Final Report
Crowned Ridge Wind Farm
Sound Study
Codington and Grant Counties, SD

Submitted To:
SWCA Environmental Consultants
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501
Tel: 701.258.6622
E-mail: SBaer@swca.com

Submitted By:
Jay Haley, P.E., Partner
EAPC Wind Energy
3100 DeMers Ave.
Grand Forks, ND, 58201
Tel: 701-775-3000
E-mail: jhaley@eapc.net

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Author: Jay Haley

Jay Haley, P.E., Partner

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Report Update

EAPC bears no responsibility to update this report for any changes occurring subsequent to the final issuance of this report.

Revision History

Revision No.	Revision Purpose	Date	Revised By
0	Original	1/22/2019	J. Haley

Executive Summary

EAPC was hired to provide estimates of the potential sound impacts for a proposed wind turbine layout in Codington and Grant Counties of the Crowned Ridge wind farm project in northeastern South Dakota. The scope of this report includes all proposed turbines included in the Crowned Ridge wind farm project that will be permitted separately through the South Dakota Public Utilities Commission. Locations of area existing residences and a wind turbine layout using a mixture of wind turbines manufactured by General Electric (GE) were provided to EAPC by Crowned Ridge Wind, LLC. A computer model was built combining digital elevation data with the information supplied by Crowned Ridge Wind, LLC to generate sound models for the site. The resulting models were then used to perform sound calculations for the 150 turbines. Based on the calculations, site-wide realistic sound maps were produced.

The Crowned Ridge wind farm project was modeled for all counties within the turbine layout and is described in this report as one project. However, for purposes of organization and because of the differences in compliance criteria, the modeling and results of the study are presented individually for each county. The noise ordinances of Codington and Grant Counties are not the same. For Codington County the noise limit is 50 dBA at the property boundary of occupied non-participating landowners. For Grant County the noise limit is 45 dBA at a distance of 25 feet from the perimeter of non-participating occupied structures and 50 dBA at participating occupied structures.

The scope of this study also includes sound impacts that are not regulated by county ordinances including participating and non-participating occupied structures and participating parcel boundaries in Codington County. The turbine array was arranged so that the sound pressure level at all non-participating occupied structures in both counties would be 45 dBA or less and participating occupied structures in both counties would be 50 dBA or less. For all turbines, Low Noise Trailing Edge (LNTE) blades were used to reduce the sound pressure levels in order to achieve compliance with county regulations by increasing the flexibility in turbine locations to meet setback requirements.

The model is based on a number of conservative assumptions. It assumes that the wind turbines are always emitting the maximum sound pressure level with an additional 2 dBA added to the wind turbine noise emission profiles. It is also assumed that each wind turbine is always downwind of each receptor and the atmospheric conditions are most favorable for sound transmission. Also in particular for Grant County, the sound pressure level was calculated at a distance of 50 feet from the perimeter of structures instead of 25 feet. This is also a conservative assumption because the noise levels will be higher at 50 feet than 25 feet.

<u>Crowned Ridge Codington County Turbines</u>
Codington County's current Ordinance #68 Zoning Ordinance Section 5.22.03.12.a notes that the applicable sound limit is 50 dBA at an occupied non-participating property line, which is what has been evaluated in this report for Codington County. Codington County does not have a specific ordinance for sound pressure levels at a participating property boundary;

although not required by the county, the sound pressure levels at participating property boundaries and occupied structures within 2 kilometers of a wind turbine were also evaluated. There is also no ordinance for sound pressure levels at any participating or non-participating occupied structures.

Within the Crowned Ridge Project, for Codington County, an evaluation of the sound impacts at 61 occupied land parcel boundaries (30 participating and 31 non-participating) within Codington County was performed. The 61 (30 participating and 31 non-participating) land parcel boundaries that the existing residences were modeled using an area-type sound sensor so that the highest sound pressure level at the property line could be calculated.

In Codington County, the maximum sound pressure level at a non-participating property boundary is 48.8 dBA, therefore, the project, as modeled, is in compliance with Codington County's allowable sound pressure levels as described in Section 5.03, paragraph 12 of the Codington County Zoning Ordinance #68, which is 50 dBA. The maximum sound pressure level at a participating property boundary is 53.6 dBA.

There are 71 occupied structures (37 participating and 34 non-participating) in Codington County within 2 kilometers of a wind turbine, which were modeled using a point-type sound sensor so that the highest sound pressure level at the perimeter of the structures could be calculated. In Codington County, the maximum sound pressure level at the perimeter of a non-participating occupied structure was 45 dBA. The maximum sound pressure level at a participating occupied structure was 47.9 dBA.

Therefore, the project as modeled, is in compliance with Codington County's allowable sound pressure levels as described in the current Codington County Ordinance.

<u>Crowned Ridge Grant County Turbines</u>
Grant County's current Ordinance 2016-01C, Section 1211.04, paragraph 14 of the current Grant County Zoning Ordinance sets the limit at 45 dBA at a distance of 25 feet from the perimeter of non-participating occupied structures and 50 dBA for participating occupied structures.

For Grant County, an evaluation of the noise impacts at 57 (17 participating and 40 non-participating) occupied structures within 2 kilometers within Grant County was performed. The 57 occupied structures were modeled using a point-type sound sensor so that the highest sound pressure level 25 feet from the perimeter of the structures could be calculated. In Grant County, the maximum sound pressure level 25 feet from the perimeter of a non-participating occupied structure is 43 dBA, and 45.3 dBA for a participating occupied structure.

Based upon the results presented above, the project as modeled, is in compliance with Grant County's allowable sound pressure levels as described in the current Grant County Ordinance.

1. INTRODUCTION

EAPC was hired to conduct sound studies for the regional development of the Crowned Ridge wind farm project located in Codington and Grant Counties in northeastern South Dakota. The regional development's layout consists of 137 GE 2.3 MW wind turbines with a hub height of 90 meters (including 20 alternate turbine locations) and 13 GE 2.3 MW wind turbines with a hub height of 80 meters for a total of 150 wind turbines. The locations of the proposed wind turbines were supplied by Crowned Ridge Wind, LLC.

From the database of existing residences and coordinates supplied by Crowned Ridge Wind, LLC, 71 occupied structures (37 participating and 34 non-participating) in Codington County and 57 occupied structures (17 participating and 40 non-participating) in Grant County were found to be within 2 kilometers of a wind turbine and were included in the sound models. Additionally, 61 occupied land parcels (30 participating and 31 non-participating) were found to be within 2 kilometers of a wind turbine in Codington County, in line with the Codington County ordinance (see below). At a distance of 2 kilometers from a turbine base, the sound pressure level will be less than 35 dBA (considerably less than ordinance limits) so there is no need to include land parcels or structures beyond that distance. Land parcels were not modeled for Grant County as they are not a part of the Grant County ordinance.

The area of interest for this study is located in Codington and Grant Counties near the town of Watertown in northeastern South Dakota. The surrounding terrain has a change in elevation across the project site ranging from 475 to 621 meters (1,558 to 2,037 feet) at the wind turbine base. The region's vegetation is comprised primarily of prairie grass and agricultural land. The project overview map can be found in Appendix A.

2. BACKGROUND AND COUNTY REGULATIONS

To determine if the layout provided would be compliant for the Crowned Ridge Project and in line with each county's regulations, detailed sound scenarios were analyzed using a computer model. The scenarios assumed that the wind turbines were operating at a wind speed that resulted in the loudest sound being emitted, which is conservative because the turbines would not actually be operating at maximum sound output levels at all times.

Codington County's current Ordinance #68 Zoning Ordinance Section 5.22.03, paragraph 12.a) prescribes sound limits for wind turbine projects as follows:

"12.a) Noise level generated by wind energy system shall not exceed 50 dBA, average A-weighted sound pressure including constructive interference level effects at the property line of existing off-site non participating residences, businesses, and buildings owned and/or maintained by a governmental entity."

Therefore, Codington County's only applicable sound limit is 50 dBA at an occupied non-participating property line, which is what has been evaluated in this report for Codington County. Although not required by the county, the sound pressure levels at participating property boundaries and participating and non-participating occupied structures (i.e., residences, business, and buildings) within 2 kilometers of a wind turbine were also evaluated.

Grant County's current Ordinance 2016-01C, Section 1211.04, paragraph 14 prescribes sound limits for wind turbine projects as follows:

"14.) Noise. Noise level shall not exceed 45 dBA, average A-weighted Sound pressure including constructive interference effects measured twenty-five (25) feet from the perimeter of existing off-site non-participating residences, businesses, buildings owned and/or maintained by a governmental entity."

"Noise level shall not exceed 50 dBA, average A-weighted Sound pressure including constructive interference effects measured twenty-five (25) feet from the perimeter of participating residences, businesses, and buildings owned and/or maintained by a governmental entity."

Therefore, Grant County's current applicable sound limit is 45 dBA for all non-participating, and 50 dBA for all participating, existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity. For purposes of this report, these residences, businesses, and buildings will hereafter be referred to as occupied structures.

3. *STUDY METHODOLOGY*

This sound analysis was performed utilizing windPRO[1], which has the ability to calculate detailed sound maps across an entire area of interest or at site-specific locations using sound sensitive receptors.

The analysis used the ISO 9613-2 "Attenuation of sound during propagation outdoors, Part 2" sound calculation model with "General" ground attenuation and an attenuation factor of 0.5, which represents typical mixed vegetation (i.e., prairie grass, weeds, brush) and crop cover. Realistic sound pressure levels were calculated at 1.5 m AGL at the participating and non-participating existing occupied structures and occupied parcel boundaries (Codington County only). The term "realistic" in this case, means that some amount of ground attenuation is accounted for.

The inputs and assumptions for the windPRO sound calculation include the following:

[1] windPRO is the world's leading software tool for designing wind farms, including sound analysis.

- Turbine Coordinates
- Turbine Specifications
- Turbine Sound Emission Data
- Sound Receptor Coordinates
- Participation Status
- USGS Digital Elevation Model (DEM) (height contour data)
- Uncertainty Factor
- Meteorological Conditions
- Ground Attenuation

Turbine Coordinates: The location of a wind turbine in relation to a sound receptor is one of the most important factors in determining sound impacts. Sound pressure levels drop as they travel farther from the source of emission. The attenuation comes from atmospheric absorption as well as from absorption by the ground cover between the turbine and the receptor. The sound pressure waves can also be reflected by hard or smooth surfaces such as ice or water. Sound is also absorbed by trees and reflected by structures such as buildings or walls, although these effects (trees and buildings) are ignored in the model.

Turbine Specifications: GE Wind turbine specifications from the manufacturer were supplied to EAPC by Crowned Ridge Wind, LLC. Wind turbine specifications included in the model were the power curves, blade types (standard and low noise), hub heights and operational rotational speed of the rotor. For all turbines, Low Noise Trailing Edge (LNTE) blades were used to reduce the sound pressure levels in order to achieve compliance with county regulations by increasing the flexibility in turbine locations to meet setback requirements.

Turbine Sound Emission Data: Sound emission data including 1/3rd octave data supplied by the manufacture is used assuming the loudest sound pressure levels are being emitted at the hub height of the turbine. A safety margin of 2 dBA was added to the wind turbine noise emission profiles for the analysis in order to produce more conservative results, meaning that the model will predict higher sound pressure levels.

According to the GE sound documentation provided to EAPC by Crowned Ridge Wind, LLC, the loudest normal operating sound pressure level emitted from the GE 2.3-116, the loudest normal operating sound pressure level emitted is 107.5 at 10 m/s and higher at hub height. Since the value is reported at hub height, it is the same value for both 80 meter and 90 meter hub-height turbines.

The specifications for the GE wind turbine models used in this study are included in Table 1 below. The table of wind turbine coordinates is included in Appendix B.

Table 1: Crowned Ridge wind energy project wind turbine specifications.

Crowned Ridge wind energy project wind turbine specifications							
Manufacturer	Model	Hub Height (m)	Rotor Dia. (m)	Cut-In Wind Speed (m/s)	Cut-Out Wind Speed (m/s)	Max. Sound Press. Level (dBA)	Max. Sound Press. Level LNTE (dBA)
General Electric	GE 2.3	80	116	3	22	107.5	106
General Electric	GE 2.3	90	116	3	22	107.5	106

Sound Receptor Coordinates: As with the wind turbine coordinates, the elevation, and distance of a sound receptor in relation to the wind turbines are the main factors in determining the sound impacts. EAPC was provided with coordinates for all existing residences, and occupied structures found to be located within 2 kilometer of the 150 proposed wind turbine locations by Crowned Ridge.

In Grant County, where the point of compliance is 25 feet from the perimeter of the structure, a ring of receptors was modeled 50 feet from the perimeter in order to capture sound levels that would conservatively represent the sound pressure levels 25 feet away from the perimeter.

Receptor Participation Status: A database indicating the participation status of the land parcels and the structures within the wind farm boundary were supplied to EAPC by Crowned Ridge Wind, LLC.

USGS Digital Elevation Model (DEM) (height contour data): For this study, 3 m resolution USGS National Elevation Database (NED) DEM's were used to construct 10-foot interval height contour lines for the windPRO sound model. The height contour information is important to the sound calculation since it allows the model to place the wind turbines and the sound receptors at the correct elevations.

