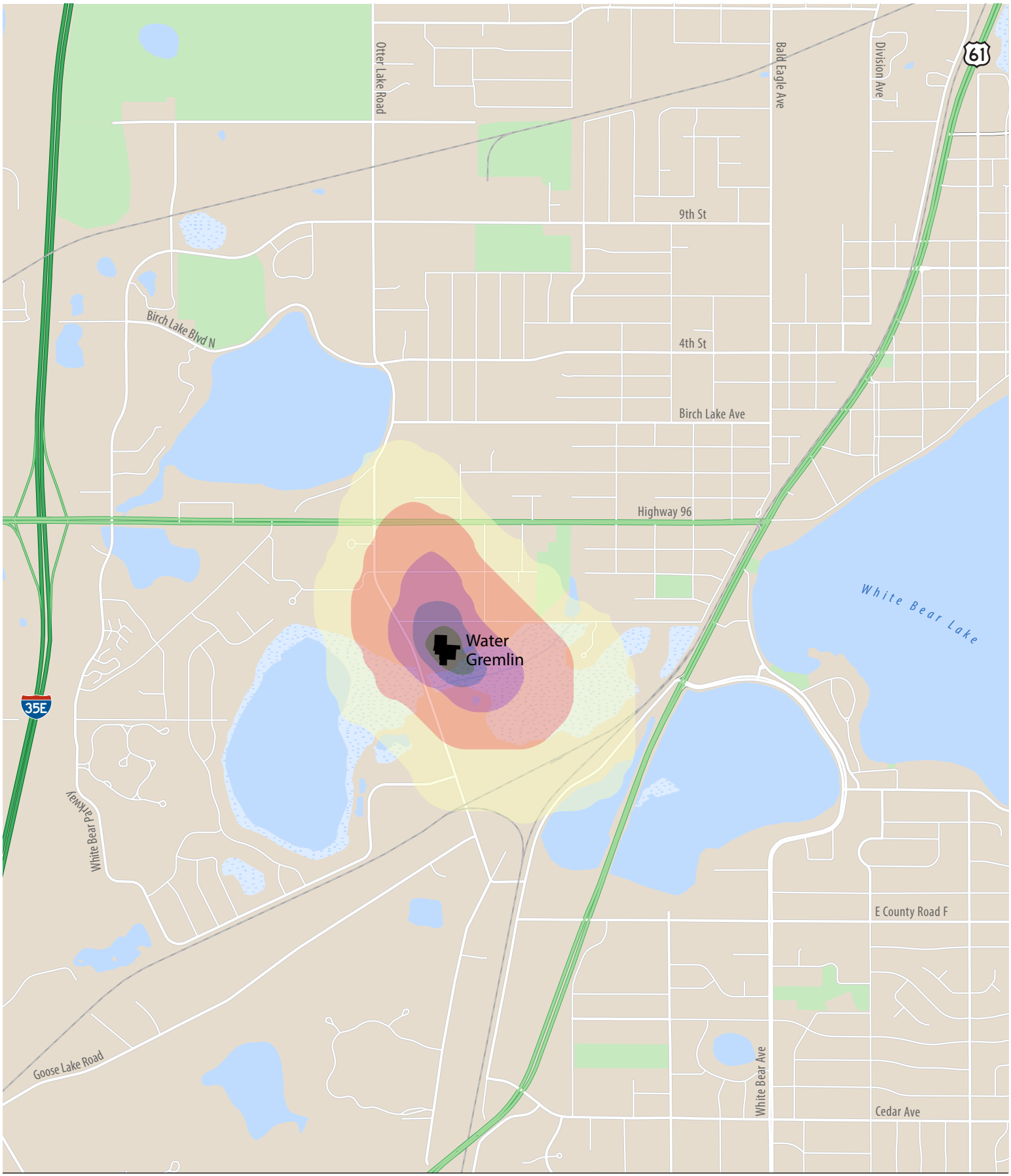
To obtain this information in a different format, call: 651-201-4897
01/07/2020

2009 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 122

Note: The highest annual average amount at a residential property was estimated to be 13 µg/m3

0 Feet 2,000

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Geospatial Research, Analysis, and Services Program GRASP

