

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE APPLICATION OF
CROWNED RIDGE, LLC FOR A FACILITIES PERMIT TO
CONSTRUCTION 300 MEGAWATT WIND FACILITY**

Docket No. EL19-003

**SUPPLEMENT TESTIMONY AND EXHIBITS
OF JAY HALEY**

April 3, 2019

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Jay Haley. My business address is 3100 DeMers Ave., Grand Forks, ND, 58201.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am a Partner in EAPC Wind Energy and work as a Wind Engineer.

Q. WHAT ARE YOUR RESPONSIBILITIES?

A. My responsibility was to conduct the sound and shadow/flicker studies for Crowned Ridge Wind, LLC ("CRW").

Q. ARE YOU THE SAME JAY HALEY WHO SUBMITTED DIRECT TESTIMONY IN THIS PROCEEDING ON JANUARY 30, 2019?

A. Yes.

Q. HAS THIS TESTIMONY BEEN PREPARED BY YOU OR UNDER YOUR DIRECT SUPERVISION?

A. Yes.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY.

A. The purpose of my supplemental testimony is to update the sound and shadow/flicker studies based on updated participant information and to address comments made at the March 20, 2019 public input hearing on the sound and shadow/flicker studies.

SOUND STUDY

Q. PLEASE ADDRESS ANY UPDATES TO THE SOUND STUDY SINCE IT WAS FILED ON JANUARY 30, 2019.

A. The Sound Study has been updated to reflect the up-to-date participating landowner information. Exhibit 1 to this testimony provides supplemental material that updates the Sounds Study to reflect the number of participating landowners. For clarity, I also updated tables C-1 and C-2 of the Sound Study (Exhibit 2), and below I reproduced the revised summary tables 2 and 3 from the Study:

Table 1: 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	12	2
45 to 50	14	11
50+	0	17

Table 2: 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	4	0
35 to 40	12	11
40 to 45	10	18
45 to 50	0	3
+50	0	0

Q. AT THE PUBLIC INPUT HEARING THERE WERE COMMENTS ON THE LEVEL OF SOUND PARTICIPANTS AND NON-PARTICIPANTS WOULD EXPERIENCE. PLEASE EXPLAIN WHETHER YOUR STUDY USED CONSERVATIVE ASSUMPTIONS?

A. Yes, the Sound Study used the following conservative assumptions:

1. Turbines are always operating at maximum sound emission levels.
2. An additional 2 dBA was added to the turbine sound emission levels.
3. All turbines were modeled as if they were always downwind of each receptor.
4. The atmospheric conditions modeled were most favorable for sound transmission.
5. The receptors in Grant County were modeled 50 feet from the perimeter where the ordinance specifies 25 feet.

In addition, all occupied non-participating structures in both Codington and Grant Counties are below 45 dBA (which is not a requirement in Codington County). All occupied participating structures are below 50 dBA for both Codington and Grant Counties (also not a requirement in Codington County).

Q. SINCE YOUR STUDY USED CONSERVATIVE ASSUMPTIONS, EXPLAIN HOW THE USE OF THOSE ASSUMPTIONS IMPACT THE SOUND LEVEL THAT WILL BE EXPERIENCED?

A. Given that the Sound Study issued conservative assumptions, the actual sound that will be experienced from the turbines will likely be less than as modeled. Since the turbines will not always be operating at maximum power, will not always be downwind of the receptors, and atmospheric conditions will not always be optimum for sound transmission, the sound levels will likely be less than as modeled.

Q. DID YOU ANALYZE THE CUMULATIVE EFFECTS OF SOUND IN THE CONTEXT OF NEARBY WIND PROJECTS?

A. Yes, I considered the cumulative effects from the yet to be filed Crowned Ridge Wind II project and the nearby Dakota Range wind project. All wind turbines from both the Crowned Ridge II and Dakota Range wind farms were included in my analysis so any contributions from those turbines at the receptors in the CRW project are represented in the results of the Sound Study. My prior conclusions were not changed as a result of these impacts.

SHADOW/FLICKER STUDY

Q. PLEASE ADDRESS ANY UPDATES TO THE SHADOW/FLICKER STUDY SINCE IT WAS FILED ON JANUARY 30, 2019.

A. The Shadow/Flicker Study has been updated to reflect the participating landowner information. Exhibit 3 provides supplemental material that updates the Shadow/Flicker Study to reflect the number of participating landowners. For clarity, I also updated tables C-1 and C-2 of the Shadow Flicker Study (Exhibit 4) and below I reproduced the revised summary tables 2 and 3 from the Study:

Table 3: Codington County occupied structures realistic shadow/flicker distribution.

Realistic Shadow Flicker (hrs/year)	Number of Non-Participating Occupied Structures	Number of Participating Occupied Structures
0	12	1
0 to 5	4	3
5 to 10	11	6
10 to 15	5	6
15 to 20	2	6
20 to 25	2	6
25 to 30	2	6
30+	1	1

Table 4: Grant County occupied structures realistic shadow/flicker distribution.

Realistic Shadow Flicker (hrs/year)	Number of Non-Participating Occupied Structures	Number of Participating Occupied Structures
0	12	6
0 to 5	6	6
5 to 10	4	5
10 to 15	2	5
15 to 20	1	5
20 to 25	1	2
25 to 30	0	3
30+	0	0

Q. AT THE PUBLIC INPUT HEARING THERE WERE COMMENTS ON THE LEVEL OF SHADOW FLICKER PARTICIPANTS AND NON-PARTICIPANTS WOULD EXPERIENCE. PLEASE EXPLAIN WHETHER YOUR STUDY USED CONSERVATIVE ASSUMPTIONS?

A. Yes, the study used the following conservative assumptions:

1. The receptors were omni-directional (windows all around).
2. No credit was taken for the blockage of shadow/flicker by trees or buildings.
3. The study assumes 100% turbine availability.
4. The study assumes all turbine locations, including 20 alternates.

1 **Q. DID YOU ANALYZE THE CUMULATIVE EFFECTS OF SHADOW FLICKER**
2 **STUDY IN THE CONTEXT OF NEARBY WIND PROJECTS?**

3
4 A. Yes, I considered the cumulative effects from the yet to be filed Crowned Ridge Wind II
5 project and the Dakota Range wind project. My conclusions were not altered as a result of
6 these impacts, with the exception of two receptors. Receptor CR1-C106-P shows a total of
7 50 hours and 20 minutes of shadow flicker hours per year. This receptor was not included
8 in the original study because our records indicate that it is an abandoned building. It was
9 included because of the Intervenor's input that it was an occupied residence. The other
10 receptor, CR1-C61-NP shows a total of 49 hours and six minutes of shadow flicker hours
11 per year. This receptor would experience 27 hours and 42 minutes of shadow flicker from
12 Crowned Ridge wind turbines. An additional 21 hours and 33 minutes of shadow flicker
13 hours are contributed by Dakota Range wind turbines.

14
15 **Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL TESTIMONY?**

16 A. Yes, it does.

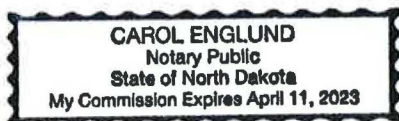
STATE OF NORTH DAKOTA)
) ss
COUNTY OF GRAND FORKS)

I, Jay Haley, being duly sworn on oath, depose and state that I am the witness identified in the foregoing prepared testimony and I am familiar with its contents, and that the facts set forth are true to the best of my knowledge, information and belief.


Jay Haley

Subscribed and sworn to before me this 3rd day of April, 2019.

SEAL




Notary Public

My Commission Expires April 11, 2023



February 19, 2019

Tyler Wilhelm
Project Manager
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, FL 33408
Office: (561) 694-3193
Tyler.Wilhelm@nee.com

Subject: Crowned Ridge additional structures

Dear Mr. Wilhelm,

This letter is intended to provide updated landowner participation status information that was not included in the original report titled: "Final Report, Crowned Ridge Wind Farm Sound Study, Codington and Grant Counties, SD", dated February 6, 2019, submitted by EAPC Wind Energy.

After the report was submitted, I was made aware of updated land parcel and farmstead status databases. There were a number of changes in landowner participation status from the original report. Most were changed from non-participating to participating, with a few that changed from participating to non-participating.

There were no changes in compliance with Codington or Grant County requirements for noise limits.

I have attached updated maps and results tables that reflect the changes in participation status for the noise receptors.