Uncertainty Factor: No uncertainty factor was provided by the wind turbine manufacturer. In this situation, it is common practice based on experience and studies to add 2 dBA to the sound pressure levels of each wind turbine. For this analysis, the 2 dBA were added to all wind turbine noise emission profiles.

Meteorological Conditions: A temperature of 10^{o} C (50^{o} F) and a relative humidity of 70% were assumed for the analysis. These conditions represent an atmospheric "worst case" scenario where sound waves will travel farther with less atmospheric absorption. This will lead to more conservative (higher predicted sound levels) results.

All wind turbines are assumed to be operating simultaneously at maximum sound output levels. All turbines are assumed to be downwind of all receptors, which is another conservative (higher predicted sound pressure levels) assumption.

Ground Attenuation: A ground attenuation factor of 0.5 was assumed for this analysis. It represents "mixed ground" consisting of half hard and half soft (porous) ground cover, which is slightly conservative and will result in higher predicted sound levels since the ground cover includes native prairie and agricultural crop land.

No other sources of sound attenuation such as trees, air turbulence or wind shadow effects were assumed in the analysis.

Wind Turbines from Adjacent Projects: The Crowned Ridge II project is adjacent to the Crowned Ridge project. Because sound impacts are cumulative, there will be impacts from the Crowned Ridge II project that will be additive to the impacts from the Crowned Ridge project. The Crowned Ridge II wind turbine array was included in the model to capture the full sound impacts on the receptors, which are included in the current Crowned Ridge tabular results; however, the sound iso-line maps only show the sound emissions from the Crowned Ridge array.

4. *RESULTS OF ANALYSIS*

Although modeled as one project, the noise ordinances of the two counties are not the same. For Codington County, the noise limit is 50 dBA at the property boundary of occupied non-participating landowners. Codington County does not have a specific ordinance for sound pressure levels at a participating property boundary; although not required by the county, the sound pressure levels at participating property boundaries and occupied structures within 2 kilometers of a wind turbine were also evaluated. There is also no ordinance for sound pressure levels at any participating or non-participating occupied structures. For Grant County, the noise limit is 45 dBA at a distance of 25 feet from the perimeter of non-participating occupied structures and 50 dBA at participating occupied structures. Because of the differences in compliance criteria, the results of the study are presented individually for each county.

<u>Crowned Ridge Codington County Turbines</u>

For the Crowned Ridge Codington County Turbines, the sound study indicates that the highest sound pressure level at a non-participating property boundary is 48.8 dBA. Therefore, the project would be in compliance with Codington County's allowable sound pressure levels as described in Section 5.22.03 paragraph 12 of Ordinance #68. Table 2 shows the distribution of sound pressure levels for the project. The maximum sound pressure level at a participating property boundary is 53.6 dBA; however, as there is no county ordinance for participating property boundaries. This information is provided for transparency.

Table 2: Codington County property boundary realistic sound distribution

Realistic Sound (dBA)	Non-Participating Property Boundary	Participating Property Boundary
0 to 25	0	0
25 to 30	0	0
30 to 35	0	0
35 to 40	9	2
40 to 45	10	2
45 to 50	11	11
50+	0	16

Crowned Ridge Grant County Turbines

For Grant County, the sound study indicates that the highest sound pressure level at a distance of 25 feet from the perimeter of a non-participating occupied structure is 43 dBA. The highest sound pressure level at a distance of 25 feet from the perimeter of a participating occupied structure is 45.3 dBA. Therefore the project would be in compliance with Grant County's allowable sound pressure levels as described in Section 1211.04, paragraph 14 of the current Grant County Zoning Ordinance 2016-01C. Table 3 shows the distribution of sound pressure levels for the project.

Table 3: Grant County occupied structure realistic sound distribution

Realistic Sound (dBA)	Non-Participating Occupied Structures	Participating Occupied Structures
0 to 25	0	0
25 to 30	0	0
30 to 35	5	0
35 to 40	17	5
40 to 45	18	9
45 to 50	0	3
+50	0	0

Crowned Ridge Project Summary

The summary results for the Crowned Ridge Project are shown in table 4 below. The full table of results from the sound study can be found in Appendix C. Table C-1 lists the results sorted by receptor number and Table C-2 lists the results sorted by sound impacts

(dBA) from highest to lowest. The tabular results include the cumulative impacts from Crowned Ridge and Crowned Ridge II windfarms. The maps showing the sound impact iso-lines for the Crowned Ridge wind farm are in Appendix D.

Table 4: Summary of sound pressure level predictions.

County	Feature	Noise Limit (dBA)	Maximum Predicted (dBA)
Codington	Participating Occupied Structures	N/A	47.9
	Non-Participating Occupied Structures	N/A	45
	Participating Occupied Parcel Boundary Lines	N/A	53.6
	Non-participating Occupied Parcel Boundary Lines	50	48.8
Grant	Participating Occupied Structures	50	45.3
	Non-Participating Occupied Structures	45	43

5. *CONCLUSIONS*

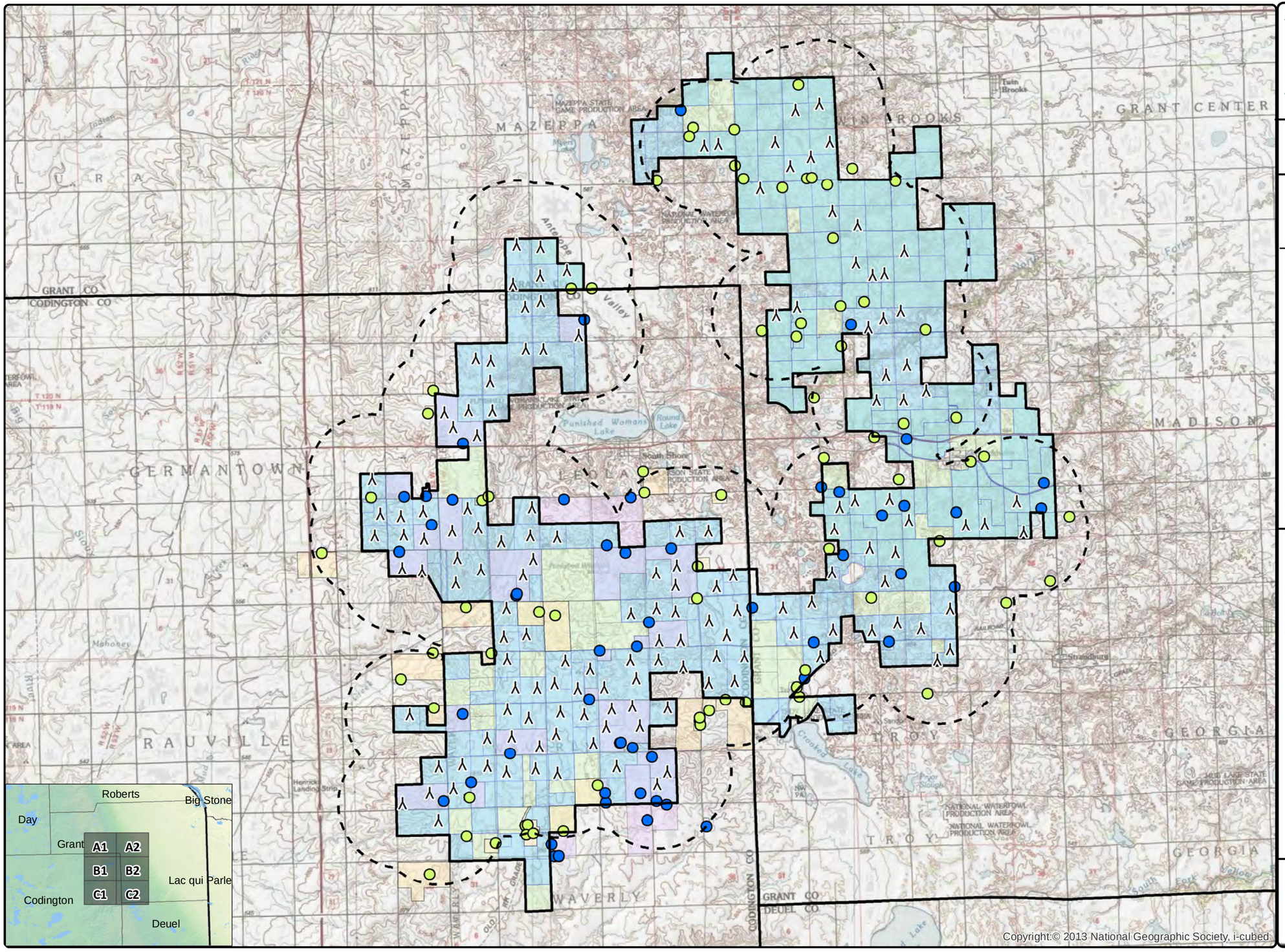
The conservative results of this sound study indicate that the Crowned Ridge Project is in compliance with both Codington and Grant County ordinances.

For Codington County, of the 61 property boundaries modeled, the highest sound pressure level at a non-participating property boundary is 48.8 dBA and none measured more than 50 dBA. Therefore the Crowned Ridge wind farms would be in compliance with Codington County Ordinance #68.

For Grant County, the sound study indicates that the highest sound pressure level 25 feet from the perimeter of a non-participating occupied structure is 43 dBA. The highest sound pressure level 25 feet from the perimeter of a participating occupied structure is 45.3 dBA. Therefore the project would be in compliance with the current Grant County Ordinance 2016-01C.

The results of this study are inherently conservative due to the fact that the turbines were modeled as though they were always operating at maximum sound emission levels and in all cases, an additional 2 dBA was added to the sound level being emitted by the turbine during the modeling stage and not to the results of the sound modeling. The turbines were also modeled as though they were always downwind of each receptor, and atmospheric conditions were modeled to be most favorable for sound transmission. In addition, the receptors in Grant County were modeled 50 feet from the perimeter of the structures where the ordinance specifies 25 feet. Noise levels will be higher farther away from the perimeter.

APPENDIX A: CROWNED RIDGE WIND ENERGY PROJECT SITE OVERVIEW MAP



0 0.75 1.5 3 Mile

EAPC WIND ENERGY

www.eapc.net | 701.775.3000

Crowned Ridge Wind Farm
Project Overview Map

Client

SWCA Environmental Consultants

Project Description

Wind turbine layout with land parcels within the project footprint and existing occupied strucures and occupied Codington County land parcels within 2 km of a wind turbine.

Location: Watertown, SD

Project #: 20174430

Issue Dates

#	Description	Date
1	Original	2019.01.15

Drawn By: AS | *Checked By: JH*

Legend

- Crowned Ridge Turbines
- 2 km Turbine Buffer
- County Lines
- CR1 Project Boundary
- Non-Participants
- Participants
- Participating Codington Parcels
- Non-Part. Codington Parcels
- Participating Land Parcels
- Non-Participating Land Parcels

N W E S

APPENDIX B: WIND TURBINE COORDINATES

Crowned Ridge Wind Farm
GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14

WTG	Turbine Type	Easting (m)	Northing (m)	Base Elev. AMSL (m)	Sound Profile
CRI-1	GE2.3 116RD 90HH r2.madE	659,443	5,003,083	610.2	LNTE
CRI-2	GE2.3 116RD 90HH r2.madE	660,185	5,003,010	598.1	LNTE
CRI-3	GE2.3 116RD 90HH r2.madE	661,008	5,002,288	584.2	LNTE
CRI-4	GE2.3 116RD 90HH r2.madE	660,173	5,002,120	602.4	LNTE
CRI-5	GE2.3 116RD 90HH r2.madE	659,337	5,001,862	609.9	LNTE
CRI-6	GE2.3 116RD 90HH r2.madE	660,193	5,001,329	610.4	LNTE
CRI-7	GE2.3 116RD 90HH r2.madE	659,705	5,001,146	618.0	LNTE
CRI-8	GE2.3 116RD 90HH r2.madE	661,380	5,000,282	588.3	LNTE
CRI-9	GE2.3 116RD 90HH r2.madE	659,731	4,999,855	613.3	LNTE
CRI-10	GE2.3 116RD 90HH r2.madE	660,280	4,999,837	615.0	LNTE
CRI-11	GE2.3 116RD 90HH r2.madE	658,170	4,999,546	611.0	LNTE
CRI-12	GE2.3 116RD 90HH r2.madE	658,644	4,999,460	615.0	LNTE
CRI-13	GE2.3 116RD 90HH r2.madE	658,622	4,998,843	613.3	LNTE
CRI-14	GE2.3 116RD 90HH r2.madE	657,947	4,997,935	618.3	LNTE
CRI-15	GE2.3 116RD 90HH r2.madE	658,688	4,997,924	618.9	LNTE
CRI-16	GE2.3 116RD 90HH r2.madE	657,203	4,997,856	611.9	LNTE
CRI-17	GE2.3 116RD 90HH r2.madE	657,476	4,997,410	611.1	LNTE
CRI-18	GE2.3 116RD 90HH r2.madE	658,217	4,997,154	618.0	LNTE
CRI-19	GE2.3 116RD 90HH r2.madE	654,954	4,995,804	601.1	LNTE
CRI-20	GE2.3 116RD 90HH r2.madE	659,920	4,994,924	594.4	LNTE
CRI-21	GE2.3 116RD 90HH r2.madE	657,925	4,994,896	617.1	LNTE
CRI-22	GE2.3 116RD 90HH r2.madE	656,543	4,994,796	616.5	LNTE
CRI-23	GE2.3 116RD 90HH r2.madE	655,208	4,994,717	594.5	LNTE
CRI-24	GE2.3 116RD 90HH r2.madE	655,852	4,994,652	609.0	LNTE
CRI-25	GE2.3 116RD 90HH r2.madE	658,251	4,994,286	606.0	LNTE
CRI-26	GE2.3 116RD 90HH r2.madE	665,405	4,994,191	578.3	LNTE
CRI-27	GE2.3 116RD 90HH r2.madE	657,442	4,994,187	621.0	LNTE
CRI-28	GE2.3 116RD 90HH r2.madE	664,517	4,994,168	579.0	LNTE
CRI-29	GE2.3 116RD 90HH r2.madE	655,940	4,994,069	606.9	LNTE
CRI-30	GE2.3 116RD 90HH r2.madE	659,871	4,994,052	593.6	LNTE
CRI-31	GE2.3 116RD 90HH r2.madE	655,030	4,994,051	603.0	LNTE
CRI-32	GE2.3 116RD 90HH r2.madE	660,704	4,993,998	606.0	LNTE
CRI-33	GE2.3 116RD 90HH r2.madE	656,566	4,993,941	618.0	LNTE
CRI-34	GE2.3 116RD 90HH r2.madE	658,966	4,993,856	599.6	LNTE
CRI-35	GE2.3 116RD 90HH r2.madE	657,602	4,993,347	607.5	LNTE
CRI-36	GE2.3 116RD 90HH r2.madE	659,966	4,993,319	594.0	LNTE
CRI-37	GE2.3 116RD 90HH r2.madE	664,419	4,993,110	587.2	LNTE
CRI-38	GE2.3 116RD 90HH r2.madE	658,338	4,992,981	600.5	LNTE
CRI-39	GE2.3 116RD 90HH r2.madE	656,507	4,992,958	609.0	LNTE
CRI-40	GE2.3 116RD 90HH r2.madE	655,889	4,993,035	603.0	LNTE
CRI-41	GE2.3 116RD 90HH r2.madE	663,782	4,992,883	597.2	LNTE