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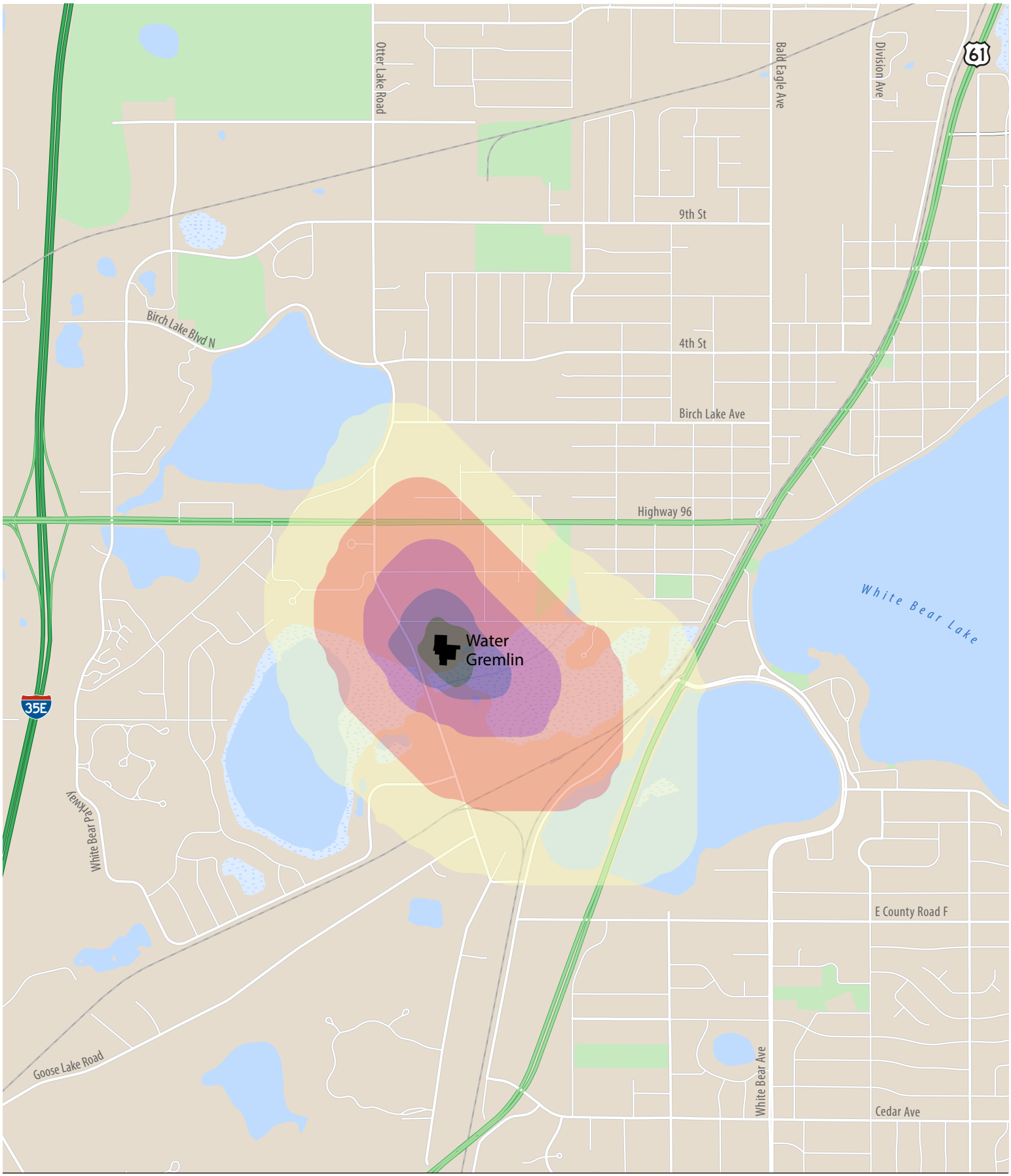
PROJECTION EPSG 26915

DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2010 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 195

Note: The highest annual average amount at a residential property was estimated to be 22 µg/m3

0 Feet 2,000

N

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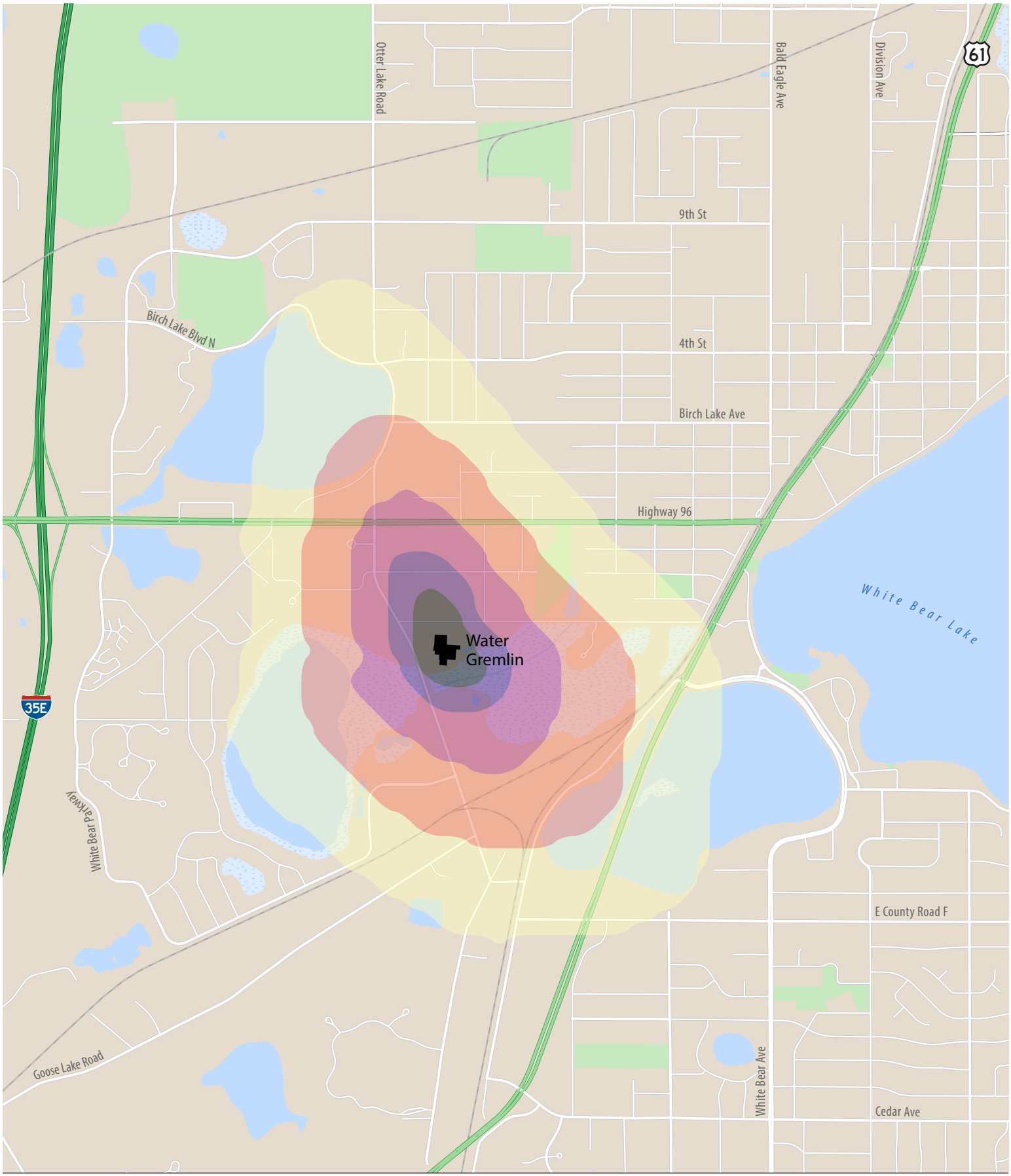
PROJECTION EPSG 26915 **DATE** 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2011 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 265