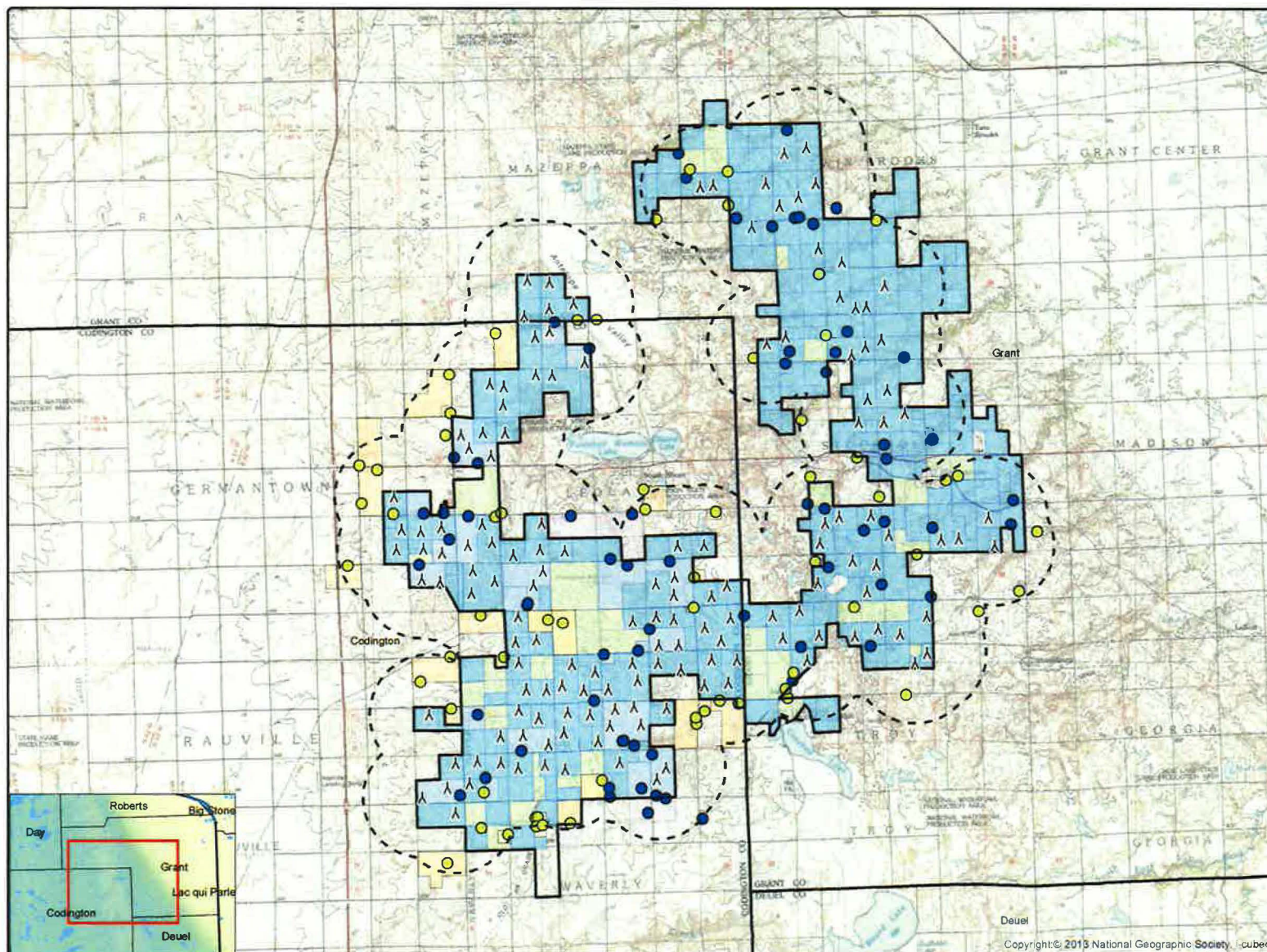
Sincerely,

Jay Haley, P.E., Partner
For EAPC Wind Energy

Attachments:

- Appendix A – Crowned Ridge Energy Project Site Overview Map
- Appendix B – Wind Turbine Coordinates
- Appendix C – Table of Sound Results
- Appendix D – Standard Resolution Sound Maps

APPENDIX A: CROWNED RIDGE WIND ENERGY PROJECT SITE OVERVIEW MAP



www.eapc.net | 701.775.2000

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 structures.

Codington County land parcels within 2 km of a wind turbine.

Location: Watertown, SD

Project #: 20174431

Issue Dates

#	Description	Date
1	Original	2019.02.15
2	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

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0 0.75 1.5 3 Mile



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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

[illegible]



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	36.5	4,258
CR1-C2-NP	Non-P	Boundary	658,435	4,984,609	601.8	37.7	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	38.5	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	1,670
CR1-C13-P	Participant	Boundary	664,410	4,986,207	615.0	53.3	574
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	722
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	591
CR1-C19-P	Participant	Boundary	660,393	4,987,529	607.7	50.1	784
CR1-C20-P	Participant	Boundary	662,024	4,987,612	604.8	51.0	640
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	42.2	1,749
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	633
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	38.2	4,970
CR1-C33-NP	Non-P	Boundary	657,126	4,990,843	567.0	38.1	5,856
CR1-C34-NP	Non-P	Boundary	658,763	4,990,247	589.7	45.9	1,293
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	48.3	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	1,824
CR1-C45-NP	Non-P	Boundary	653,821	4,993,552	572.0	37.0	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	410
CR1-C49-P	Participant	Boundary	662,224	4,993,664	609.0	38.5	5,105
CR1-C50-P	Participant	Boundary	656,239	4,994,042	618.0	49.7	984
CR1-C51-P	Participant	Boundary	657,753	4,994,889	620.0	51.5	564
CR1-C52-NP	Non-P	Boundary	654,986	4,995,398	603.0	45.8	1,335
CR1-C53-NP	Non-P	Boundary	664,171	4,995,340	580.6	37.4	4,009
CR1-C54-NP	Non-P	Boundary	663,495	4,995,329	582.9	36.7	5,075
CR1-C55-P	Participant	Boundary	660,139	4,994,937	606.2	49.4	722
CR1-C56-P	Participant	Boundary	655,621	4,995,989	606.2	49.4	627
CR1-C57-P	Participant	Boundary	656,526	4,995,198	616.1	45.9	1,319
CR1-C58-P	Participant	Boundary	657,619	4,997,581	611.9	50.6	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	42.9	2,218
CR1-C61-NP	Non-P	Boundary	656,927	4,997,826	612.0	48.2	912
CR1-C62-NP	Non-P	Boundary	658,155	4,994,994	614.7	48.7	820
CR1-C63-NP	Non-P	Boundary	658,543	4,995,211	606.8	42.5	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	39.2	2,825
CR1-C70-NP	Non-P	Boundary	664,953	4,987,981	596.1	42.7	3,225
CR1-C71-NP	Non-P	Boundary	664,658	4,987,355	600.0	48.6	1,050
CR1-C105-NP	Non-P	Boundary	658,351	5,000,265	609.0	49.8	604
CR1-C106-P	Participant	Boundary	659,931	5,001,205	605.4	51.0	768
CR1-C107-NP	Non-P	Boundary	655,923	4,998,435	595.8	48.5	673
CR1-C109-NP	Non-P	Boundary	654,533	4,997,357	592.6	41.0	1,909
CR1-C110-NP	Non-P	Boundary	654,553	4,996,633	588.7	41.4	2,365
CR1-C111-NP	Non-P	Boundary	654,576	4,995,809	599.1	45.6	1,240
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	5,541
CR1-C2-NP	Non-P	Structure	658,791	4,984,483	601.6	37.4	6,273
CR1-C3-NP	Non-P	Structure	657,888	4,984,697	604.2	38.8	3,294
CR1-C4-NP	Non-P	Structure	659,744	4,984,749	605.9	38.5	5,981
CR1-C5-NP	Non-P	Structure	659,958	4,984,794	605.2	38.9	5,659
CR1-C6-P	Participant	Structure	662,989	4,995,228	599.8	36.5	6,102
CR1-C7-NP	Non-P	Structure	660,893	4,984,861	593.2	41.3	3,022
CR1-C8-P	Participant	Structure	660,532	4,984,445	599.7	40.1	3,740
CR1-C9-P	Participant	Structure	665,352	4,985,004	609.0	47.7	1,621
CR1-C10-P	Participant	Structure	663,510	4,985,195	609.0	47.0	1,762

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-C11-P	Participant	Structure	664,111	4,985,679	609.0	47.9	1,614
CR1-C12-P	Participant	Structure	662,222	4,985,736	603.0	44.3	2,201
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	1,739
CR1-C14-NP	Non-P	Structure	657,982	4,985,894	609.0	43.4	1,880
CR1-C15-P	Participant	Structure	663,291	4,986,026	615.0	46.1	1,952
CR1-C16-NP	Non-P	Structure	661,960	4,986,288	606.0	43.3	2,736
CR1-C17-P	Participant	Structure	658,031	4,986,373	609.1	45.1	1,886
CR1-C18-P	Participant	Structure	663,651	4,987,157	610.5	44.8	2,146
CR1-C19-P	Participant	Structure	659,243	4,987,276	611.5	46.4	1,722
CR1-C20-P	Participant	Structure	663,054	4,987,455	606.0	44.5	2,336
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	3,484
CR1-C27-NP	Non-P	Structure	656,876	4,988,683	583.0	40.0	2,549
CR1-C28-NP	Non-P	Structure	665,429	4,988,598	590.8	42.1	2,831
CR1-C29-NP	Non-P	Structure	666,572	4,988,867	575.9	41.4	2,457
CR1-C30-P	Participant	Structure	661,699	4,988,957	615.0	47.9	1,614
CR1-C31-NP	Non-P	Structure	665,939	4,988,950	585.4	43.4	2,126
CR1-C32-NP	Non-P	Structure	655,843	4,989,581	568.6	37.1	3,714
CR1-C33-NP	Non-P	Structure	656,839	4,990,404	569.8	37.4	6,719
CR1-C34-NP	Non-P	Structure	658,661	4,990,389	589.1	44.5	1,726
CR1-C35-P	Participant	Structure	662,025	4,990,475	609.0	43.9	2,123
CR1-C36-P	Participant	Structure	663,181	4,990,600	615.0	46.2	1,532
CR1-C37-P	Participant	Structure	663,563	4,991,342	605.1	46.5	1,631
CR1-C38-NP	Non-P	Structure	660,639	4,991,557	597.0	41.0	3,474
CR1-C39-NP	Non-P	Structure	660,144	4,991,670	588.0	42.3	2,605
CR1-C40-NP	Non-P	Structure	657,865	4,991,818	583.8	41.5	2,690
CR1-C41-NP	Non-P	Structure	665,053	4,992,084	576.1	45.0	2,359
CR1-C42-P	Participant	Structure	659,458	4,992,229	580.0	44.6	1,801
CR1-C44-NP	Non-P	Structure	665,076	4,993,095	578.2	44.0	2,155
CR1-C45-NP	Non-P	Structure	653,390	4,993,503	573.0	35.4	5,673
CR1-C46-P	Participant	Structure	655,802	4,993,540	609.7	46.0	1,680
CR1-C47-P	Participant	Structure	662,825	4,993,508	613.8	39.5	3,750
CR1-C48-P	Participant	Structure	664,247	4,993,646	588.0	44.7	1,847
CR1-C49-P	Participant	Structure	662,250	4,993,731	609.0	38.4	5,148
CR1-C50-P	Participant	Structure	656,806	4,994,388	621.0	46.8	1,591