Crowned Ridge Wind Farm
GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
continued

WTG	Turbine Type	Easting (m)	Northing (m)	Base Elev. AMSL (m)	Sound Profile
CRI-43	GE2.3 116RD 90HH r2.madE	666,181	4,992,815	577.8	LNTE
CRI-44	GE2.3 116RD 90HH r2.madE	665,665	4,992,460	576.0	LNTE
CRI-46	GE2.3 116RD 90HH r2.madE	664,387	4,992,505	591.0	LNTE
CRI-48	GE2.3 116RD 90HH r2.madE	663,794	4,991,782	587.5	LNTE
CRI-49	GE2.3 116RD 90HH r2.madE	664,385	4,991,685	581.6	LNTE
CRI-50	GE2.3 116RD 90HH r2.madE	662,999	4,991,622	612.0	LNTE
CRI-51	GE2.3 116RD 90HH r2.madE	666,299	4,991,723	575.3	LNTE
CRI-52	GE2.3 116RD 90HH r2.madE	665,426	4,991,398	575.6	LNTE
CRI-53	GE2.3 116RD 90HH r2.madE	659,750	4,990,981	598.7	LNTE
CRI-54	GE2.3 116RD 90HH r2.madE	665,979	4,990,946	573.7	LNTE
CRI-55	GE2.3 116RD 90HH r2.madE	659,045	4,990,899	597.0	LNTE
CRI-56	GE2.3 116RD 90HH r2.madE	664,548	4,990,794	591.9	LNTE
CRI-57	GE2.3 116RD 90HH r2.madE	663,874	4,990,787	600.1	LNTE
CRI-58	GE2.3 116RD 90HH r2.madE	665,663	4,990,303	585.0	LNTE
CRI-59	GE2.3 116RD 90HH r2.madE	666,523	4,990,291	573.0	LNTE
CRI-60	GE2.3 116RD 90HH r2.madE	659,155	4,990,208	593.9	LNTE
CRI-61	GE2.3 116RD 90HH r2.madE	662,982	4,990,178	612.0	LNTE
CRI-62	GE2.3 116RD 90HH r2.madE	660,954	4,990,155	600.8	LNTE
CRI-63	GE2.3 116RD 90HH r2.madE	664,627	4,989,977	588.7	LNTE
CRI-64	GE2.3 116RD 90HH r2.madE	663,858	4,990,188	604.5	LNTE
CRI-65	GE2.3 116RD 90HH r2.madE	661,732	4,989,898	609.0	LNTE
CRI-66	GE2.3 116RD 90HH r2.madE	663,165	4,989,613	614.9	LNTE
CRI-67	GE2.3 116RD 90HH r2.madE	666,226	4,989,531	574.8	LNTE
CRI-68	GE2.3 116RD 90HH r2.madE	665,420	4,989,461	585.0	LNTE
CRI-69	GE2.3 116RD 80HH r2.madE	660,621	4,989,453	605.4	LNTE
CRI-70	GE2.3 116RD 90HH r2.madE	662,171	4,989,319	611.0	LNTE
CRI-71	GE2.3 116RD 80HH r2.madE	659,405	4,989,320	607.4	LNTE
CRI-72	GE2.3 116RD 80HH r2.madE	660,087	4,989,309	606.0	LNTE
CRI-73	GE2.3 116RD 90HH r2.madE	661,344	4,989,297	609.8	LNTE
CRI-74	GE2.3 116RD 90HH r2.madE	663,041	4,988,744	615.0	LNTE
CRI-75	GE2.3 116RD 90HH r2.madE	664,137	4,988,702	609.0	LNTE
CRI-76	GE2.3 116RD 90HH r2.madE	662,399	4,988,667	615.0	LNTE
CRI-77	GE2.3 116RD 80HH r2.madE	659,158	4,988,642	612.0	LNTE
CRI-78	GE2.3 116RD 80HH r2.madE	660,811	4,988,558	604.2	LNTE
CRI-79	GE2.3 116RD 90HH r2.madE	656,125	4,988,485	595.0	LNTE
CRI-80	GE2.3 116RD 90HH r2.madE	661,552	4,988,481	608.8	LNTE
CRI-81	GE2.3 116RD 90HH r2.madE	659,825	4,988,365	606.5	LNTE
CRI-82	GE2.3 116RD 90HH r2.madE	663,271	4,988,133	613.0	LNTE
CRI-83	GE2.3 116RD 90HH r2.madE	662,227	4,988,103	606.5	LNTE
CRI-84	GE2.3 116RD 80HH r2.madE	660,677	4,987,880	600.5	LNTE
CRI-85	GE2.3 116RD 90HH r2.madE	659,295	4,987,798	612.0	LNTE

Crowned Ridge Wind Farm
GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
continued

WTG	Turbine Type	Easting (m)	Northing (m)	Base Elev. AMSL (m)	Sound Profile
CRI-86	GE2.3 116RD 90HH r2.madE	658,534	4,987,759	613.3	LNTE
CRI-87	GE2.3 116RD 90HH r2.madE	661,830	4,987,596	609.0	LNTE
CRI-88	GE2.3 116RD 90HH r2.madE	660,157	4,987,492	603.0	LNTE
CRI-89	GE2.3 116RD 80HH r2.madE	657,758	4,986,926	614.9	LNTE
CRI-90	GE2.3 116RD 80HH r2.madE	658,545	4,986,881	612.0	LNTE
CRI-91	GE2.3 116RD 80HH r2.madE	657,023	4,986,868	612.0	LNTE
CRI-92	GE2.3 116RD 80HH r2.madE	660,039	4,986,804	606.9	LNTE
CRI-93	GE2.3 116RD 80HH r2.madE	659,133	4,986,700	608.0	LNTE
CRI-94	GE2.3 116RD 80HH r2.madE	660,716	4,986,660	600.7	LNTE
CRI-95	GE2.3 116RD 90HH r2.madE	657,488	4,986,184	612.0	LNTE
CRI-96	GE2.3 116RD 90HH r2.madE	656,744	4,986,037	609.0	LNTE
CRI-97	GE2.3 116RD 80HH r2.madE	655,899	4,985,715	592.6	LNTE
CRI-98	GE2.3 116RD 90HH r2.madE	657,015	4,985,192	609.0	LNTE
CRI-99	GE2.3 116RD 90HH r2.madE	672,521	4,990,188	556.7	LNTE
CRI-100	GE2.3 116RD 90HH r2.madE	668,885	4,990,286	585.0	LNTE
CRI-101	GE2.3 116RD 90HH r2.madE	672,921	4,990,513	544.6	LNTE
CRI-102	GE2.3 116RD 90HH r2.madE	668,059	4,991,023	580.9	LNTE
CRI-103	GE2.3 116RD 90HH r2.madE	669,279	4,991,115	582.0	LNTE
CRI-104	GE2.3 116RD 90HH r2.madE	672,009	4,991,151	555.0	LNTE
CRI-105	GE2.3 116RD 90HH r2.madE	670,488	4,991,091	571.7	LNTE
CRI-106	GE2.3 116RD 90HH r2.madE	671,278	4,991,335	567.0	LNTE
CRI-107	GE2.3 116RD 90HH r2.madE	667,723	4,991,800	582.0	LNTE
CRI-108	GE2.3 116RD 90HH r2.madE	672,917	4,991,775	541.2	LNTE
CRI-109	GE2.3 116RD 90HH r2.madE	670,897	4,992,616	557.3	LNTE
CRI-111	GE2.3 116RD 90HH r2.madE	671,220	4,993,526	550.6	LNTE
CRI-112	GE2.3 116RD 90HH r2.madE	670,419	4,993,665	561.0	LNTE
CRI-113	GE2.3 116RD 90HH r2.madE	675,201	4,994,165	497.6	LNTE
CRI-114	GE2.3 116RD 90HH r2.madE	669,318	4,994,256	561.8	LNTE
CRI-115	GE2.3 116RD 90HH r2.madE	673,402	4,994,374	516.4	LNTE
CRI-116	GE2.3 116RD 90HH r2.madE	671,642	4,994,527	531.0	LNTE
CRI-117	GE2.3 116RD 90HH r2.madE	669,488	4,994,930	545.6	LNTE
CRI-118	GE2.3 116RD 90HH r2.madE	669,961	4,995,134	540.3	LNTE
CRI-119	GE2.3 116RD 90HH r2.madE	674,992	4,995,107	492.0	LNTE
CRI-120	GE2.3 116RD 90HH r2.madE	671,034	4,995,179	536.2	LNTE
CRI-121	GE2.3 116RD 90HH r2.madE	670,629	4,998,259	531.0	LNTE
CRI-122	GE2.3 116RD 90HH r2.madE	671,475	4,998,261	517.8	LNTE
CRI-123	GE2.3 116RD 90HH r2.madE	672,180	4,998,561	505.0	LNTE
CRI-124	GE2.3 116RD 90HH r2.madE	670,926	4,999,036	523.3	LNTE
CRI-125	GE2.3 116RD 90HH r2.madE	671,580	4,999,340	509.8	LNTE
CRI-126	GE2.3 116RD 90HH r2.madE	670,382	5,000,519	516.0	LNTE
CRI-127	GE2.3 116RD 90HH r2.madE	670,845	5,000,795	507.4	LNTE

Crowned Ridge Wind Farm
GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
continued

WTG	Turbine Type	Easting (m)	Northing (m)	Base Elev. AMSL (m)	Sound Profile
CRI-128	GE2.3 116RD 90HH r2.madE	671,388	5,001,034	498.4	LNTE
CRI-129	GE2.3 116RD 90HH r2.madE	667,516	5,000,900	553.8	LNTE
CRI-130	GE2.3 116RD 90HH r2.madE	668,158	5,001,149	546.0	LNTE
CRI-131	GE2.3 116RD 90HH r2.madE	670,512	5,002,137	504.0	LNTE
CRI-132	GE2.3 116RD 90HH r2.madE	670,875	5,002,186	499.0	LNTE
CRI-133	GE2.3 116RD 90HH r2.madE	669,990	5,002,521	502.6	LNTE
CRI-134	GE2.3 116RD 90HH r2.madE	671,497	5,002,893	483.0	LNTE
CRI-Alt1	GE2.3 116RD 90HH r2.madE	673,995	4,994,412	508.0	LNTE
CRI-Alt2	GE2.3 116RD 90HH r2.madE	669,250	4,992,900	562.3	LNTE
CRI-Alt3	GE2.3 116RD 90HH r2.madE	668,624	4,991,988	581.3	LNTE
CRI-Alt4	GE2.3 116RD 90HH r2.madE	670,047	5,003,703	495.4	LNTE
CRI-Alt7	GE2.3 116RD 90HH r2.madE	669,265	5,004,141	504.3	LNTE
CRI-Alt8	GE2.3 116RD 90HH r2.madE	667,012	5,004,840	525.5	LNTE
CRI-Alt9	GE2.3 116RD 90HH r2.madE	667,945	5,005,534	511.0	LNTE
CRI-Alt11	GE2.3 116RD 90HH r2.madE	668,585	5,005,813	499.5	LNTE
CRI-Alt12	GE2.3 116RD 90HH r2.madE	665,718	5,006,213	532.5	LNTE
CRI-Alt14	GE2.3 116RD 90HH r2.madE	667,485	5,006,268	514.9	LNTE
CRI-Alt15	GE2.3 116RD 90HH r2.madE	669,174	5,006,282	480.8	LNTE
CRI-Alt16	GE2.3 116RD 90HH r2.madE	665,280	5,006,161	540.0	LNTE
CRI-Alt17	GE2.3 116RD 90HH r2.madE	668,112	5,007,271	490.7	LNTE
CRI-Alt18	GE2.3 116RD 90HH r2.madE	668,857	5,007,463	475.0	LNTE
CRI-Alt19	GE2.3 116RD 90HH r2.madE	663,816	4,986,314	613.1	LNTE
CRI-Alt20	GE2.3 116RD 90HH r2.madE	664,124	4,986,705	611.8	LNTE
CRI-Alt22	GE2.3 116RD 90HH r2.madE	662,551	4,986,877	614.6	LNTE
CRI-Alt42	GE2.3 116RD 90HH r2.madE	659,646	4,992,833	585.0	LNTE
CRI-Alt45	GE2.3 116RD 90HH r2.madE	657,553	4,992,576	599.8	LNTE
CRI-Alt47	GE2.3 116RD 90HH r2.madE	659,131	4,991,788	579.0	LNTE