Note: The highest annual average amount at a residential property was estimated to be 31 µg/m3

0 Feet 2,000

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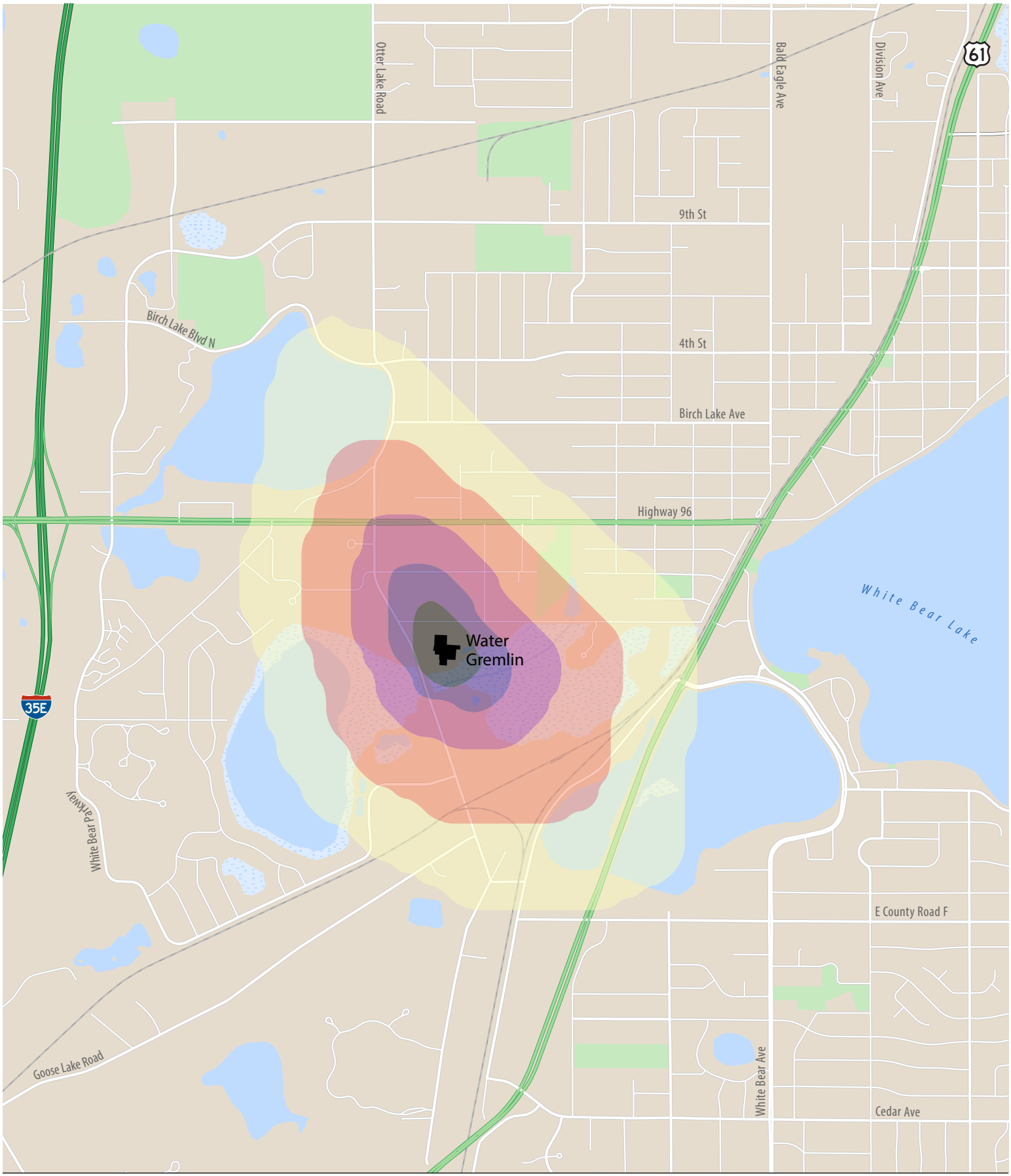
PROJECTION EPSG 26915

DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2012 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 238

Note: The highest annual average amount at a residential property was estimated to be 29 µg/m3

0 Feet 2,000

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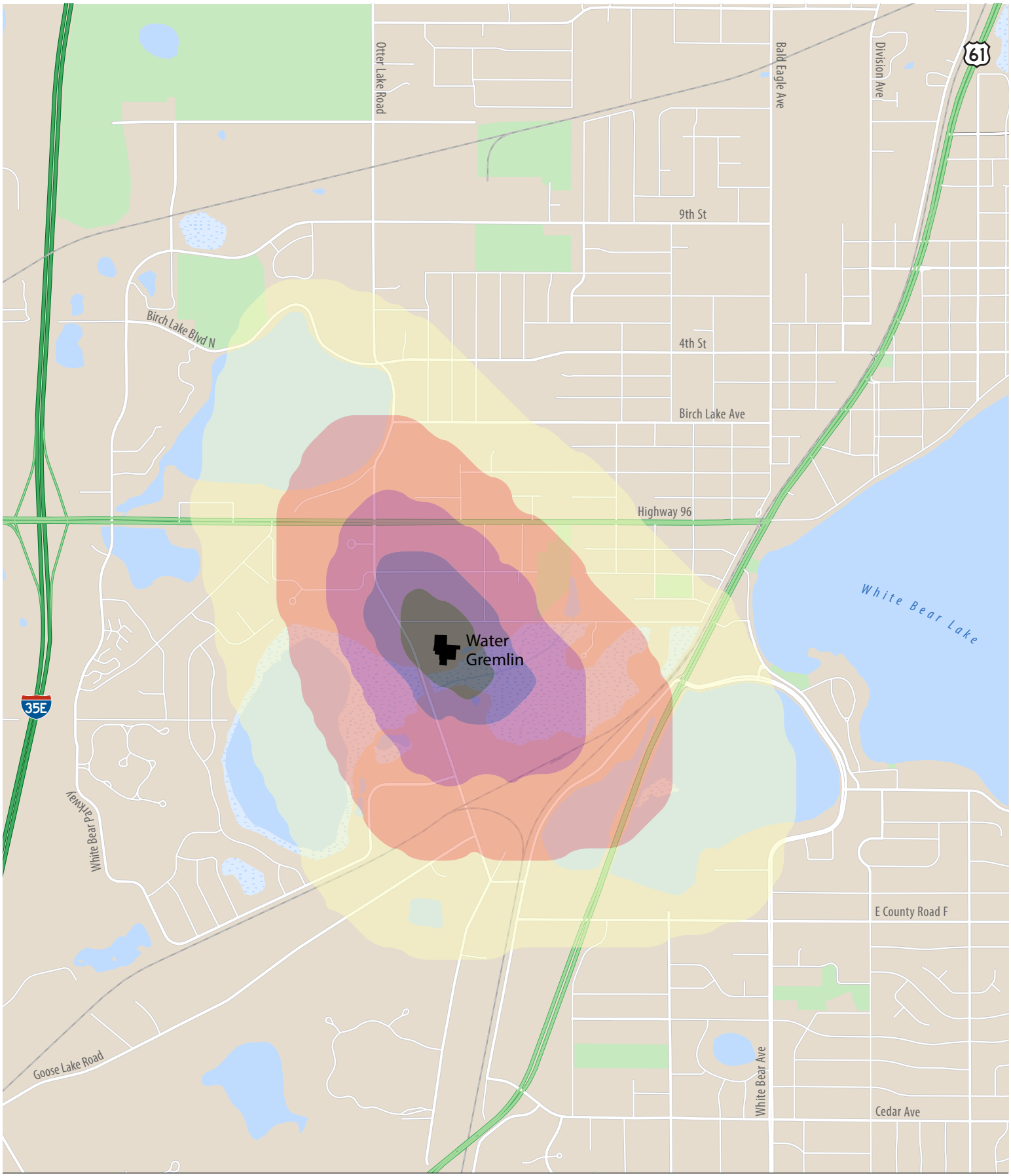
PROJECTION EPSG 26915

DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2013 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 326

Note: The highest annual average amount at a residential property was estimated to be 41 µg/m3