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Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID
Realistic case sound results at occupied 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	38.8	3,940
CR1-G15-P	Participant	Structure	668,396	4,989,607	576.0	40.1	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	42.6	2,185
CR1-G24-P	Participant	Structure	673,058	4,992,440	539.4	40.6	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	34.0	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	35.5	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	38.1	3,819
CR1-G43-NP	Non-P	Structure	661,141	5,001,721	584.2	43.0	1,909
CR1-G44-NP	Non-P	Structure	661,781	5,001,732	583.7	39.2	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	36.4	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-G81-P	Participant	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	35.3	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	40.1	2,152
CR1-G110-NP	Non-P	Structure	671,218	5,005,064	456.4	34.8	5,889
CR1-G113-NP	Non-P	Structure	666,228	5,005,549	537.0	40.3	2,746
CR1-G114-NP	Non-P	Structure	666,214	5,006,667	520.8	40.8	2,205

continued

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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
Codrington County

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-C48-P	Participant	Boundary	664,262	4,992,514	586.8	53.6	410
CR1-C13-P	Participant	Boundary	664,410	4,986,207	615.0	53.3	574
CR1-C18-P	Participant	Boundary	664,126	4,986,525	610.2	52.4	591
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-C51-P	Participant	Boundary	657,753	4,994,889	620.0	51.5	564
CR1-C46-P	Participant	Boundary	656,678	4,992,970	611.5	51.4	561
CR1-C30-P	Participant	Boundary	661,978	4,989,318	613.3	51.3	633
CR2-C150-P	Participant	Boundary	657,308	4,986,173	600.0	51.3	591
CR1-C15-P	Participant	Boundary	663,047	4,985,700	612.8	51.1	722
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	640
CR1-C106-P	Participant	Boundary	659,931	5,001,205	605.4	51.0	768
CR1-C58-P	Participant	Boundary	657,619	4,997,581	611.9	50.6	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	784
CR1-C64-P	Participant	Boundary	659,129	4,991,995	576.5	49.9	679
CR1-C105-NP	Non-P	Boundary	658,351	5,000,265	609.0	49.8	604
CR1-C50-P	Participant	Boundary	656,239	4,994,042	618.0	49.7	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-C56-P	Participant	Boundary	655,621	4,995,989	606.2	49.4	627
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	48.7	820
CR1-C71-NP	Non-P	Boundary	664,658	4,987,355	600.0	48.6	1,050
CR1-C39-NP	Non-P	Boundary	659,741	4,991,242	583.2	48.5	856
CR1-C107-NP	Non-P	Boundary	655,923	4,998,435	595.8	48.5	673
CR1-C36-P	Participant	Boundary	663,564	4,990,731	610.7	48.3	1,033
CR1-C61-NP	Non-P	Boundary	656,927	4,997,826	612.0	48.2	912
CR1-C38-NP	Non-P	Boundary	660,955	4,990,468	591.2	47.3	1,027
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-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	45.9	1,293
CR1-C57-P	Participant	Boundary	656,526	4,995,198	616.1	45.9	1,319
CR1-C52-NP	Non-P	Boundary	654,986	4,995,398	603.0	45.8	1,335

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-C111-NP	Non-P	Boundary	654,576	4,995,809	599.1	45.6	1,240
CR1-C12-P	Participant	Boundary	662,067	4,985,677	604.9	45.3	1,670
CR1-C17-P	Participant	Boundary	658,017	4,986,369	606.4	45.2	1,837
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	1,824
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-C60-NP	Non-P	Boundary	656,909	4,998,465	609.3	42.9	2,218
CR1-C70-NP	Non-P	Boundary	664,953	4,987,981	596.1	42.7	3,225
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	42.5	2,277
CR1-C27-NP	Non-P	Boundary	656,658	4,988,484	587.2	42.2	1,749
CR1-C110-NP	Non-P	Boundary	654,553	4,996,633	588.7	41.4	2,365
CR1-C109-NP	Non-P	Boundary	654,533	4,997,357	592.6	41.0	1,909
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	39.2	2,825
CR1-C49-P	Participant	Boundary	662,224	4,993,664	609.0	38.5	5,105
CR1-C6-P	Participant	Boundary	663,383	4,994,502	591.0	38.5	3,878
CR1-C32-NP	Non-P	Boundary	657,187	4,989,566	573.0	38.2	4,970
CR1-C33-NP	Non-P	Boundary	657,126	4,990,843	567.0	38.1	5,856
CR1-C2-NP	Non-P	Boundary	658,435	4,984,609	601.8	37.7	5,036
CR1-C53-NP	Non-P	Boundary	664,171	4,995,340	580.6	37.4	4,009
CR1-C45-NP	Non-P	Boundary	653,821	4,993,552	572.0	37.0	4,291
CR1-C54-NP	Non-P	Boundary	663,495	4,995,329	582.9	36.7	5,075
CR1-C1-NP	Non-P	Boundary	657,276	4,983,921	590.3	36.5	4,258
CR1-C11-P	Participant	Structure	664,111	4,985,679	609.0	47.9	1,614
CR1-C30-P	Participant	Structure	661,699	4,988,957	615.0	47.9	1,614
CR1-C9-P	Participant	Structure	665,352	4,985,004	609.0	47.7	1,621
CR1-C106-P	Participant	Structure	660,365	5,001,639	605.0	47.3	1,165
CR1-C10-P	Participant	Structure	663,510	4,985,195	609.0	47.0	1,762
CR1-C13-P	Participant	Structure	663,792	4,985,785	612.0	46.9	1,739
CR1-C50-P	Participant	Structure	656,806	4,994,388	621.0	46.8	1,591
CR1-C37-P	Participant	Structure	663,563	4,991,342	605.1	46.5	1,631
CR1-C19-P	Participant	Structure	659,243	4,987,276	611.5	46.4	1,722
CR1-C36-P	Participant	Structure	663,181	4,990,600	615.0	46.2	1,532

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	Structure	663,291	4,986,026	615.0	46.1	1,952
CR2-C150-P	Participant	Structure	657,178	4,985,788	612.0	46.1	1,640
CR1-C46-P	Participant	Structure	655,802	4,993,540	609.7	46.0	1,680
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	1,886
CR1-C58-P	Participant	Structure	657,781	4,996,906	615.0	45.1	1,647
CR1-C41-NP	Non-P	Structure	665,053	4,992,084	576.1	45.0	2,359
CR1-C64-P	Participant	Structure	659,436	4,992,174	581.0	44.9	1,614
CR1-C57-P	Participant	Structure	656,628	4,995,266	615.0	44.9	1,568
CR1-C18-P	Participant	Structure	663,651	4,987,157	610.5	44.8	2,146
CR1-C56-P	Participant	Structure	655,953	4,995,244	606.0	44.8	1,972
CR1-C48-P	Participant	Structure	664,247	4,993,646	588.0	44.7	1,847
CR1-C52-NP	Non-P	Structure	654,924	4,995,231	603.0	44.7	1,883
CR1-C61-NP	Non-P	Structure	656,690	4,997,831	612.0	44.7	1,686
CR1-C42-P	Participant	Structure	659,458	4,992,229	580.0	44.6	1,801
CR1-C20-P	Participant	Structure	663,054	4,987,455	606.0	44.5	2,336
CR1-C34-NP	Non-P	Structure	658,661	4,990,389	589.1	44.5	1,726
CR1-C12-P	Participant	Structure	662,222	4,985,736	603.0	44.3	2,201
CR1-C51-P	Participant	Structure	657,455	4,995,160	621.0	44.1	1,768
CR1-C44-NP	Non-P	Structure	665,076	4,993,095	578.2	44.0	2,155
CR1-C62-NP	Non-P	Structure	658,375	4,995,138	615.0	44.0	1,676
CR1-C107-NP	Non-P	Structure	656,811	4,999,855	598.8	44.0	1,401
CR1-C35-P	Participant	Structure	662,025	4,990,475	609.0	43.9	2,123
CR1-C108-P	Participant	Structure	656,978	4,997,092	609.0	43.9	1,939
CR1-C12-1-P	Participant	Structure	662,199	4,986,047	606.0	43.6	2,818
CR1-C14-NP	Non-P	Structure	657,982	4,985,894	609.0	43.4	1,880
CR1-C31-NP	Non-P	Structure	665,939	4,988,950	585.4	43.4	2,126
CR1-C16-NP	Non-P	Structure	661,960	4,986,288	606.0	43.3	2,736
CR1-C59-P	Participant	Structure	661,548	5,000,754	584.1	42.7	1,644
CR1-C60-NP	Non-P	Structure	656,855	4,998,565	613.5	42.4	2,592
CR1-C39-NP	Non-P	Structure	660,144	4,991,670	588.0	42.3	2,605
CR1-C63-NP	Non-P	Structure	658,566	4,995,254	612.6	42.2	2,408
CR1-C105-NP	Non-P	Structure	658,372	5,001,257	601.5	42.2	2,549
CR1-C70-NP	Non-P	Structure	665,135	4,988,293	595.7	42.1	3,540
CR1-C72-NP	Non-P	Structure	665,158	4,988,170	595.2	42.1	3,776
CR1-C71-NP	Non-P	Structure	665,137	4,988,378	594.6	42.1	3,448
CR1-C28-NP	Non-P	Structure	665,429	4,988,598	590.8	42.1	2,831