APPENDIX C: TABLE OF SOUND RESULTS

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C1-NP	Non-P	Boundary	657,276	4,983,921	590.3	36.4	4,203
CR1-C2-NP	Non-P	Boundary	658,435	4,984,609	601.8	37.6	5,036
CR1-C3-NP	Non-P	Boundary	657,812	4,984,785	603.1	39.4	2,936
CR1-C4-NP	Non-P	Boundary	659,890	4,985,620	605.4	40.5	3,914
CR1-C6-P	Participant	Boundary	663,383	4,994,502	591.0	38.4	3,878
CR1-C7-NP	Non-P	Boundary	661,266	4,985,387	591.0	46.6	1,253
CR1-C8-P	Participant	Boundary	661,277	4,984,852	597.6	43.1	2,139
CR1-C9-P	Participant	Boundary	665,421	4,985,265	609.0	49.5	1,079
CR1-C10-P	Participant	Boundary	662,869	4,985,477	601.4	52.2	610
CR1-C11-P	Participant	Boundary	664,444	4,985,206	608.6	52.0	738
CR1-C12-P	Participant	Boundary	662,067	4,985,677	604.9	45.3	1,591
CR1-C13-P	Participant	Boundary	664,410	4,986,207	615.0	53.3	591
CR1-C14-NP	Non-P	Boundary	657,803	4,986,003	609.0	46.1	1,191
CR1-C15-P	Participant	Boundary	663,047	4,985,700	612.8	51.1	692
CR1-C16-NP	Non-P	Boundary	661,642	4,985,677	597.0	48.8	948
CR1-C17-P	Participant	Boundary	658,017	4,986,369	606.4	45.2	1,837
CR1-C18-P	Participant	Boundary	664,126	4,986,525	610.2	52.4	597
CR1-C19-P	Participant	Boundary	660,393	4,987,529	607.7	50.1	761
CR1-C20-P	Participant	Boundary	662,024	4,987,612	604.8	51.0	682
CR1-C26-P	Participant	Boundary	658,015	4,987,993	606.0	43.5	1,867
CR1-C27-NP	Non-P	Boundary	656,658	4,988,484	587.2	42.1	1,752
CR1-C28-NP	Non-P	Boundary	665,432	4,989,009	583.9	44.9	1,483
CR1-C29-NP	Non-P	Boundary	666,496	4,989,001	573.9	42.7	1,952
CR1-C30-P	Participant	Boundary	661,978	4,989,318	613.3	51.3	718
CR1-C31-NP	Non-P	Boundary	665,639	4,989,013	584.6	44.5	1,637
CR1-C32-NP	Non-P	Boundary	657,187	4,989,566	573.0	38.1	4,970
CR1-C33-NP	Non-P	Boundary	657,126	4,990,843	567.0	38.0	5,856
CR1-C34-NP	Non-P	Boundary	658,763	4,990,247	589.7	45.8	1,286
CR1-C35-P	Participant	Boundary	661,955	4,990,153	606.0	47.2	1,112
CR1-C36-P	Participant	Boundary	663,564	4,990,731	610.7	48.2	1,033
CR1-C37-P	Participant	Boundary	663,879	4,990,574	594.0	51.1	699
CR1-C38-NP	Non-P	Boundary	660,955	4,990,468	591.2	47.3	1,027
CR1-C39-NP	Non-P	Boundary	659,741	4,991,242	583.2	48.5	856
CR1-C40-NP	Non-P	Boundary	658,706	4,991,231	579.8	44.9	1,555
CR1-C41-NP	Non-P	Boundary	664,801	4,991,929	577.1	46.1	1,585
CR1-C42-P	Participant	Boundary	659,828	4,992,807	580.5	51.1	604
CR1-C44-NP	Non-P	Boundary	665,447	4,992,972	578.2	44.4	1,801
CR1-C45-NP	Non-P	Boundary	653,821	4,993,552	572.0	36.5	4,291
CR1-C46-P	Participant	Boundary	656,678	4,992,970	611.5	51.4	561

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C47-P	Participant	Boundary	663,454	4,992,888	612.0	46.8	1,076
CR1-C48-P	Participant	Boundary	664,262	4,992,514	586.8	53.6	577
CR1-C49-P	Participant	Boundary	662,224	4,993,664	609.0	38.4	5,105
CR1-C50-P	Participant	Boundary	656,239	4,994,042	618.0	49.6	984
CR1-C51-P	Participant	Boundary	657,753	4,994,889	620.0	51.4	564
CR1-C52-NP	Non-P	Boundary	654,986	4,995,398	603.0	45.1	1,335
CR1-C53-NP	Non-P	Boundary	664,171	4,995,340	580.6	37.3	4,009
CR1-C54-NP	Non-P	Boundary	663,495	4,995,329	582.9	36.5	5,075
CR1-C55-P	Participant	Boundary	660,139	4,994,937	606.2	49.4	722
CR1-C56-P	Participant	Boundary	655,392	4,995,175	606.2	44.9	1,621
CR1-C57-P	Participant	Boundary	656,526	4,995,198	616.1	45.4	1,319
CR1-C58-P	Participant	Boundary	657,619	4,997,581	611.9	50.4	732
CR1-C59-P	Participant	Boundary	661,380	5,000,092	591.0	50.2	623
CR1-C60-NP	Non-P	Boundary	656,909	4,998,465	609.3	41.3	2,218
CR1-C61-NP	Non-P	Boundary	656,927	4,997,826	612.0	47.8	912
CR1-C62-NP	Non-P	Boundary	658,155	4,994,994	614.7	48.6	820
CR1-C63-NP	Non-P	Boundary	658,543	4,995,211	606.8	42.3	2,277
CR1-C64-P	Participant	Boundary	659,129	4,991,995	576.5	49.9	679
CR1-C65-NP	Non-P	Boundary	665,516	4,995,045	578.0	39.1	2,825
CR1-C70-NP	Non-P	Boundary	664,953	4,987,981	596.1	42.7	2,940
CR1-C71-NP	Non-P	Boundary	664,658	4,987,355	600.0	48.6	909
CR2-C150-P	Participant	Boundary	657,308	4,986,173	600.0	51.3	591
CR1-C1-NP	Non-P	Structure	656,743	4,983,525	595.9	34.9	4,203
CR1-C2-NP	Non-P	Structure	658,791	4,984,483	601.6	37.3	5,036
CR1-C3-NP	Non-P	Structure	657,888	4,984,697	604.2	38.8	2,936
CR1-C4-NP	Non-P	Structure	659,744	4,984,749	605.9	38.5	3,914
CR1-C5-NP	Non-P	Structure	659,958	4,984,794	605.2	38.8	5,659
CR1-C6-P	Participant	Structure	662,989	4,995,228	599.8	36.3	3,878
CR1-C7-NP	Non-P	Structure	660,893	4,984,861	593.2	41.3	1,253
CR1-C8-P	Participant	Structure	660,532	4,984,445	599.7	40.1	2,139
CR1-C9-P	Participant	Structure	665,352	4,985,004	609.0	47.7	1,079
CR1-C10-P	Participant	Structure	663,510	4,985,195	609.0	47.0	610
CR1-C11-P	Participant	Structure	664,111	4,985,679	609.0	47.9	738
CR1-C12-P	Participant	Structure	662,222	4,985,736	603.0	44.3	1,591
CR1-C12-1-P	Participant	Structure	662,199	4,986,047	606.0	43.6	2,818
CR1-C13-P	Participant	Structure	663,792	4,985,785	612.0	46.9	591
CR1-C14-NP	Non-P	Structure	657,982	4,985,894	609.0	43.4	1,191
CR1-C15-P	Participant	Structure	663,291	4,986,026	615.0	46.1	692

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C16-NP	Non-P	Structure	661,960	4,986,288	606.0	43.3	948
CR1-C17-P	Participant	Structure	658,031	4,986,373	609.1	45.1	1,837
CR1-C18-P	Participant	Structure	663,651	4,987,157	610.5	44.8	597
CR1-C19-P	Participant	Structure	659,243	4,987,276	611.5	46.4	761
CR1-C20-P	Participant	Structure	663,054	4,987,455	606.0	44.5	682
CR1-C21-P	Participant	Structure	660,756	4,984,086	594.8	42.0	2,388
CR1-C22-P	Participant	Structure	660,755	4,984,082	594.8	42.0	2,375
CR1-C23-P	Participant	Structure	660,619	4,984,078	596.0	41.5	2,523
CR1-C26-P	Participant	Structure	657,767	4,988,493	597.0	40.6	1,867
CR1-C27-NP	Non-P	Structure	656,876	4,988,683	583.0	40.0	1,752
CR1-C28-NP	Non-P	Structure	665,429	4,988,598	590.8	42.1	1,483
CR1-C29-NP	Non-P	Structure	666,572	4,988,867	575.9	41.4	1,952
CR1-C30-P	Participant	Structure	661,699	4,988,957	615.0	47.9	718
CR1-C31-NP	Non-P	Structure	665,939	4,988,950	585.4	43.4	1,637
CR1-C32-NP	Non-P	Structure	655,843	4,989,581	568.6	37.0	4,970
CR1-C33-NP	Non-P	Structure	656,839	4,990,404	569.8	37.3	5,856
CR1-C34-NP	Non-P	Structure	658,661	4,990,389	589.1	44.5	1,286
CR1-C35-P	Participant	Structure	662,025	4,990,475	609.0	43.9	1,112
CR1-C36-P	Participant	Structure	663,181	4,990,600	615.0	46.2	1,033
CR1-C37-P	Participant	Structure	663,563	4,991,342	605.1	46.5	699
CR1-C38-NP	Non-P	Structure	660,639	4,991,557	597.0	40.9	1,027
CR1-C39-NP	Non-P	Structure	660,144	4,991,670	588.0	42.2	856
CR1-C40-NP	Non-P	Structure	657,865	4,991,818	583.8	41.5	1,555
CR1-C41-NP	Non-P	Structure	665,053	4,992,084	576.1	45.0	1,585
CR1-C42-P	Participant	Structure	659,458	4,992,229	580.0	44.6	604
CR1-C44-NP	Non-P	Structure	665,076	4,993,095	578.2	44.0	1,801
CR1-C45-NP	Non-P	Structure	653,390	4,993,503	573.0	34.8	4,291
CR1-C46-P	Participant	Structure	655,802	4,993,540	609.7	45.9	561
CR1-C47-P	Participant	Structure	662,825	4,993,508	613.8	39.4	1,076
CR1-C48-P	Participant	Structure	664,247	4,993,646	588.0	44.7	577
CR1-C49-P	Participant	Structure	662,250	4,993,731	609.0	38.3	5,105
CR1-C50-P	Participant	Structure	656,806	4,994,388	621.0	46.7	984
CR1-C51-P	Participant	Structure	657,455	4,995,160	621.0	43.9	564
CR1-C52-NP	Non-P	Structure	654,924	4,995,231	603.0	44.0	1,335
CR1-C53-NP	Non-P	Structure	663,376	4,996,043	578.6	35.1	4,009
CR1-C54-NP	Non-P	Structure	663,421	4,995,376	583.4	36.3	5,075
CR1-C55-P	Participant	Structure	660,914	4,995,169	607.9	39.3	722
CR1-C56-P	Participant	Structure	655,953	4,995,244	606.0	43.9	1,621

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C57-P	Participant	Structure	656,628	4,995,266	615.0	44.2	1,319
CR1-C58-P	Participant	Structure	657,781	4,996,906	615.0	44.8	732
CR1-C59-P	Participant	Structure	661,548	5,000,754	584.1	42.5	623
CR1-C60-NP	Non-P	Structure	656,855	4,998,565	613.5	40.3	2,218
CR1-C61-NP	Non-P	Structure	656,690	4,997,831	612.0	43.1	912
CR1-C62-NP	Non-P	Structure	658,375	4,995,138	615.0	43.9	820
CR1-C63-NP	Non-P	Structure	658,566	4,995,254	612.6	41.9	2,277
CR1-C64-P	Participant	Structure	659,436	4,992,174	581.0	44.8	679
CR1-C65-NP	Non-P	Structure	665,805	4,995,305	579.0	37.3	2,825
CR1-C66-NP	Non-P	Structure	659,718	4,985,032	606.0	38.9	5,800
CR1-C67-NP	Non-P	Structure	659,789	4,985,057	606.0	39.0	5,791
CR1-C68-P	Participant	Structure	662,652	4,987,606	609.0	45.4	2,146
CR1-C69-P	Participant	Structure	662,685	4,987,619	609.0	45.3	2,185
CR1-C70-NP	Non-P	Structure	665,135	4,988,293	595.7	42.0	2,940
CR1-C71-NP	Non-P	Structure	665,137	4,988,378	594.6	42.1	909
CR1-C72-NP	Non-P	Structure	665,158	4,988,170	595.2	42.1	3,776
CR2-C150-P	Participant	Structure	657,178	4,985,788	612.0	46.1	591