0 Feet 2,000

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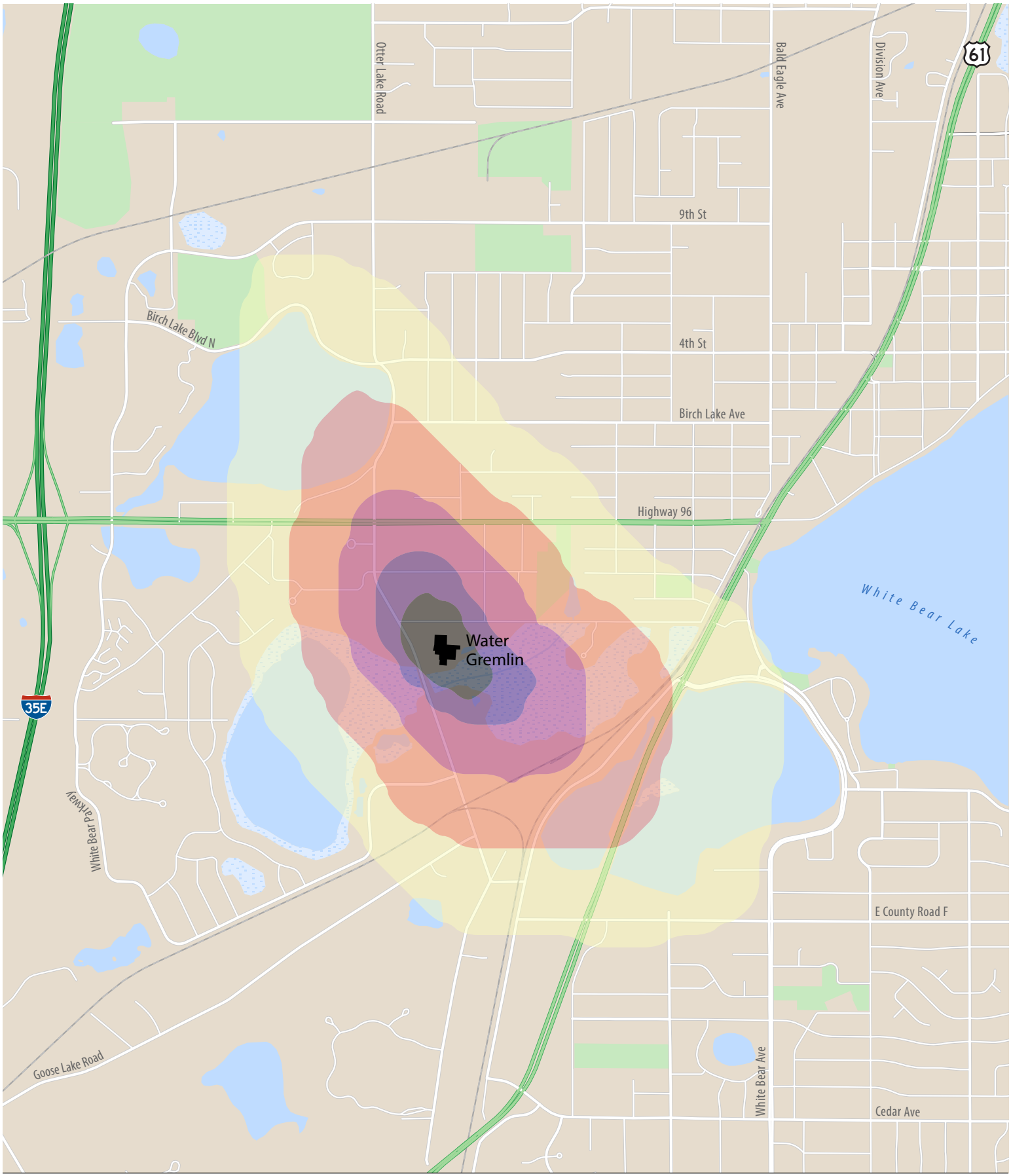
PROJECTION EPSG 26915

DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2014 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 310

Note: The highest annual average amount at a residential property was estimated to be 35 µg/m3