[illegible]

Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level

Realistic case sound results at occupied 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

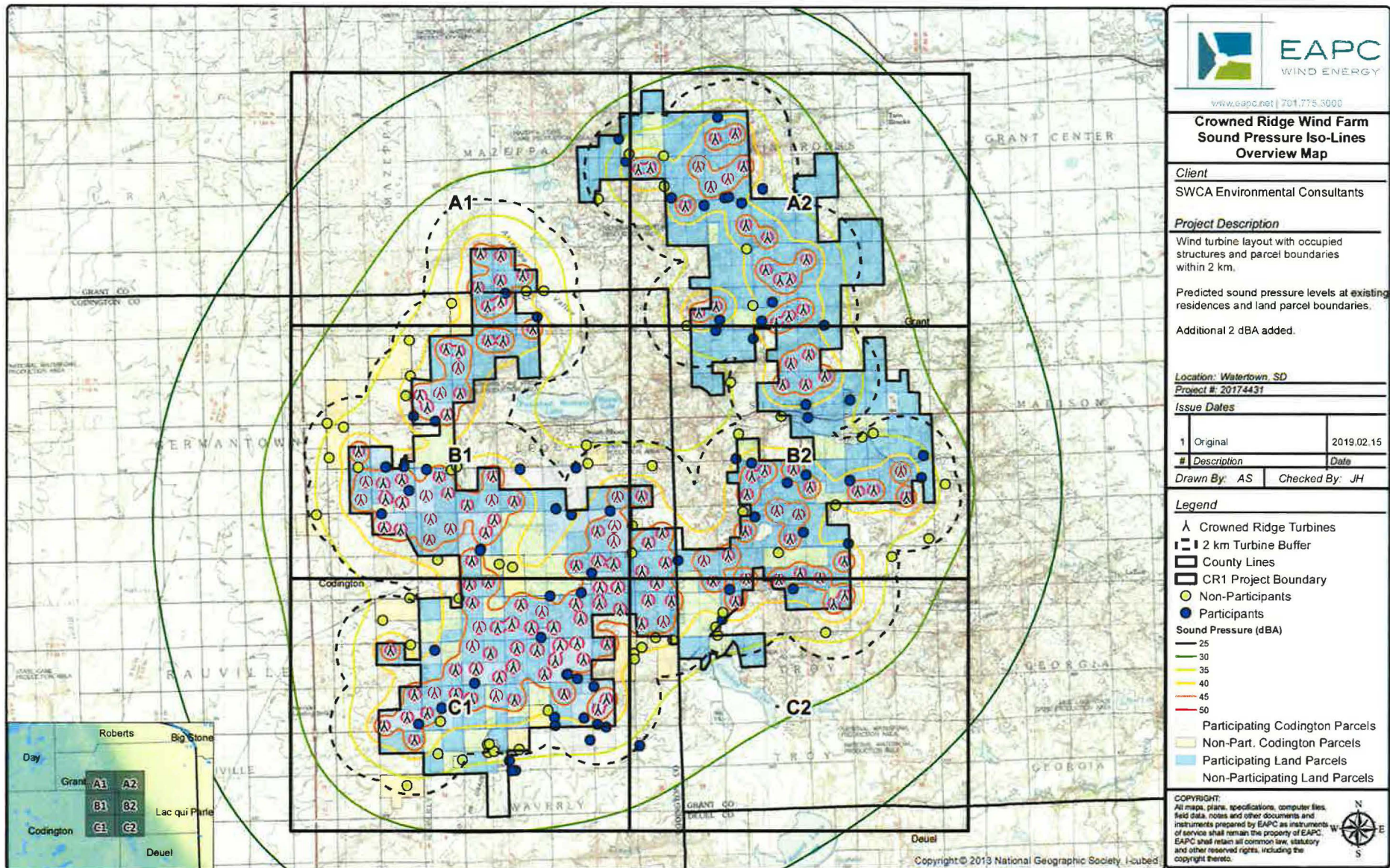
continued

Receptor ID	Participation Status	Type	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Sound (dB(A))	Distance to Nearest Turbine (ft)
CR1-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-G28-P	Participant	Structure	673,113	4,994,772	514.1	43.2	1,614
CR1-G67-P	Participant	Structure	669,597	4,993,440	555.8	43.2	2,106
CR1-G43-NP	Non-P	Structure	661,141	5,001,721	584.2	43.0	1,909
CR1-G68-NP	Non-P	Structure	669,159	4,993,632	564.7	43.0	2,113
CR1-G128-P	Participant	Structure	670,242	5,001,314	513.0	42.9	2,612
CR1-G131-P	Participant	Structure	668,466	5,005,145	505.1	42.9	2,133
CR1-G125-P	Participant	Structure	668,289	5,000,643	543.0	42.8	1,716
CR1-G124-P	Participant	Structure	669,843	5,000,605	525.0	42.7	1,791
CR1-G23-NP	Non-P	Structure	670,471	4,992,104	560.1	42.6	2,185
CR1-G135-P	Participant	Structure	668,616	5,005,161	504.2	42.6	2,142
CR1-G136-P	Participant	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-P	Participant	Structure	664,809	5,006,456	549.0	41.8	1,824
CR1-G137-P	Participant	Structure	666,501	5,005,136	529.5	41.6	1,939
CR1-G149-NP	Non-P	Structure	669,284	5,003,283	503.2	41.0	2,815
CR1-G34-NP	Non-P	Structure	671,320	4,995,798	531.0	40.8	2,238
CR1-G114-NP	Non-P	Structure	666,214	5,006,667	520.8	40.8	2,205
CR1-G81-P	Participant	Structure	671,478	4,997,523	508.7	40.7	2,421
CR1-G24-P	Participant	Structure	673,058	4,992,440	539.4	40.6	2,231
CR1-G132-P	Participant	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	40.5	2,188
CR1-G113-NP	Non-P	Structure	666,228	5,005,549	537.0	40.3	2,746
CR1-G15-P	Participant	Structure	668,396	4,989,607	576.0	40.1	2,746
CR1-G109-NP	Non-P	Structure	667,064	5,000,425	566.4	40.1	2,152
CR1-G33-P	Participant	Structure	668,911	4,995,550	548.7	39.9	2,779
CR1-G26-NP	Non-P	Structure	672,589	4,993,869	531.0	39.9	3,140
CR1-G139-P	Participant	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-G59-P	Participant	Structure	675,755	4,994,888	488.3	39.6	2,605
CR1-G126-P	Participant	Structure	672,157	5,000,446	484.3	39.4	3,176
CR1-G130-P	Participant	Structure	668,147	5,000,233	549.0	39.3	3,005

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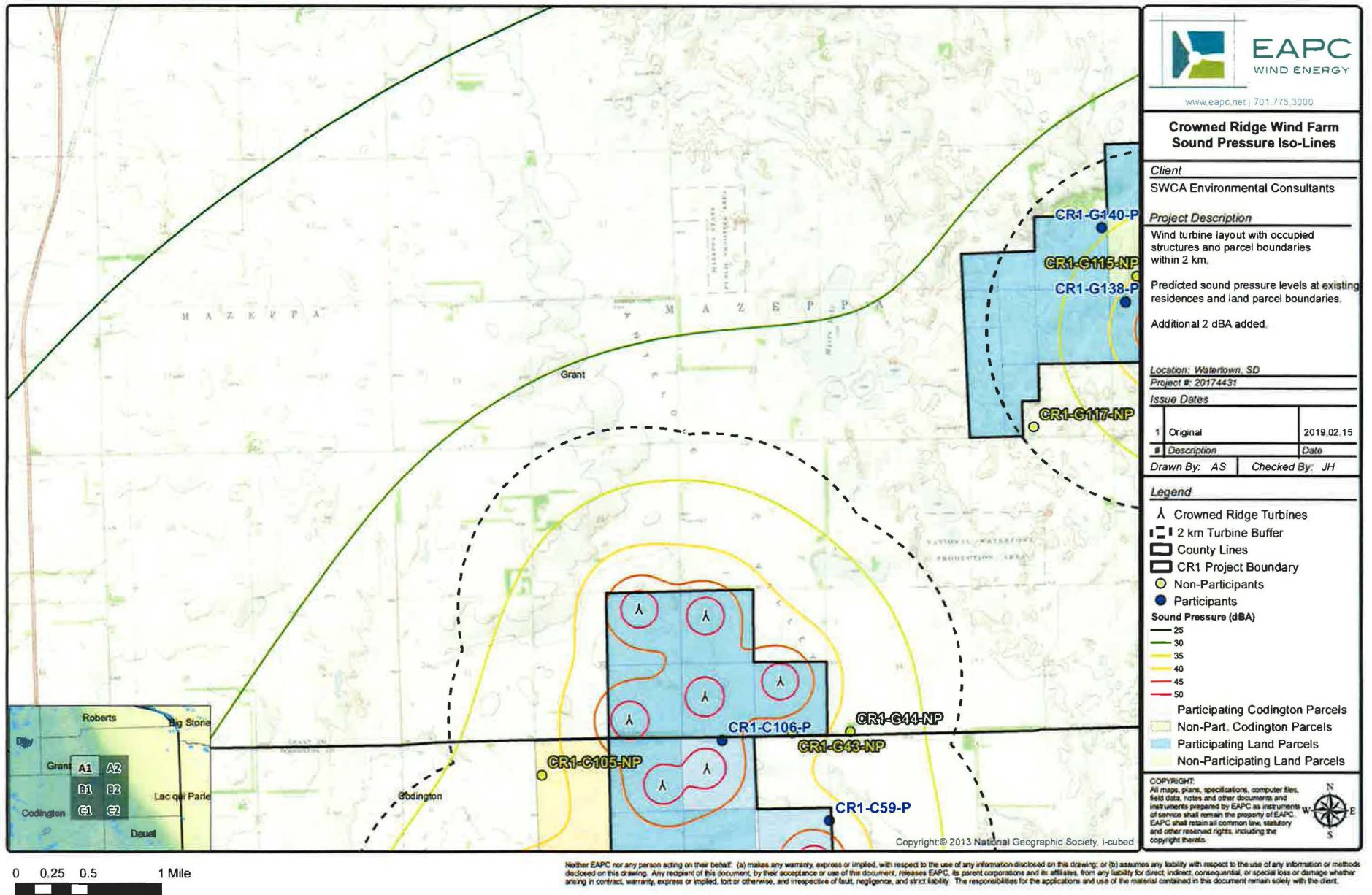
APPENDIX D: STANDARD RESOLUTION SOUND MAPS