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results Structure occupied structures and accessory structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Grant County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G12-NP	Non-P	Structure	668,229	4,989,039	575.0	38.0	4,623
CR1-G13-NP	Non-P	Structure	672,216	4,989,142	558.0	37.2	3,576
CR1-G14-NP	Non-P	Structure	668,156	4,989,332	574.1	38.7	3,940
CR1-G15-P	Participant	Structure	668,396	4,989,607	576.0	40.0	2,746
CR1-G16-NP	Non-P	Structure	668,419	4,989,861	576.0	41.8	2,070
CR1-G18-P	Participant	Structure	668,678	4,990,722	585.0	45.1	1,585
CR1-G19-P	Participant	Structure	671,018	4,990,744	570.0	43.4	2,077
CR1-G21-P	Participant	Structure	666,766	4,991,807	577.1	44.9	1,555
CR1-G22-NP	Non-P	Structure	674,670	4,991,955	527.6	34.8	5,781
CR1-G23-NP	Non-P	Structure	670,471	4,992,104	560.1	42.5	2,185
CR1-G24-P	Participant	Structure	673,058	4,992,440	539.4	40.5	2,231
CR1-G25-P	Participant	Structure	671,391	4,992,858	549.0	43.8	1,804
CR1-G26-NP	Non-P	Structure	672,589	4,993,869	531.0	39.9	3,140
CR1-G27-NP	Non-P	Structure	676,630	4,994,642	480.8	33.9	4,944
CR1-G28-P	Participant	Structure	673,113	4,994,772	514.1	43.2	1,614
CR1-G32-P	Participant	Structure	669,477	4,995,401	546.0	45.1	1,545
CR1-G33-P	Participant	Structure	668,911	4,995,550	548.7	39.9	2,779
CR1-G34-NP	Non-P	Structure	671,320	4,995,798	531.0	40.8	2,238
CR1-G36-NP	Non-P	Structure	673,559	4,996,344	498.1	35.4	6,211
CR1-G37-NP	Non-P	Structure	668,998	4,996,452	549.0	36.6	5,246
CR1-G38-NP	Non-P	Structure	673,972	4,996,493	494.5	35.0	5,646
CR1-G41-P	Participant	Structure	671,563	4,997,050	497.7	37.9	3,983
CR1-G42-NP	Non-P	Structure	670,566	4,997,097	518.9	38.0	3,819
CR1-G43-NP	Non-P	Structure	661,141	5,001,721	584.2	42.7	1,909
CR1-G44-NP	Non-P	Structure	661,781	5,001,732	583.7	38.6	3,123
CR1-G59-P	Participant	Structure	675,755	4,994,888	488.3	39.6	2,605
CR1-G60-P	Participant	Structure	675,830	4,995,687	477.0	36.3	3,343
CR1-G65-P	Participant	Structure	671,496	4,994,973	537.0	45.3	1,539
CR1-G66-P	Participant	Structure	670,802	4,994,681	539.8	44.0	1,801
CR1-G67-P	Participant	Structure	669,597	4,993,440	555.8	43.2	2,106
CR1-G68-NP	Non-P	Structure	669,159	4,993,632	564.7	43.0	2,113
CR1-G77-NP	Non-P	Structure	676,031	4,992,629	503.1	33.2	5,728
CR1-G81-NP	Non-P	Structure	671,478	4,997,523	508.7	40.7	2,421
CR1-G105-NP	Non-P	Structure	668,696	4,998,325	549.0	35.2	6,345
CR1-G108-NP	Non-P	Structure	669,516	5,001,186	522.2	39.7	3,586
CR1-G109-NP	Non-P	Structure	667,064	5,000,425	566.4	40.0	2,152
CR1-G110-NP	Non-P	Structure	671,218	5,005,064	456.4	34.7	5,889
CR1-G113-NP	Non-P	Structure	666,228	5,005,549	537.0	40.2	2,746

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results Structure occupied structures and accessory structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Grant County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G114-NP	Non-P	Structure	666,214	5,006,667	520.8	40.7	2,205
CR1-G115-NP	Non-P	Structure	664,933	5,006,731	544.6	40.4	2,188
CR1-G117-NP	Non-P	Structure	663,801	5,005,084	581.3	33.0	6,004
CR1-G124-P	Participant	Structure	669,843	5,000,605	525.0	42.7	1,791
CR1-G125-NP	Non-P	Structure	668,289	5,000,643	543.0	42.8	1,716
CR1-G126-NP	Non-P	Structure	672,157	5,000,446	484.3	39.3	3,176
CR1-G127-NP	Non-P	Structure	669,534	4,999,939	533.9	38.7	3,369
CR1-G128-NP	Non-P	Structure	670,242	5,001,314	513.0	42.8	2,612
CR1-G129-NP	Non-P	Structure	673,111	4,997,703	477.8	36.3	4,153
CR1-G130-NP	Non-P	Structure	668,147	5,000,233	549.0	39.3	3,005
CR1-G131-NP	Non-P	Structure	668,466	5,005,145	505.1	42.9	2,133
CR1-G132-NP	Non-P	Structure	669,098	5,004,948	501.0	40.6	2,703
CR1-G133-NP	Non-P	Structure	669,881	5,005,460	478.8	38.3	3,556
CR1-G135-NP	Non-P	Structure	668,616	5,005,161	504.2	42.5	2,142
CR1-G136-NP	Non-P	Structure	667,706	5,004,861	522.0	42.2	2,277
CR1-G137-NP	Non-P	Structure	666,501	5,005,136	529.5	41.5	1,939
CR1-G138-NP	Non-P	Structure	664,809	5,006,456	549.0	41.7	1,824
CR1-G139-NP	Non-P	Structure	668,199	5,008,062	475.9	39.8	2,612
CR1-G140-P	Participant	Structure	664,546	5,007,269	551.1	34.6	4,360

Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C16-NP	Non-P	Boundary	661,642	4,985,677	597.0	48.8	948
CR1-C62-NP	Non-P	Boundary	658,155	4,994,994	614.7	48.6	820
CR1-C71-NP	Non-P	Boundary	664,658	4,987,355	600.0	48.6	909
CR1-C39-NP	Non-P	Boundary	659,741	4,991,242	583.2	48.5	856
CR1-C61-NP	Non-P	Boundary	656,927	4,997,826	612.0	47.8	912
CR1-C38-NP	Non-P	Boundary	660,955	4,990,468	591.2	47.3	1,027
CR1-C7-NP	Non-P	Boundary	661,266	4,985,387	591.0	46.6	1,253
CR1-C14-NP	Non-P	Boundary	657,803	4,986,003	609.0	46.1	1,191
CR1-C41-NP	Non-P	Boundary	664,801	4,991,929	577.1	46.1	1,585
CR1-C34-NP	Non-P	Boundary	658,763	4,990,247	589.7	45.8	1,286
CR1-C52-NP	Non-P	Boundary	654,986	4,995,398	603.0	45.1	1,335
CR1-C28-NP	Non-P	Boundary	665,432	4,989,009	583.9	44.9	1,483
CR1-C40-NP	Non-P	Boundary	658,706	4,991,231	579.8	44.9	1,555
CR1-C31-NP	Non-P	Boundary	665,639	4,989,013	584.6	44.5	1,637
CR1-C44-NP	Non-P	Boundary	665,447	4,992,972	578.2	44.4	1,801
CR1-C70-NP	Non-P	Boundary	664,953	4,987,981	596.1	42.7	2,940
CR1-C29-NP	Non-P	Boundary	666,496	4,989,001	573.9	42.7	1,952
CR1-C63-NP	Non-P	Boundary	658,543	4,995,211	606.8	42.3	2,277
CR1-C27-NP	Non-P	Boundary	656,658	4,988,484	587.2	42.1	1,752
CR1-C60-NP	Non-P	Boundary	656,909	4,998,465	609.3	41.3	2,218
CR1-C4-NP	Non-P	Boundary	659,890	4,985,620	605.4	40.5	3,914
CR1-C3-NP	Non-P	Boundary	657,812	4,984,785	603.1	39.4	2,936
CR1-C65-NP	Non-P	Boundary	665,516	4,995,045	578.0	39.1	2,825
CR1-C32-NP	Non-P	Boundary	657,187	4,989,566	573.0	38.1	4,970
CR1-C33-NP	Non-P	Boundary	657,126	4,990,843	567.0	38.0	5,856
CR1-C2-NP	Non-P	Boundary	658,435	4,984,609	601.8	37.6	5,036
CR1-C53-NP	Non-P	Boundary	664,171	4,995,340	580.6	37.3	4,009
CR1-C45-NP	Non-P	Boundary	653,821	4,993,552	572.0	36.5	4,291
CR1-C54-NP	Non-P	Boundary	663,495	4,995,329	582.9	36.5	5,075
CR1-C1-NP	Non-P	Boundary	657,276	4,983,921	590.3	36.4	4,203
CR1-C48-P	Participant	Boundary	664,262	4,992,514	586.8	53.6	577
CR1-C13-P	Participant	Boundary	664,410	4,986,207	615.0	53.3	591
CR1-C18-P	Participant	Boundary	664,126	4,986,525	610.2	52.4	597
CR1-C10-P	Participant	Boundary	662,869	4,985,477	601.4	52.2	610
CR1-C11-P	Participant	Boundary	664,444	4,985,206	608.6	52.0	738
CR1-C46-P	Participant	Boundary	656,678	4,992,970	611.5	51.4	561
CR1-C51-P	Participant	Boundary	657,753	4,994,889	620.0	51.4	564
CR1-C30-P	Participant	Boundary	661,978	4,989,318	613.3	51.3	718
CR2-C150-P	Participant	Boundary	657,308	4,986,173	600.0	51.3	591

Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C15-P	Participant	Boundary	663,047	4,985,700	612.8	51.1	692
CR1-C37-P	Participant	Boundary	663,879	4,990,574	594.0	51.1	699
CR1-C42-P	Participant	Boundary	659,828	4,992,807	580.5	51.1	604
CR1-C20-P	Participant	Boundary	662,024	4,987,612	604.8	51.0	682
CR1-C58-P	Participant	Boundary	657,619	4,997,581	611.9	50.4	732
CR1-C59-P	Participant	Boundary	661,380	5,000,092	591.0	50.2	623
CR1-C19-P	Participant	Boundary	660,393	4,987,529	607.7	50.1	761
CR1-C64-P	Participant	Boundary	659,129	4,991,995	576.5	49.9	679
CR1-C50-P	Participant	Boundary	656,239	4,994,042	618.0	49.6	984
CR1-C9-P	Participant	Boundary	665,421	4,985,265	609.0	49.5	1,079
CR1-C55-P	Participant	Boundary	660,139	4,994,937	606.2	49.4	722
CR1-C36-P	Participant	Boundary	663,564	4,990,731	610.7	48.2	1,033
CR1-C35-P	Participant	Boundary	661,955	4,990,153	606.0	47.2	1,112
CR1-C47-P	Participant	Boundary	663,454	4,992,888	612.0	46.8	1,076
CR1-C57-P	Participant	Boundary	656,526	4,995,198	616.1	45.4	1,319
CR1-C12-P	Participant	Boundary	662,067	4,985,677	604.9	45.3	1,591
CR1-C17-P	Participant	Boundary	658,017	4,986,369	606.4	45.2	1,837
CR1-C56-P	Participant	Boundary	655,392	4,995,175	606.2	44.9	1,621
CR1-C26-P	Participant	Boundary	658,015	4,987,993	606.0	43.5	1,867
CR1-C8-P	Participant	Boundary	661,277	4,984,852	597.6	43.1	2,139
CR1-C49-P	Participant	Boundary	662,224	4,993,664	609.0	38.4	5,105
CR1-C6-P	Participant	Boundary	663,383	4,994,502	591.0	38.4	3,878
CR1-C41-NP	Non-P	Structure	665,053	4,992,084	576.1	45.0	1,585
CR1-C34-NP	Non-P	Structure	658,661	4,990,389	589.1	44.5	1,286
CR1-C44-NP	Non-P	Structure	665,076	4,993,095	578.2	44.0	1,801
CR1-C52-NP	Non-P	Structure	654,924	4,995,231	603.0	44.0	1,335
CR1-C62-NP	Non-P	Structure	658,375	4,995,138	615.0	43.9	820
CR1-C14-NP	Non-P	Structure	657,982	4,985,894	609.0	43.4	1,191
CR1-C31-NP	Non-P	Structure	665,939	4,988,950	585.4	43.4	1,637
CR1-C16-NP	Non-P	Structure	661,960	4,986,288	606.0	43.3	948
CR1-C61-NP	Non-P	Structure	656,690	4,997,831	612.0	43.1	912
CR1-C39-NP	Non-P	Structure	660,144	4,991,670	588.0	42.2	856
CR1-C28-NP	Non-P	Structure	665,429	4,988,598	590.8	42.1	1,483
CR1-C71-NP	Non-P	Structure	665,137	4,988,378	594.6	42.1	909
CR1-C72-NP	Non-P	Structure	665,158	4,988,170	595.2	42.1	3,776
CR1-C70-NP	Non-P	Structure	665,135	4,988,293	595.7	42.0	2,940
CR1-C63-NP	Non-P	Structure	658,566	4,995,254	612.6	41.9	2,277
CR1-C40-NP	Non-P	Structure	657,865	4,991,818	583.8	41.5	1,555

Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C29-NP	Non-P	Structure	666,572	4,988,867	575.9	41.4	1,952
CR1-C7-NP	Non-P	Structure	660,893	4,984,861	593.2	41.3	1,253
CR1-C38-NP	Non-P	Structure	660,639	4,991,557	597.0	40.9	1,027
CR1-C60-NP	Non-P	Structure	656,855	4,998,565	613.5	40.3	2,218
CR1-C27-NP	Non-P	Structure	656,876	4,988,683	583.0	40.0	1,752
CR1-C67-NP	Non-P	Structure	659,789	4,985,057	606.0	39.0	5,791
CR1-C66-NP	Non-P	Structure	659,718	4,985,032	606.0	38.9	5,800
CR1-C3-NP	Non-P	Structure	657,888	4,984,697	604.2	38.8	2,936
CR1-C5-NP	Non-P	Structure	659,958	4,984,794	605.2	38.8	5,659
CR1-C4-NP	Non-P	Structure	659,744	4,984,749	605.9	38.5	3,914
CR1-C2-NP	Non-P	Structure	658,791	4,984,483	601.6	37.3	5,036
CR1-C33-NP	Non-P	Structure	656,839	4,990,404	569.8	37.3	5,856
CR1-C65-NP	Non-P	Structure	665,805	4,995,305	579.0	37.3	2,825
CR1-C32-NP	Non-P	Structure	655,843	4,989,581	568.6	37.0	4,970
CR1-C54-NP	Non-P	Structure	663,421	4,995,376	583.4	36.3	5,075
CR1-C53-NP	Non-P	Structure	663,376	4,996,043	578.6	35.1	4,009
CR1-C1-NP	Non-P	Structure	656,743	4,983,525	595.9	34.9	4,203
CR1-C45-NP	Non-P	Structure	653,390	4,993,503	573.0	34.8	4,291
CR1-C11-P	Participant	Structure	664,111	4,985,679	609.0	47.9	738
CR1-C30-P	Participant	Structure	661,699	4,988,957	615.0	47.9	718
CR1-C9-P	Participant	Structure	665,352	4,985,004	609.0	47.7	1,079
CR1-C10-P	Participant	Structure	663,510	4,985,195	609.0	47.0	610
CR1-C13-P	Participant	Structure	663,792	4,985,785	612.0	46.9	591
CR1-C50-P	Participant	Structure	656,806	4,994,388	621.0	46.7	984
CR1-C37-P	Participant	Structure	663,563	4,991,342	605.1	46.5	699
CR1-C19-P	Participant	Structure	659,243	4,987,276	611.5	46.4	761
CR1-C36-P	Participant	Structure	663,181	4,990,600	615.0	46.2	1,033
CR1-C15-P	Participant	Structure	663,291	4,986,026	615.0	46.1	692
CR2-C150-P	Participant	Structure	657,178	4,985,788	612.0	46.1	591
CR1-C46-P	Participant	Structure	655,802	4,993,540	609.7	45.9	561
CR1-C68-P	Participant	Structure	662,652	4,987,606	609.0	45.4	2,146
CR1-C69-P	Participant	Structure	662,685	4,987,619	609.0	45.3	2,185
CR1-C17-P	Participant	Structure	658,031	4,986,373	609.1	45.1	1,837
CR1-C18-P	Participant	Structure	663,651	4,987,157	610.5	44.8	597
CR1-C58-P	Participant	Structure	657,781	4,996,906	615.0	44.8	732
CR1-C64-P	Participant	Structure	659,436	4,992,174	581.0	44.8	679
CR1-C48-P	Participant	Structure	664,247	4,993,646	588.0	44.7	577
CR1-C42-P	Participant	Structure	659,458	4,992,229	580.0	44.6	604

Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results at land parcel boundaries and occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Codington County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C20-P	Participant	Structure	663,054	4,987,455	606.0	44.5	682
CR1-C12-P	Participant	Structure	662,222	4,985,736	603.0	44.3	1,591
CR1-C57-P	Participant	Structure	656,628	4,995,266	615.0	44.2	1,319
CR1-C35-P	Participant	Structure	662,025	4,990,475	609.0	43.9	1,112
CR1-C51-P	Participant	Structure	657,455	4,995,160	621.0	43.9	564
CR1-C56-P	Participant	Structure	655,953	4,995,244	606.0	43.9	1,621
CR1-C12-1-P	Participant	Structure	662,199	4,986,047	606.0	43.6	2,818
CR1-C59-P	Participant	Structure	661,548	5,000,754	584.1	42.5	623
CR1-C21-P	Participant	Structure	660,756	4,984,086	594.8	42.0	2,388
CR1-C22-P	Participant	Structure	660,755	4,984,082	594.8	42.0	2,375
CR1-C23-P	Participant	Structure	660,619	4,984,078	596.0	41.5	2,523
CR1-C26-P	Participant	Structure	657,767	4,988,493	597.0	40.6	1,867
CR1-C8-P	Participant	Structure	660,532	4,984,445	599.7	40.1	2,139
CR1-C47-P	Participant	Structure	662,825	4,993,508	613.8	39.4	1,076
CR1-C55-P	Participant	Structure	660,914	4,995,169	607.9	39.3	722
CR1-C49-P	Participant	Structure	662,250	4,993,731	609.0	38.3	5,105
CR1-C6-P	Participant	Structure	662,989	4,995,228	599.8	36.3	3,878

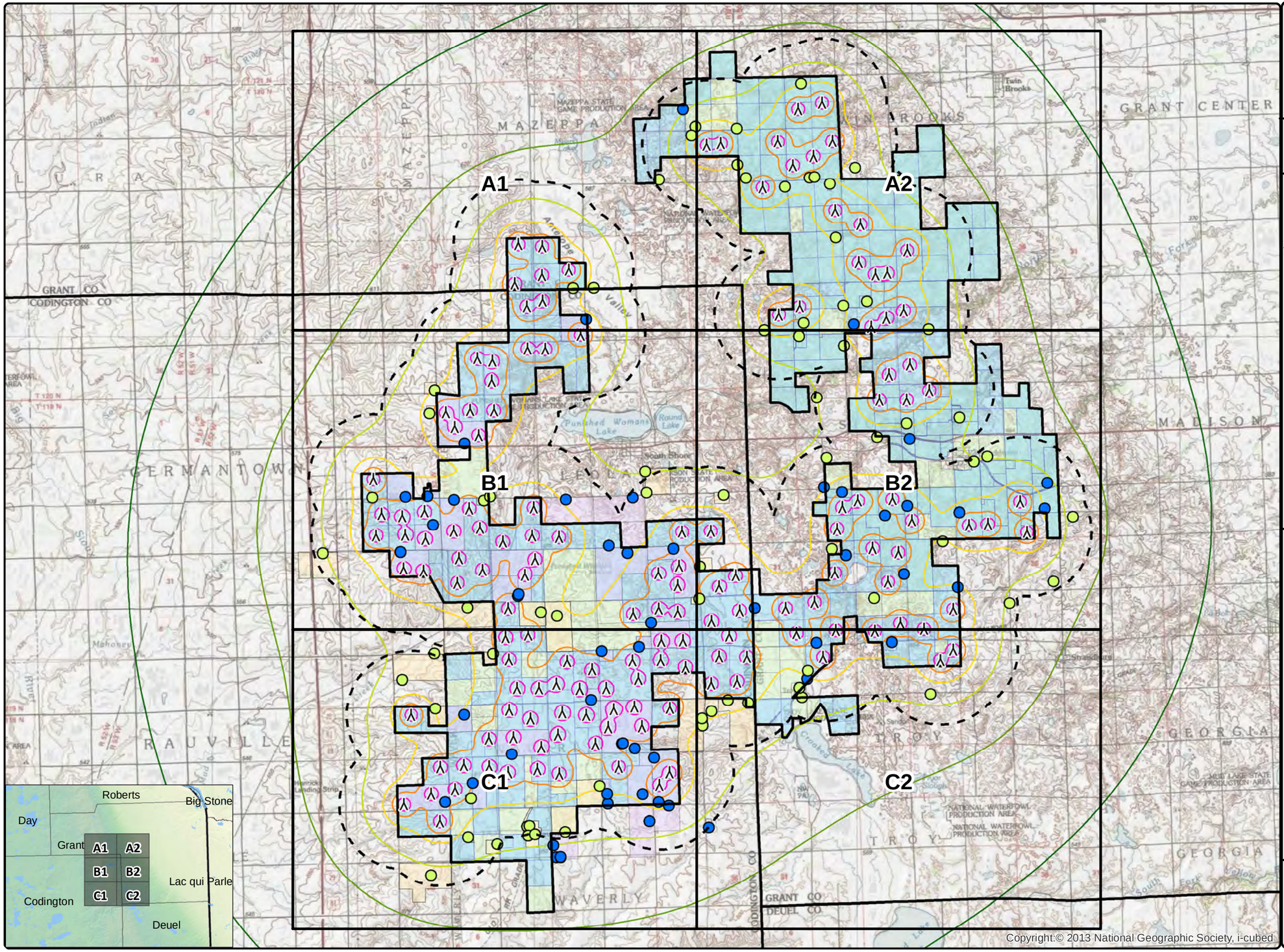
Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results Structure occupied structures and accessory structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Grant County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G68-NP	Non-P	Structure	669,159	4,993,632	564.7	43.0	2,113
CR1-G131-NP	Non-P	Structure	668,466	5,005,145	505.1	42.9	2,133
CR1-G128-NP	Non-P	Structure	670,242	5,001,314	513.0	42.8	2,612
CR1-G125-NP	Non-P	Structure	668,289	5,000,643	543.0	42.8	1,716
CR1-G43-NP	Non-P	Structure	661,141	5,001,721	584.2	42.7	1,909
CR1-G23-NP	Non-P	Structure	670,471	4,992,104	560.1	42.5	2,185
CR1-G135-NP	Non-P	Structure	668,616	5,005,161	504.2	42.5	2,142
CR1-G136-NP	Non-P	Structure	667,706	5,004,861	522.0	42.2	2,277
CR1-G16-NP	Non-P	Structure	668,419	4,989,861	576.0	41.8	2,070
CR1-G138-NP	Non-P	Structure	664,809	5,006,456	549.0	41.7	1,824
CR1-G137-NP	Non-P	Structure	666,501	5,005,136	529.5	41.5	1,939
CR1-G34-NP	Non-P	Structure	671,320	4,995,798	531.0	40.8	2,238
CR1-G81-NP	Non-P	Structure	671,478	4,997,523	508.7	40.7	2,421
CR1-G114-NP	Non-P	Structure	666,214	5,006,667	520.8	40.7	2,205
CR1-G132-NP	Non-P	Structure	669,098	5,004,948	501.0	40.6	2,703
CR1-G115-NP	Non-P	Structure	664,933	5,006,731	544.6	40.4	2,188
CR1-G113-NP	Non-P	Structure	666,228	5,005,549	537.0	40.2	2,746
CR1-G109-NP	Non-P	Structure	667,064	5,000,425	566.4	40.0	2,152
CR1-G26-NP	Non-P	Structure	672,589	4,993,869	531.0	39.9	3,140
CR1-G139-NP	Non-P	Structure	668,199	5,008,062	475.9	39.8	2,612
CR1-G108-NP	Non-P	Structure	669,516	5,001,186	522.2	39.7	3,586
CR1-G126-NP	Non-P	Structure	672,157	5,000,446	484.3	39.3	3,176
CR1-G130-NP	Non-P	Structure	668,147	5,000,233	549.0	39.3	3,005
CR1-G14-NP	Non-P	Structure	668,156	4,989,332	574.1	38.7	3,940
CR1-G127-NP	Non-P	Structure	669,534	4,999,939	533.9	38.7	3,369
CR1-G44-NP	Non-P	Structure	661,781	5,001,732	583.7	38.6	3,123
CR1-G133-NP	Non-P	Structure	669,881	5,005,460	478.8	38.3	3,556
CR1-G42-NP	Non-P	Structure	670,566	4,997,097	518.9	38.0	3,819
CR1-G12-NP	Non-P	Structure	668,229	4,989,039	575.0	38.0	4,623
CR1-G13-NP	Non-P	Structure	672,216	4,989,142	558.0	37.2	3,576
CR1-G37-NP	Non-P	Structure	668,998	4,996,452	549.0	36.6	5,246
CR1-G129-NP	Non-P	Structure	673,111	4,997,703	477.8	36.3	4,153
CR1-G36-NP	Non-P	Structure	673,559	4,996,344	498.1	35.4	6,211
CR1-G105-NP	Non-P	Structure	668,696	4,998,325	549.0	35.2	6,345
CR1-G38-NP	Non-P	Structure	673,972	4,996,493	494.5	35.0	5,646
CR1-G22-NP	Non-P	Structure	674,670	4,991,955	527.6	34.8	5,781
CR1-G110-NP	Non-P	Structure	671,218	5,005,064	456.4	34.7	5,889
CR1-G27-NP	Non-P	Structure	676,630	4,994,642	480.8	33.9	4,944

Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results Structure occupied structures and accessory structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Grant County
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-G77-NP	Non-P	Structure	676,031	4,992,629	503.1	33.2	5,728
CR1-G117-NP	Non-P	Structure	663,801	5,005,084	581.3	33.0	6,004
CR1-G65-P	Participant	Structure	671,496	4,994,973	537.0	45.3	1,539
CR1-G18-P	Participant	Structure	668,678	4,990,722	585.0	45.1	1,585
CR1-G32-P	Participant	Structure	669,477	4,995,401	546.0	45.1	1,545
CR1-G21-P	Participant	Structure	666,766	4,991,807	577.1	44.9	1,555
CR1-G66-P	Participant	Structure	670,802	4,994,681	539.8	44.0	1,801
CR1-G25-P	Participant	Structure	671,391	4,992,858	549.0	43.8	1,804
CR1-G19-P	Participant	Structure	671,018	4,990,744	570.0	43.4	2,077
CR1-G67-P	Participant	Structure	669,597	4,993,440	555.8	43.2	2,106
CR1-G28-P	Participant	Structure	673,113	4,994,772	514.1	43.2	1,614
CR1-G124-P	Participant	Structure	669,843	5,000,605	525.0	42.7	1,791
CR1-G24-P	Participant	Structure	673,058	4,992,440	539.4	40.5	2,231
CR1-G15-P	Participant	Structure	668,396	4,989,607	576.0	40.0	2,746
CR1-G33-P	Participant	Structure	668,911	4,995,550	548.7	39.9	2,779
CR1-G59-P	Participant	Structure	675,755	4,994,888	488.3	39.6	2,605
CR1-G41-P	Participant	Structure	671,563	4,997,050	497.7	37.9	3,983
CR1-G60-P	Participant	Structure	675,830	4,995,687	477.0	36.3	3,343
CR1-G140-P	Participant	Structure	664,546	5,007,269	551.1	34.6	4,360

APPENDIX D: STANDARD RESOLUTION SOUND MAPS



0 0.75 1.5 3 Mile

EAPC WIND ENERGY

www.eapc.net | 701.775.3000

Crowned Ridge Wind Farm
Sound Pressure Iso-Lines
Overview Map

Client

SWCA Environmental Consultants

Project Description

Wind turbine layout with occupied structures and parcel boundaries within 2 km.

Predicted sound pressure levels at existing residences and land parcel boundaries.

Additional 2 dBA added.

Location: Watertown, SD
Project #: 20174430

Issue Dates

#	Description	Date
1	Original	2019.01.15

Drawn By: AS *Checked By: JH*

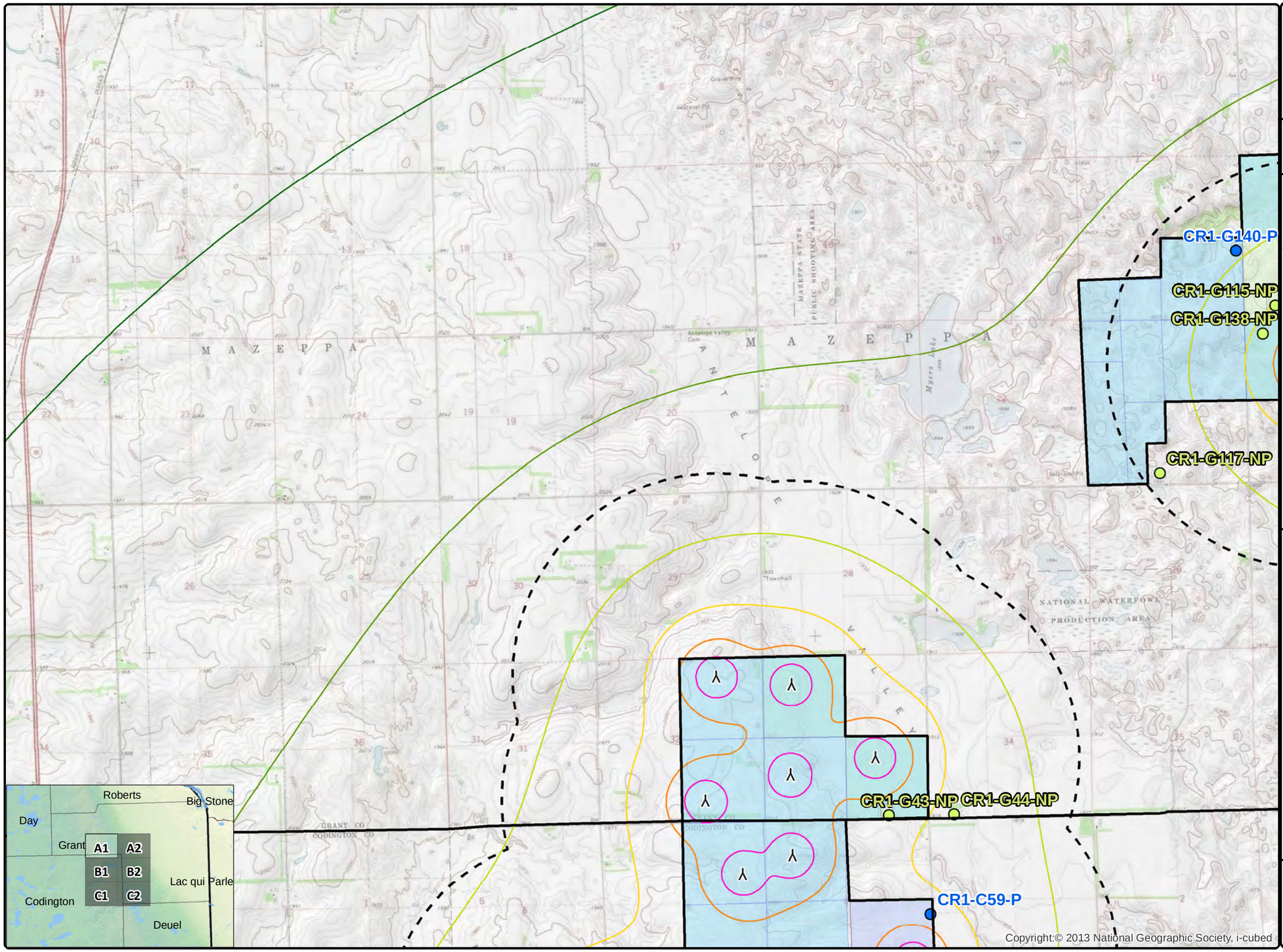
Legend

- Crowned Ridge Turbines
- 2 km Turbine Buffer
- County Lines
- CR1 Project Boundary
- Non-Participants
- Participants

Sound Pressure (dBA)

- 25
- 30
- 35
- 40
- 45
- 50
- Participating Codington Parcels
- Non-Part. Codington Parcels
- Participating Land Parcels
- Non-Participating Land Parcels

N W E S



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Crowned Ridge Wind Farm Sound Pressure Iso-Lines

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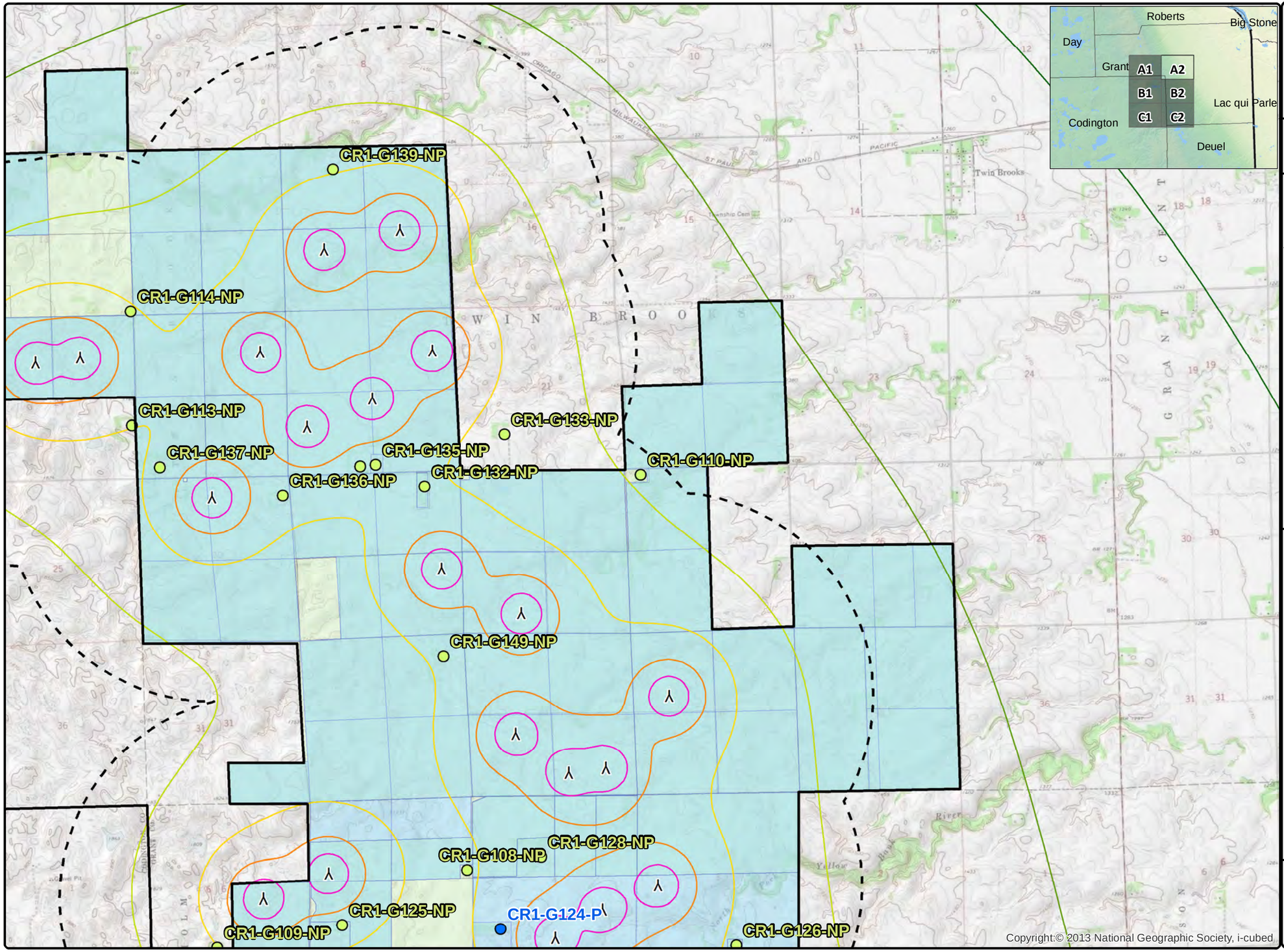

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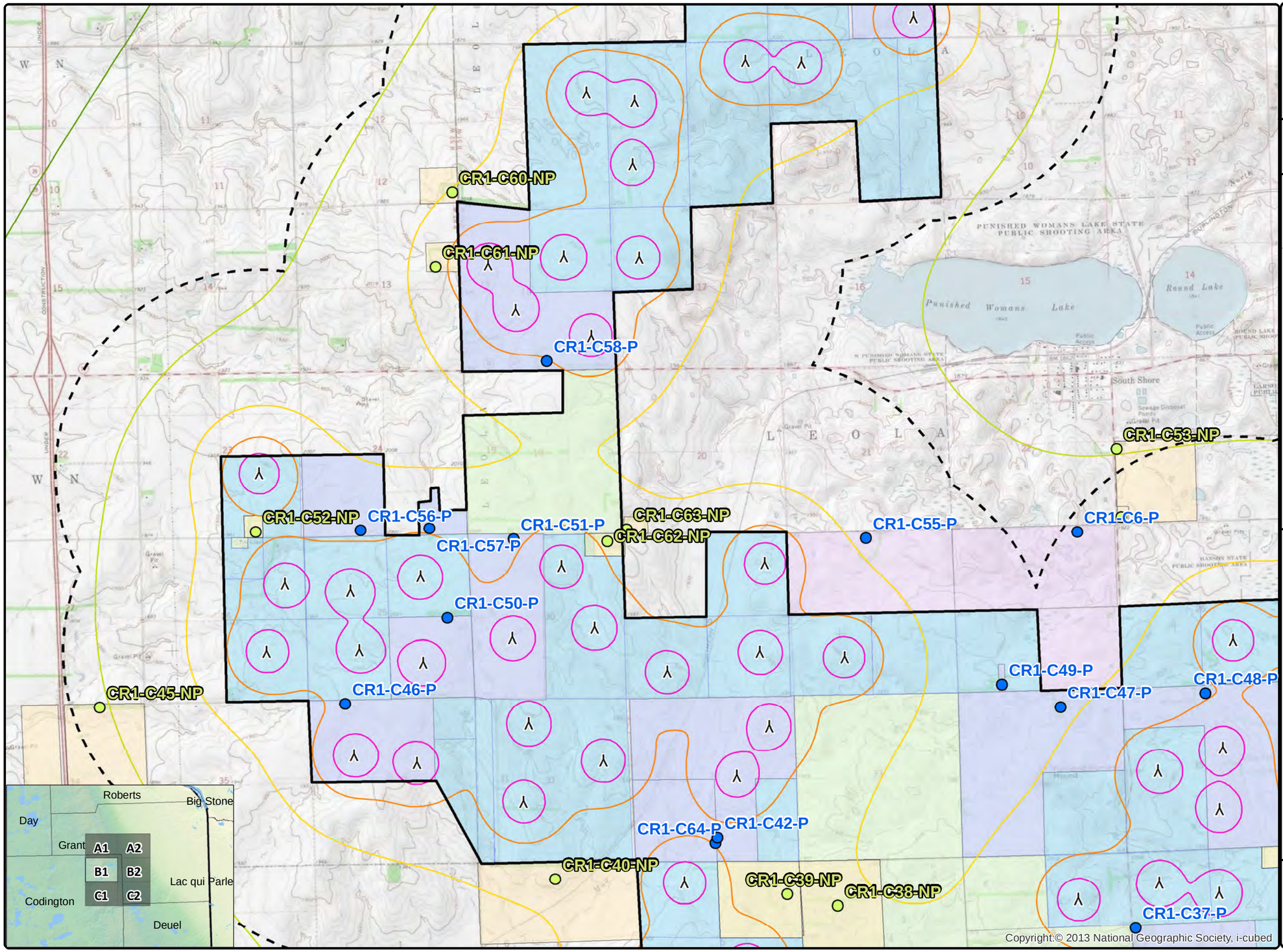