0 Feet 2,000

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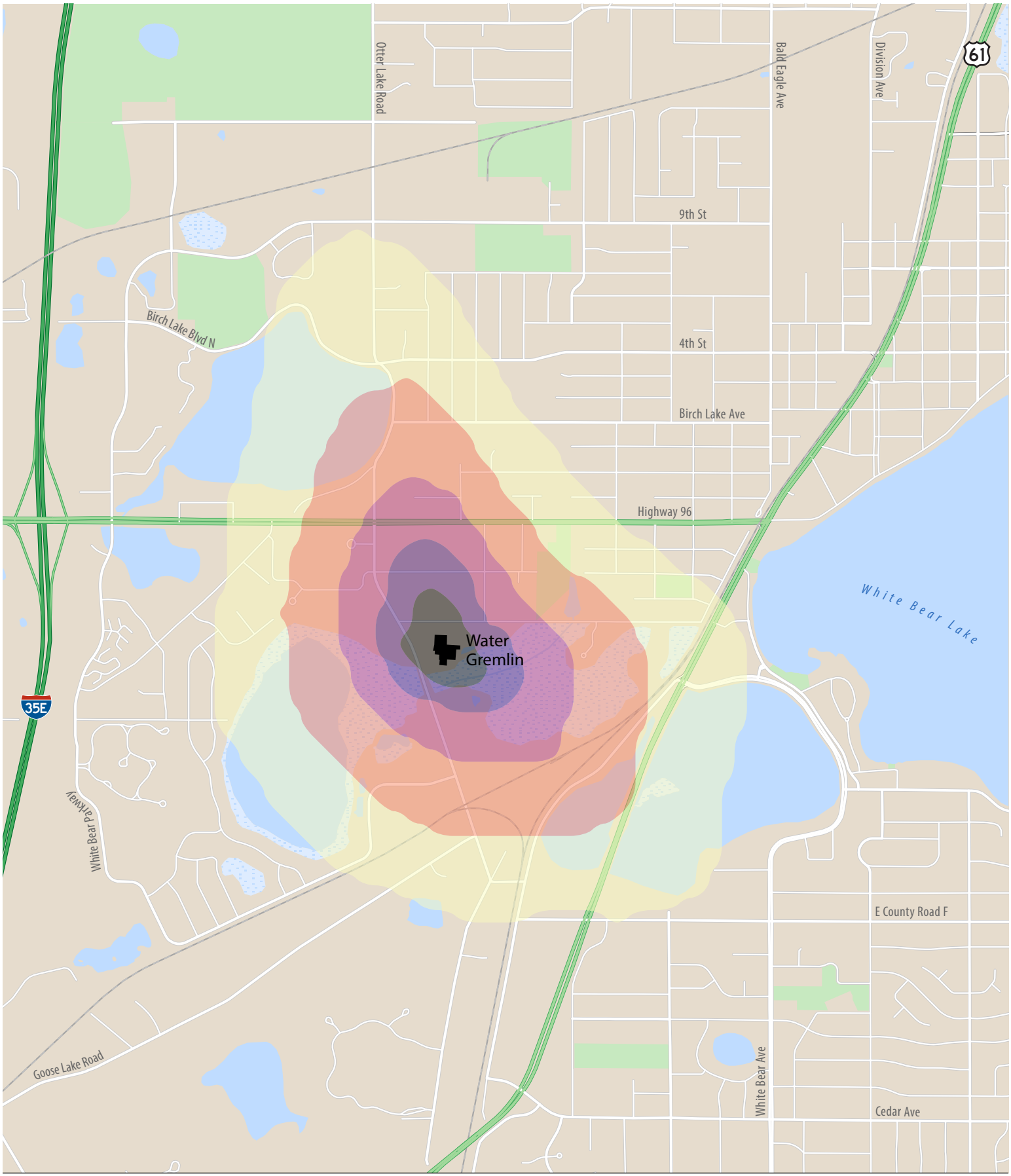
PROJECTION EPSG 26915

DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2015 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 312

Note: The highest annual average amount at a residential property was estimated to be 33 µg/m3

0 Feet 2,000

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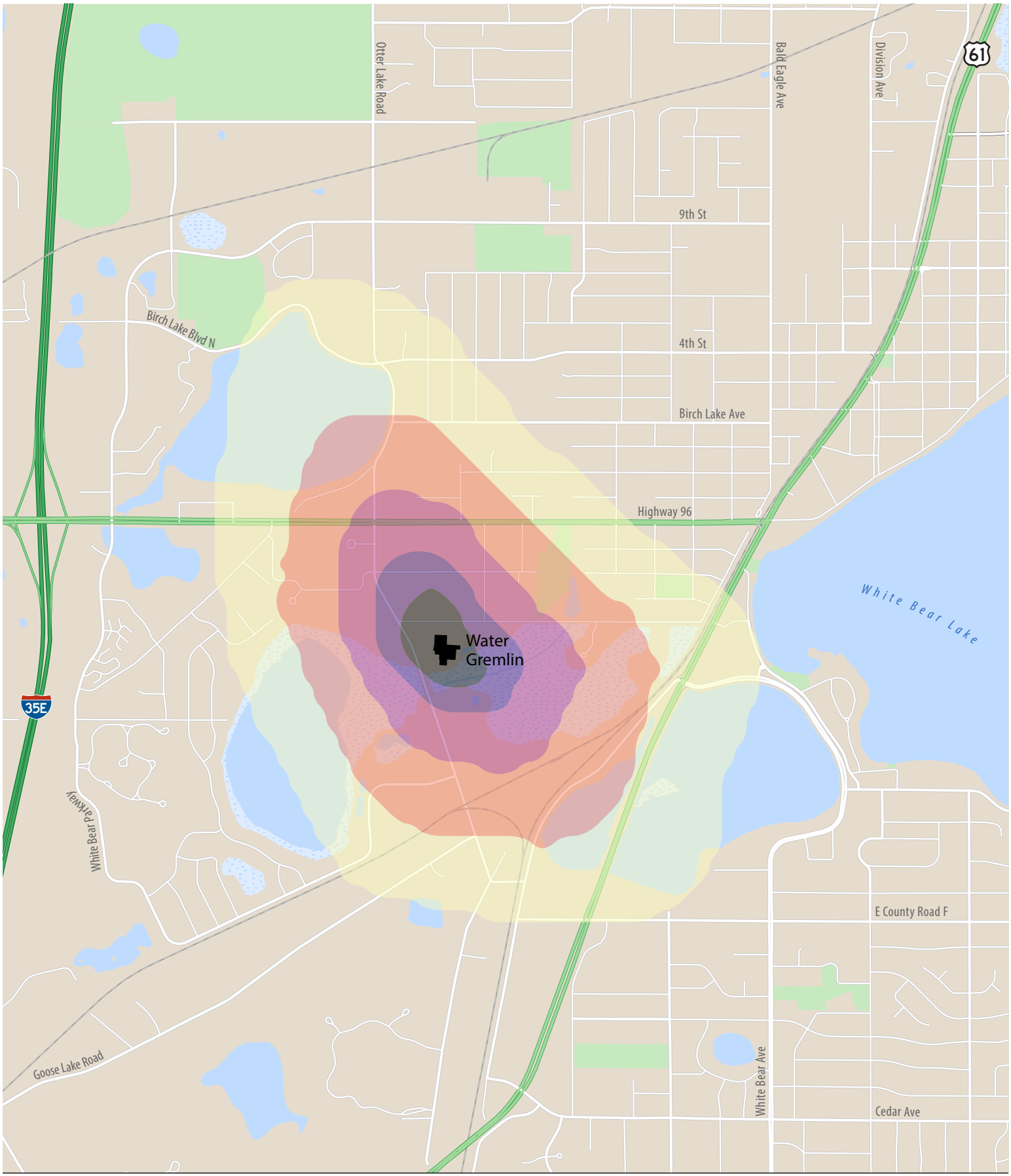
DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2016 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 292