0 0.75 1.5 3 Mile

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**Crowned Ridge Wind Farm
Sound Pressure Iso-Lines**

Client
SWCA Environmental Consultants

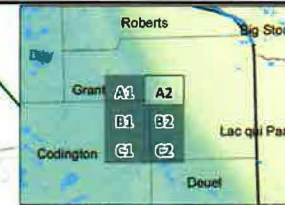
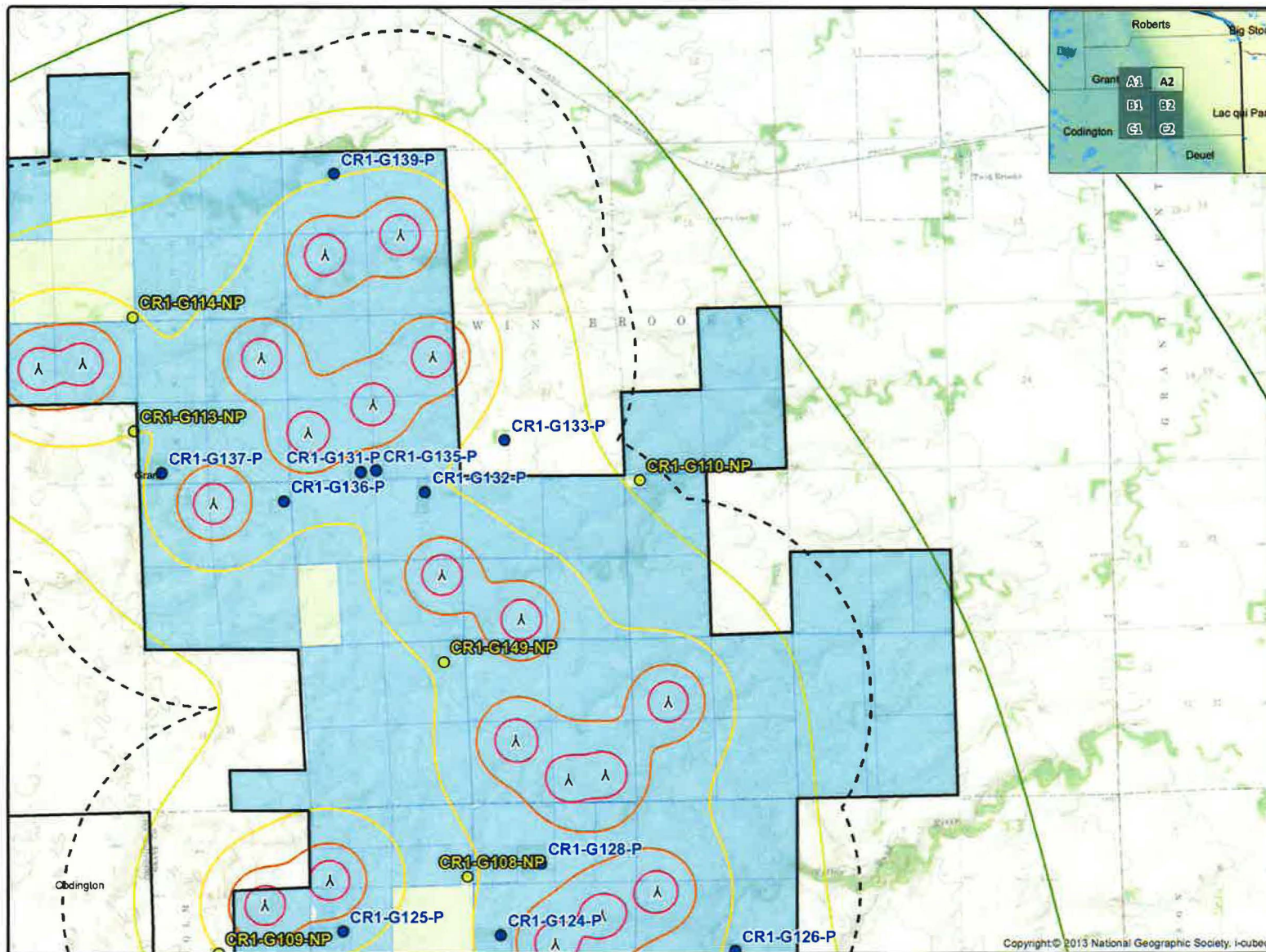
Project Description
Wind turbine layout with occupied structures and parcel boundaries within 2 km.
Predicted sound pressure levels at existing residences and land parcel boundaries.
Additional 2 dBA added.

Location: Watertown, SD	
Project #: 20174431	
Issue Dates	
1 Original	2019.02.15
# Description	Date
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

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Crowned Ridge Wind Farm Sound Pressure Iso-Lines

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.

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Project #: 20174431

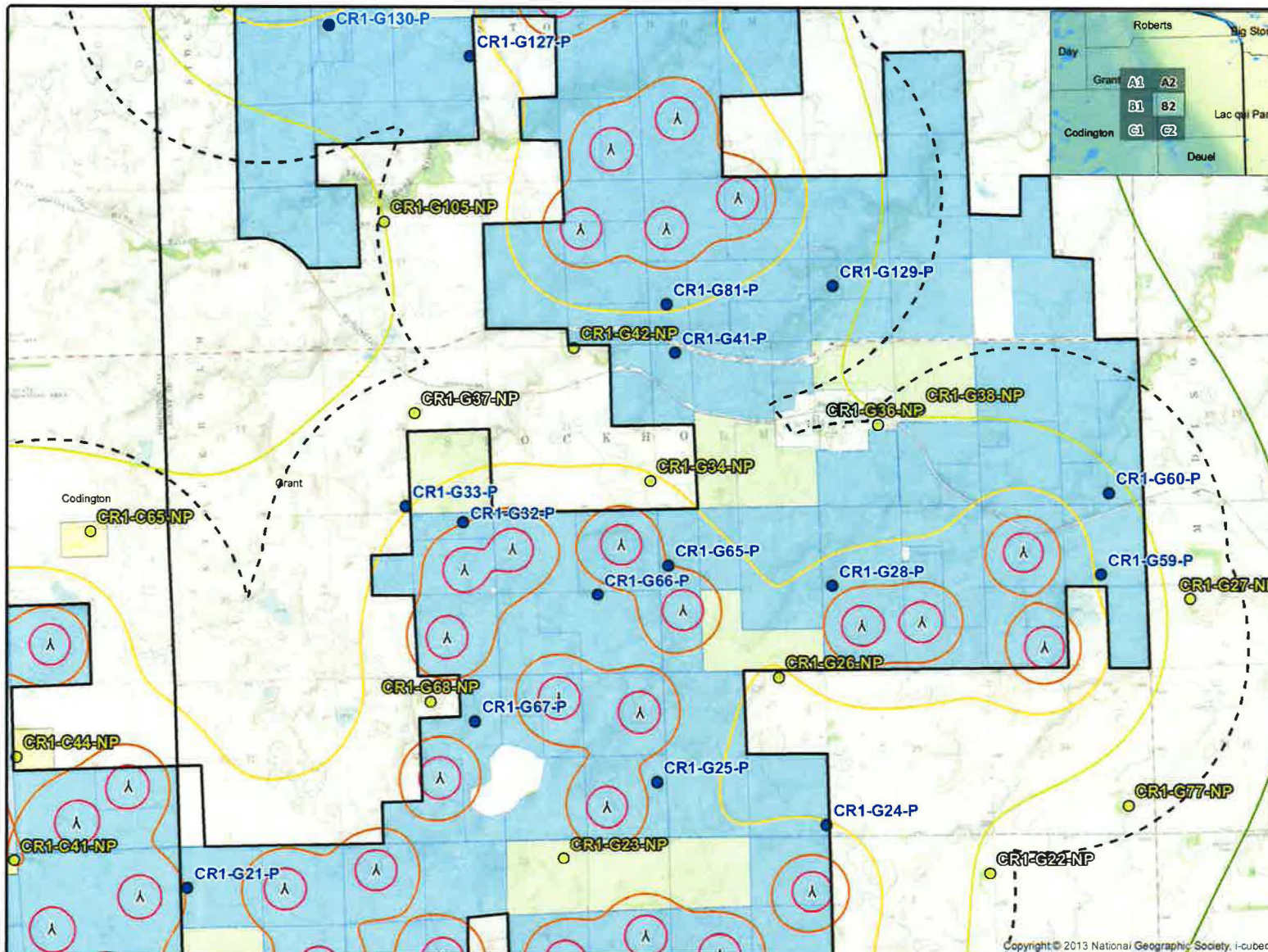
Issue Dates	
1 Original	2019.02.15
#	Description
1	Original
2	Revised
3	Revised
4	Revised
5	Revised
6	Revised
7	Revised
8	Revised
9	Revised
10	Revised
11	Revised
12	Revised
13	Revised
14	Revised
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95	Revised
96	Revised
97	Revised
98	Revised
99	Revised
100	Revised