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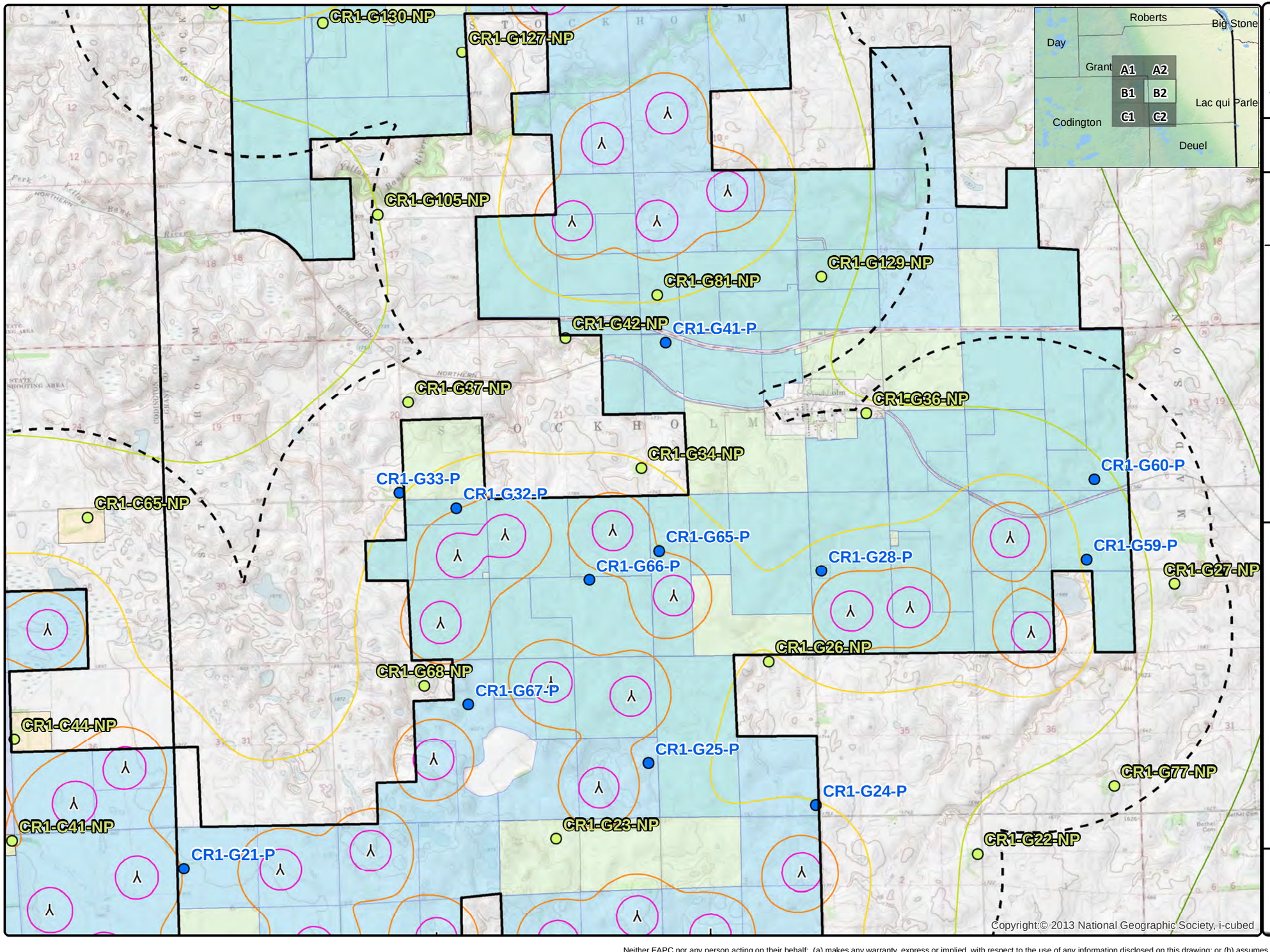

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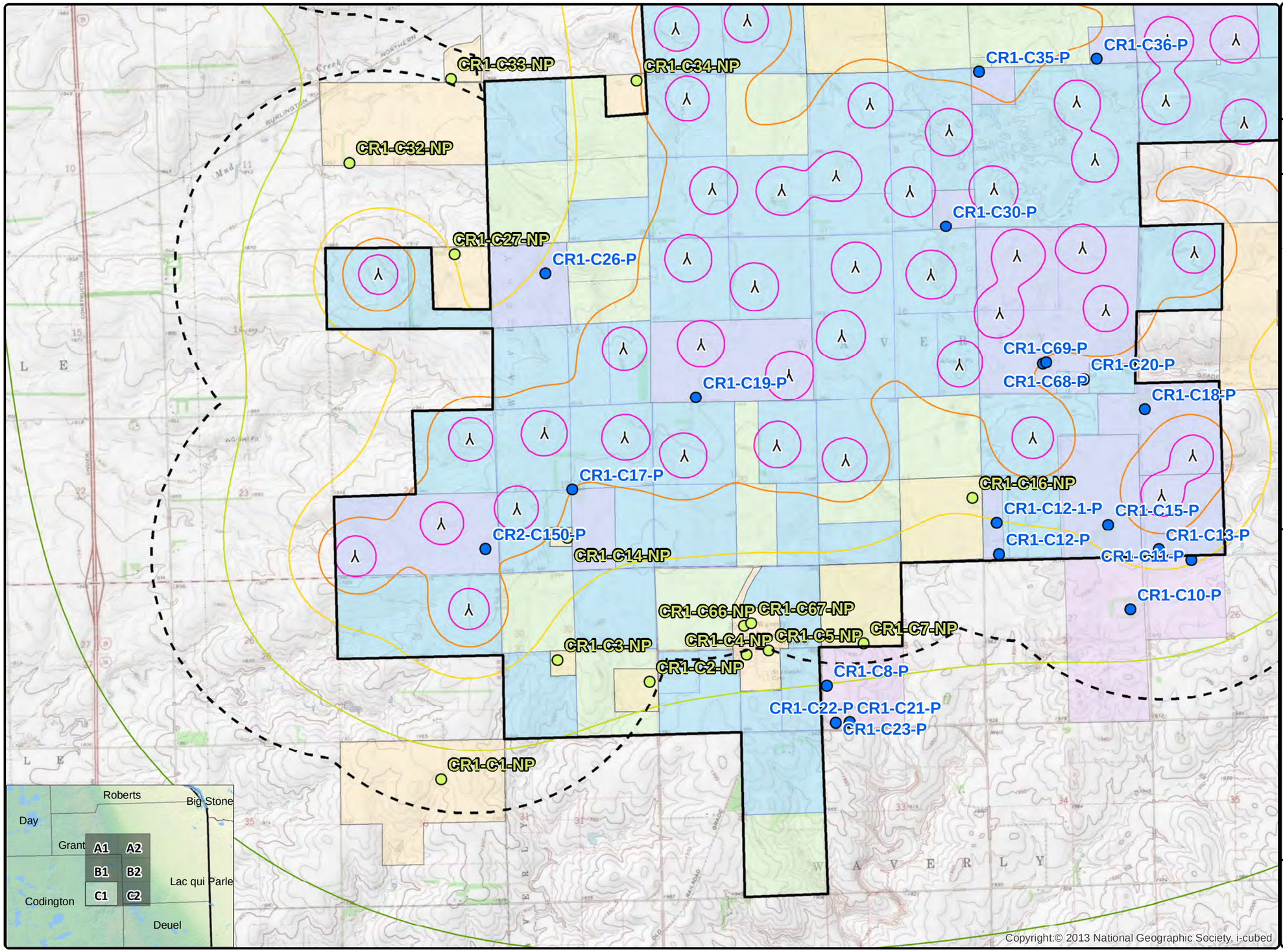

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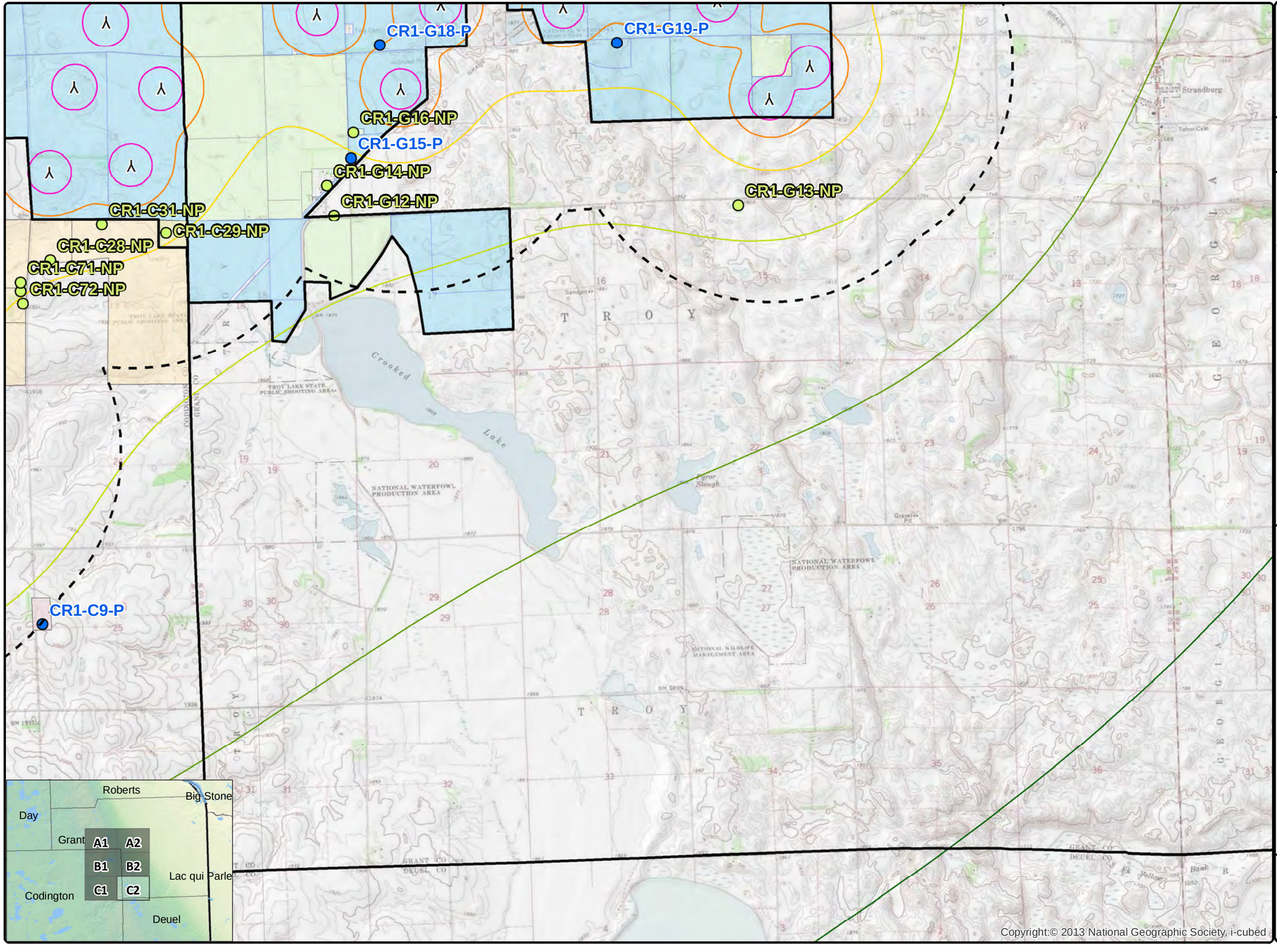

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