Note: The highest annual average amount at a residential property was estimated to be 38 µg/m3

0 Feet 2,000

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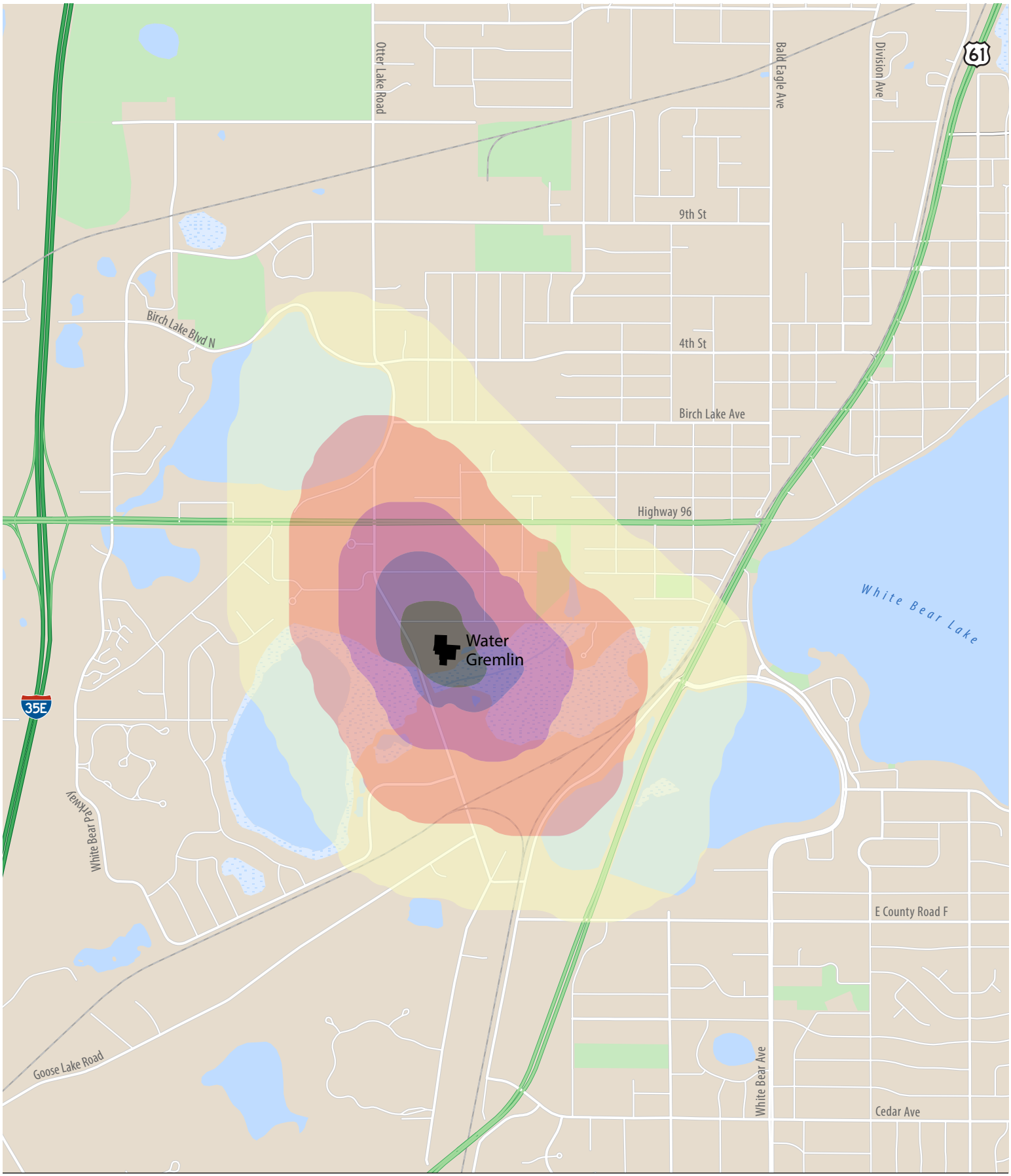
2017 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 278