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

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Crowned Ridge Wind Farm Sound Pressure Iso-Lines

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 #: 20174431

Issue Dates

#	Description	Date
1	Original	2019.02.15

Drawn By: AS Checked By: JH

Legend

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

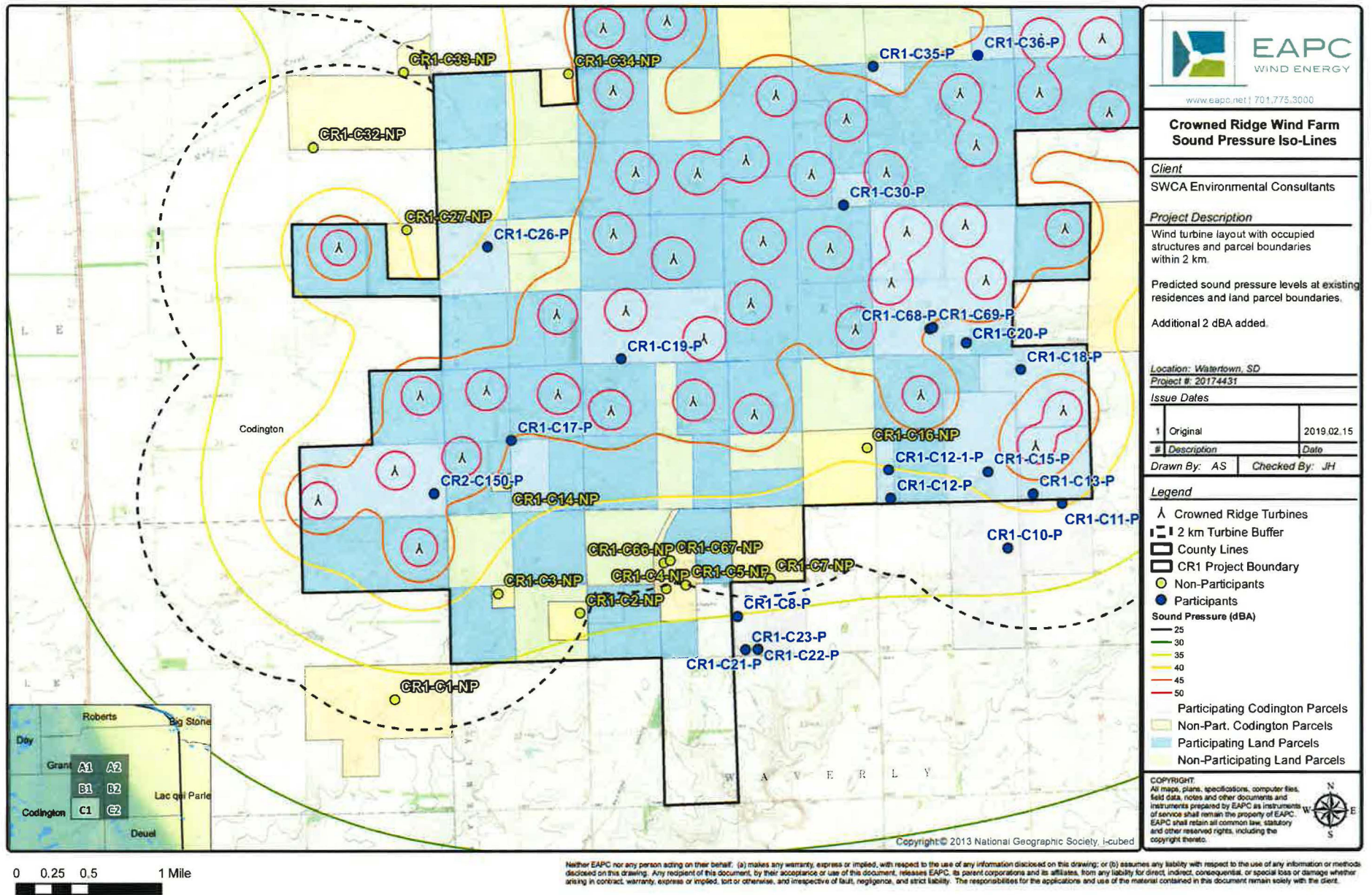
Sound Pressure (dBA)

- 25
- 30
- 35
- 40
- 45
- 50

Participating Codington Parcels
Non-Part. Codington Parcels
Participating Land Parcels
Non-Participating Land Parcels

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Crowned Ridge Wind Farm Sound Pressure Iso-Lines

Client

SWCA Environmental Consultants

Project Description

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

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Location: Watertown, SD

Project #: 20174431

Issue Dates

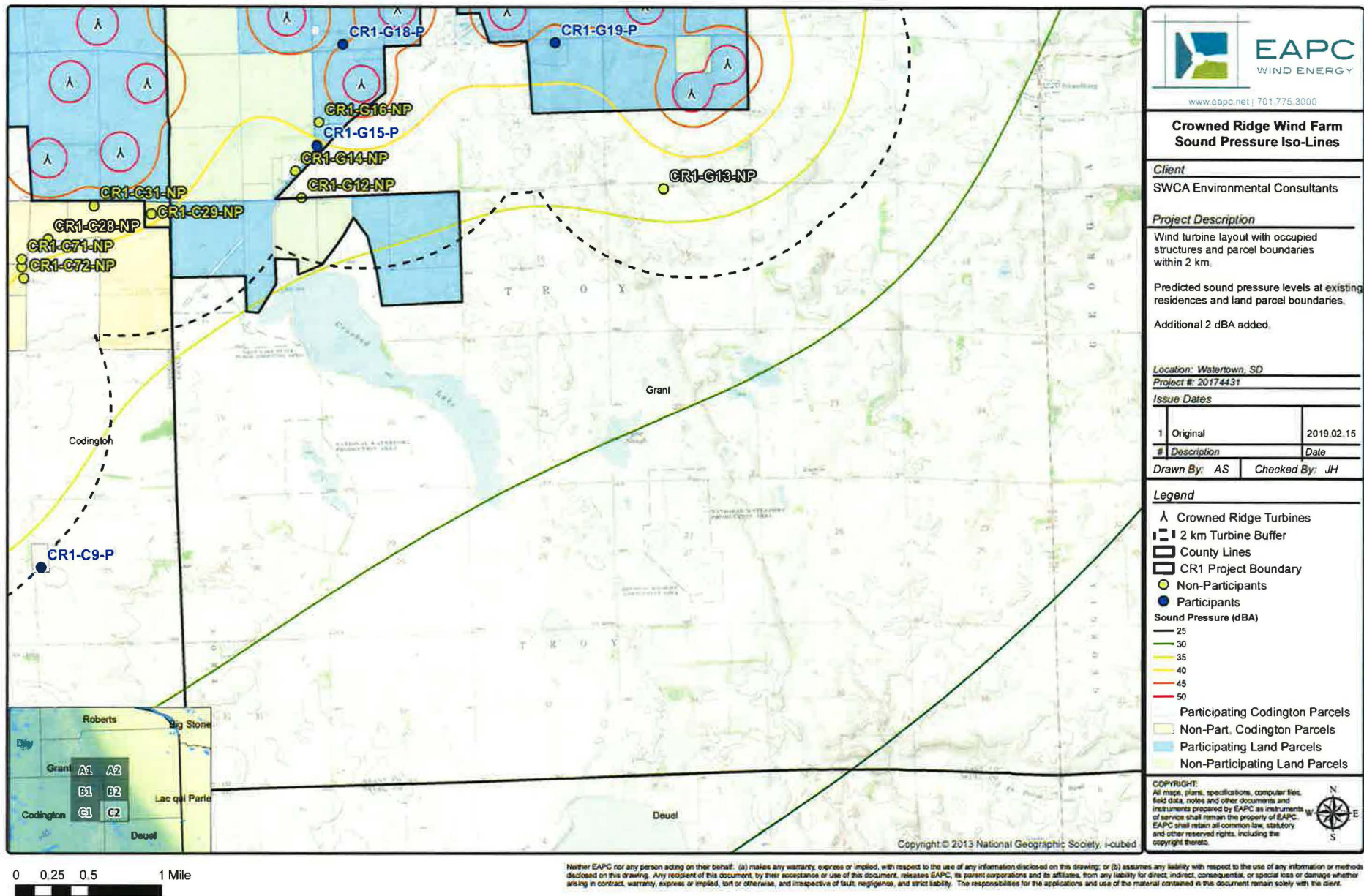
1	Original	2019.02.15
#	Description	Date
Drawn By:	AS	Checked By: JH

Legend

- ▲ Crowned Ridge Turbines
- 2 km Turbine Buffer
- County Lines
- CR1 Project Boundary
- Non-Participants
- Participants
- Sound Pressure (dBA)
 - 25
 - 30
 - 35
 - 40
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- Non-Part. Codington Parcels
- Participating Land Parcels
- Non-Participating Land Parcels

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February 26, 2019

Tyler Wilhelm
Project Manager
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, FL 33408
Office: (561) 694-3193
Tyler.Wilhelm@nee.com

Subject: Crowned Ridge participation status changes

Dear Mr. Wilhelm,

This letter is intended to provide updated landowner participation status information that was not included in the original report titled: "Final Report, Crowned Ridge Wind Farm Sound Study, Codington and Grant Counties, SD", dated February 6, 2019, submitted by EAPC Wind Energy.

After the report was submitted, I was made aware of updated land parcel and farmstead status databases. There were a number of changes in landowner participation status from the original report. Most were changed from non-participating to participating, with a few that changed from participating to non-participating.

The following receptors were changed from non-participating to participating.

Receptors with Participation Status Change			
Receptor	First Name	Last Name	Sound (dBA)
CR1-G81-P	Nelson E	Ransom	40.7
CR1-G125-P	Dalton H & Barbara J	Rude	42.8
CR1-G126-P	Marilyn R	Stemsrud	39.4
CR1-G127-P	Henry C & Betty Lou	Erickson	38.8
CR1-G128-P	Ronald & Mindy	Marko	42.9
CR1-G129-P	Dennis M & Deloris D	Redeen	36.3
CR1-G130-P	Dalton H & Barbara J	Rude	39.3
CR1-G131-P	Richard	Hansen	42.9
CR1-G132-P	Eric	Hansen	40.6
CR1-G133-P	Laverna	Moldenhauer	38.3
CR1-G135-P	Richard	Hansen	42.6
CR1-G136-P	Duane	Fish	42.2
CR1-G137-P	Richard	Fish	41.6
CR1-G138-P	Harold	Capp	41.8
CR1-G139-P	Donald	Haacke	39.8

There were no changes in sound pressure results or compliance with Codington or Grant County requirements for sound pressure limits.



windPRO

Norwich VT

Buenos Aires ARG

Fargo ND

Bismarck ND

Minot ND

Williston ND

Bemidji MN

The receptors that changed from participating to non-participating were not within the Crowned Ridge project area. They are included in the Crowned Ridge II project.

I have attached updated maps and results tables that reflect the changes in participation status for the noise receptors.

Sincerely,

A handwritten signature in blue ink that reads "Jay Haley". The signature is written in a cursive, flowing style.

Jay Haley, P.E., Partner
For EAPC Wind Energy

Attachments:

- Appendix A – Crowned Ridge Energy Project Site Overview Map
- Appendix B – Wind Turbine Coordinates
- Appendix C – Table of Sound Results
- Appendix D – Standard Resolution Sound Maps

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
Codrington 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	36.5	4,258
CR1-C2-NP	Non-P	Boundary	658,435	4,984,609	601.8	37.7	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	38.5	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	1,670
CR1-C13-P	Participant	Boundary	664,410	4,986,207	615.0	53.3	574
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	722
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	591
CR1-C19-P	Participant	Boundary	660,393	4,987,529	607.7	50.1	784
CR1-C20-P	Participant	Boundary	662,024	4,987,612	604.8	51.0	640
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	42.2	1,749
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	633
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	38.2	4,970
CR1-C33-NP	Non-P	Boundary	657,126	4,990,843	567.0	38.1	5,856
CR1-C34-NP	Non-P	Boundary	658,763	4,990,247	589.7	45.9	1,293
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	48.3	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	1,824
CR1-C45-NP	Non-P	Boundary	653,821	4,993,552	572.0	37.0	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	410
CR1-C49-P	Participant	Boundary	662,224	4,993,664	609.0	38.5	5,105
CR1-C50-P	Participant	Boundary	656,239	4,994,042	618.0	49.7	984
CR1-C51-P	Participant	Boundary	657,753	4,994,889	620.0	51.5	564
CR1-C52-NP	Non-P	Boundary	654,986	4,995,398	603.0	45.8	1,335
CR1-C53-NP	Non-P	Boundary	664,171	4,995,340	580.6	37.4	4,009
CR1-C54-NP	Non-P	Boundary	663,495	4,995,329	582.9	36.7	5,075
CR1-C55-P	Participant	Boundary	660,139	4,994,937	606.2	49.4	722
CR1-C56-P	Participant	Boundary	655,621	4,995,989	606.2	49.4	627
CR1-C57-P	Participant	Boundary	656,526	4,995,198	616.1	45.9	1,319
CR1-C58-P	Participant	Boundary	657,619	4,997,581	611.9	50.6	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	42.9	2,218
CR1-C61-NP	Non-P	Boundary	656,927	4,997,826	612.0	48.2	912
CR1-C62-NP	Non-P	Boundary	658,155	4,994,994	614.7	48.7	820
CR1-C63-NP	Non-P	Boundary	658,543	4,995,211	606.8	42.5	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	39.2	2,825
CR1-C70-NP	Non-P	Boundary	664,953	4,987,981	596.1	42.7	3,225
CR1-C71-NP	Non-P	Boundary	664,658	4,987,355	600.0	48.6	1,050
CR1-C105-NP	Non-P	Boundary	658,351	5,000,265	609.0	49.8	604
CR1-C106-P	Participant	Boundary	659,931	5,001,205	605.4	51.0	768
CR1-C107-NP	Non-P	Boundary	655,923	4,998,435	595.8	48.5	673
CR1-C109-NP	Non-P	Boundary	654,533	4,997,357	592.6	41.0	1,909
CR1-C110-NP	Non-P	Boundary	654,553	4,996,633	588.7	41.4	2,365
CR1-C111-NP	Non-P	Boundary	654,576	4,995,809	599.1	45.6	1,240
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	5,541
CR1-C2-NP	Non-P	Structure	658,791	4,984,483	601.6	37.4	6,273
CR1-C3-NP	Non-P	Structure	657,888	4,984,697	604.2	38.8	3,294
CR1-C4-NP	Non-P	Structure	659,744	4,984,749	605.9	38.5	5,981
CR1-C5-NP	Non-P	Structure	659,958	4,984,794	605.2	38.9	5,659
CR1-C6-P	Participant	Structure	662,989	4,995,228	599.8	36.5	6,102
CR1-C7-NP	Non-P	Structure	660,893	4,984,861	593.2	41.3	3,022
CR1-C8-P	Participant	Structure	660,532	4,984,445	599.7	40.1	3,740
CR1-C9-P	Participant	Structure	665,352	4,985,004	609.0	47.7	1,621
CR1-C10-P	Participant	Structure	663,510	4,985,195	609.0	47.0	1,762

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-C11-P	Participant	Structure	664,111	4,985,679	609.0	47.9	1,614
CR1-C12-P	Participant	Structure	662,222	4,985,736	603.0	44.3	2,201
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	1,739
CR1-C14-NP	Non-P	Structure	657,982	4,985,894	609.0	43.4	1,880
CR1-C15-P	Participant	Structure	663,291	4,986,026	615.0	46.1	1,952
CR1-C16-NP	Non-P	Structure	661,960	4,986,288	606.0	43.3	2,736
CR1-C17-P	Participant	Structure	658,031	4,986,373	609.1	45.1	1,886
CR1-C18-P	Participant	Structure	663,651	4,987,157	610.5	44.8	2,146
CR1-C19-P	Participant	Structure	659,243	4,987,276	611.5	46.4	1,722
CR1-C20-P	Participant	Structure	663,054	4,987,455	606.0	44.5	2,336
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	3,484
CR1-C27-NP	Non-P	Structure	656,876	4,988,683	583.0	40.0	2,549
CR1-C28-NP	Non-P	Structure	665,429	4,988,598	590.8	42.1	2,831
CR1-C29-NP	Non-P	Structure	666,572	4,988,867	575.9	41.4	2,457
CR1-C30-P	Participant	Structure	661,699	4,988,957	615.0	47.9	1,614
CR1-C31-NP	Non-P	Structure	665,939	4,988,950	585.4	43.4	2,126
CR1-C32-NP	Non-P	Structure	655,843	4,989,581	568.6	37.1	3,714
CR1-C33-NP	Non-P	Structure	656,839	4,990,404	569.8	37.4	6,719
CR1-C34-NP	Non-P	Structure	658,661	4,990,389	589.1	44.5	1,726
CR1-C35-P	Participant	Structure	662,025	4,990,475	609.0	43.9	2,123
CR1-C36-P	Participant	Structure	663,181	4,990,600	615.0	46.2	1,532
CR1-C37-P	Participant	Structure	663,563	4,991,342	605.1	46.5	1,631
CR1-C38-NP	Non-P	Structure	660,639	4,991,557	597.0	41.0	3,474
CR1-C39-NP	Non-P	Structure	660,144	4,991,670	588.0	42.3	2,605
CR1-C40-NP	Non-P	Structure	657,865	4,991,818	583.8	41.5	2,690
CR1-C41-NP	Non-P	Structure	665,053	4,992,084	576.1	45.0	2,359
CR1-C42-P	Participant	Structure	659,458	4,992,229	580.0	44.6	1,801
CR1-C44-NP	Non-P	Structure	665,076	4,993,095	578.2	44.0	2,155
CR1-C45-NP	Non-P	Structure	653,390	4,993,503	573.0	35.4	5,673
CR1-C46-P	Participant	Structure	655,802	4,993,540	609.7	46.0	1,680
CR1-C47-P	Participant	Structure	662,825	4,993,508	613.8	39.5	3,750
CR1-C48-P	Participant	Structure	664,247	4,993,646	588.0	44.7	1,847
CR1-C49-P	Participant	Structure	662,250	4,993,731	609.0	38.4	5,148
CR1-C50-P	Participant	Structure	656,806	4,994,388	621.0	46.8	1,591