Note: The highest annual average amount at a residential property was estimated to be 36 µg/m3

0 Feet 2,000

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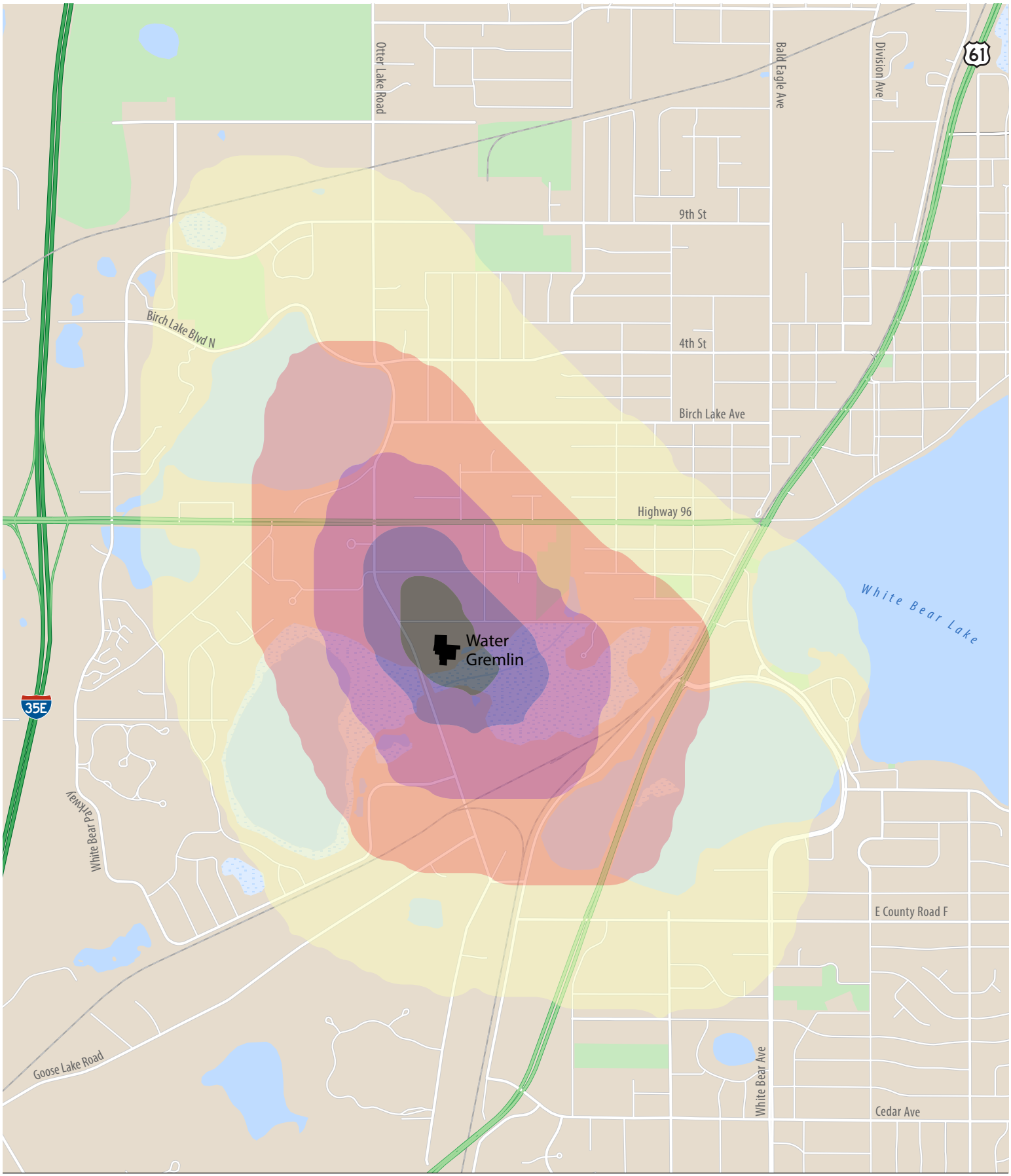
DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett

2018 Estimated Annual Average Amount of TCE in Air from the Water Gremlin Facility



Amount of TCE in air in micrograms per cubic meter (µg/m³) at or above MDH's Health Based Value of 2 µg/m³

2 to 4	4 to 8	8 to 16	16 to 32	32 to 459

Note: The highest annual average amount at a residential property was estimated to be 59 µg/m3

0 Feet 2,000

N

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DATE 2019-12-10 **PRJ ID** 05551 **AUTHOR** W. Hartnett