[illegible]

Table C-1: Crowned Ridge Sound Level Tabular Results Sorted by Receptor ID

Realistic case sound results at occupied 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	38.8	3,940
CR1-G15-P	Participant	Structure	668,396	4,989,607	576.0	40.1	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	42.6	2,185
CR1-G24-P	Participant	Structure	673,058	4,992,440	539.4	40.6	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	34.0	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	35.5	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	38.1	3,819
CR1-G43-NP	Non-P	Structure	661,141	5,001,721	584.2	43.0	1,909
CR1-G44-NP	Non-P	Structure	661,781	5,001,732	583.7	39.2	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	36.4	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-G81-P	Participant	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	35.3	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	40.1	2,152
CR1-G110-NP	Non-P	Structure	671,218	5,005,064	456.4	34.8	5,889
CR1-G113-NP	Non-P	Structure	666,228	5,005,549	537.0	40.3	2,746
CR1-G114-NP	Non-P	Structure	666,214	5,006,667	520.8	40.8	2,205

[illegible]

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-C48-P	Participant	Boundary	664,262	4,992,514	586.8	53.6	410
CR1-C13-P	Participant	Boundary	664,410	4,986,207	615.0	53.3	574
CR1-C18-P	Participant	Boundary	664,126	4,986,525	610.2	52.4	591
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-C51-P	Participant	Boundary	657,753	4,994,889	620.0	51.5	564
CR1-C46-P	Participant	Boundary	656,678	4,992,970	611.5	51.4	561
CR1-C30-P	Participant	Boundary	661,978	4,989,318	613.3	51.3	633
CR2-C150-P	Participant	Boundary	657,308	4,986,173	600.0	51.3	591
CR1-C15-P	Participant	Boundary	663,047	4,985,700	612.8	51.1	722
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	640
CR1-C106-P	Participant	Boundary	659,931	5,001,205	605.4	51.0	768
CR1-C58-P	Participant	Boundary	657,619	4,997,581	611.9	50.6	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	784
CR1-C64-P	Participant	Boundary	659,129	4,991,995	576.5	49.9	679
CR1-C105-NP	Non-P	Boundary	658,351	5,000,265	609.0	49.8	604
CR1-C50-P	Participant	Boundary	656,239	4,994,042	618.0	49.7	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-C56-P	Participant	Boundary	655,621	4,995,989	606.2	49.4	627
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	48.7	820
CR1-C71-NP	Non-P	Boundary	664,658	4,987,355	600.0	48.6	1,050
CR1-C39-NP	Non-P	Boundary	659,741	4,991,242	583.2	48.5	856
CR1-C107-NP	Non-P	Boundary	655,923	4,998,435	595.8	48.5	673
CR1-C36-P	Participant	Boundary	663,564	4,990,731	610.7	48.3	1,033
CR1-C61-NP	Non-P	Boundary	656,927	4,997,826	612.0	48.2	912
CR1-C38-NP	Non-P	Boundary	660,955	4,990,468	591.2	47.3	1,027
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-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	45.9	1,293
CR1-C57-P	Participant	Boundary	656,526	4,995,198	616.1	45.9	1,319
CR1-C52-NP	Non-P	Boundary	654,986	4,995,398	603.0	45.8	1,335

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-C111-NP	Non-P	Boundary	654,576	4,995,809	599.1	45.6	1,240
CR1-C12-P	Participant	Boundary	662,067	4,985,677	604.9	45.3	1,670
CR1-C17-P	Participant	Boundary	658,017	4,986,369	606.4	45.2	1,837
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	1,824
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-C60-NP	Non-P	Boundary	656,909	4,998,465	609.3	42.9	2,218
CR1-C70-NP	Non-P	Boundary	664,953	4,987,981	596.1	42.7	3,225
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	42.5	2,277
CR1-C27-NP	Non-P	Boundary	656,658	4,988,484	587.2	42.2	1,749
CR1-C110-NP	Non-P	Boundary	654,553	4,996,633	588.7	41.4	2,365
CR1-C109-NP	Non-P	Boundary	654,533	4,997,357	592.6	41.0	1,909
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	39.2	2,825
CR1-C49-P	Participant	Boundary	662,224	4,993,664	609.0	38.5	5,105
CR1-C6-P	Participant	Boundary	663,383	4,994,502	591.0	38.5	3,878
CR1-C32-NP	Non-P	Boundary	657,187	4,989,566	573.0	38.2	4,970
CR1-C33-NP	Non-P	Boundary	657,126	4,990,843	567.0	38.1	5,856
CR1-C2-NP	Non-P	Boundary	658,435	4,984,609	601.8	37.7	5,036
CR1-C53-NP	Non-P	Boundary	664,171	4,995,340	580.6	37.4	4,009
CR1-C45-NP	Non-P	Boundary	653,821	4,993,552	572.0	37.0	4,291
CR1-C54-NP	Non-P	Boundary	663,495	4,995,329	582.9	36.7	5,075
CR1-C1-NP	Non-P	Boundary	657,276	4,983,921	590.3	36.5	4,258
CR1-C11-P	Participant	Structure	664,111	4,985,679	609.0	47.9	1,614
CR1-C30-P	Participant	Structure	661,699	4,988,957	615.0	47.9	1,614
CR1-C9-P	Participant	Structure	665,352	4,985,004	609.0	47.7	1,621
CR1-C106-P	Participant	Structure	660,365	5,001,639	605.0	47.3	1,165
CR1-C10-P	Participant	Structure	663,510	4,985,195	609.0	47.0	1,762
CR1-C13-P	Participant	Structure	663,792	4,985,785	612.0	46.9	1,739
CR1-C50-P	Participant	Structure	656,806	4,994,388	621.0	46.8	1,591
CR1-C37-P	Participant	Structure	663,563	4,991,342	605.1	46.5	1,631
CR1-C19-P	Participant	Structure	659,243	4,987,276	611.5	46.4	1,722
CR1-C36-P	Participant	Structure	663,181	4,990,600	615.0	46.2	1,532

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	Structure	663,291	4,986,026	615.0	46.1	1,952
CR2-C150-P	Participant	Structure	657,178	4,985,788	612.0	46.1	1,640
CR1-C46-P	Participant	Structure	655,802	4,993,540	609.7	46.0	1,680
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	1,886
CR1-C58-P	Participant	Structure	657,781	4,996,906	615.0	45.1	1,647
CR1-C41-NP	Non-P	Structure	665,053	4,992,084	576.1	45.0	2,359
CR1-C64-P	Participant	Structure	659,436	4,992,174	581.0	44.9	1,614
CR1-C57-P	Participant	Structure	656,628	4,995,266	615.0	44.9	1,568
CR1-C18-P	Participant	Structure	663,651	4,987,157	610.5	44.8	2,146
CR1-C56-P	Participant	Structure	655,953	4,995,244	606.0	44.8	1,972
CR1-C48-P	Participant	Structure	664,247	4,993,646	588.0	44.7	1,847
CR1-C52-NP	Non-P	Structure	654,924	4,995,231	603.0	44.7	1,883
CR1-C61-NP	Non-P	Structure	656,690	4,997,831	612.0	44.7	1,686
CR1-C42-P	Participant	Structure	659,458	4,992,229	580.0	44.6	1,801
CR1-C20-P	Participant	Structure	663,054	4,987,455	606.0	44.5	2,336
CR1-C34-NP	Non-P	Structure	658,661	4,990,389	589.1	44.5	1,726
CR1-C12-P	Participant	Structure	662,222	4,985,736	603.0	44.3	2,201
CR1-C51-P	Participant	Structure	657,455	4,995,160	621.0	44.1	1,768
CR1-C44-NP	Non-P	Structure	665,076	4,993,095	578.2	44.0	2,155
CR1-C62-NP	Non-P	Structure	658,375	4,995,138	615.0	44.0	1,676
CR1-C107-NP	Non-P	Structure	656,811	4,999,855	598.8	44.0	1,401
CR1-C35-P	Participant	Structure	662,025	4,990,475	609.0	43.9	2,123
CR1-C108-P	Participant	Structure	656,978	4,997,092	609.0	43.9	1,939
CR1-C12-1-P	Participant	Structure	662,199	4,986,047	606.0	43.6	2,818
CR1-C14-NP	Non-P	Structure	657,982	4,985,894	609.0	43.4	1,880
CR1-C31-NP	Non-P	Structure	665,939	4,988,950	585.4	43.4	2,126
CR1-C16-NP	Non-P	Structure	661,960	4,986,288	606.0	43.3	2,736
CR1-C59-P	Participant	Structure	661,548	5,000,754	584.1	42.7	1,644
CR1-C60-NP	Non-P	Structure	656,855	4,998,565	613.5	42.4	2,592
CR1-C39-NP	Non-P	Structure	660,144	4,991,670	588.0	42.3	2,605
CR1-C63-NP	Non-P	Structure	658,566	4,995,254	612.6	42.2	2,408
CR1-C105-NP	Non-P	Structure	658,372	5,001,257	601.5	42.2	2,549
CR1-C70-NP	Non-P	Structure	665,135	4,988,293	595.7	42.1	3,540
CR1-C72-NP	Non-P	Structure	665,158	4,988,170	595.2	42.1	3,776
CR1-C71-NP	Non-P	Structure	665,137	4,988,378	594.6	42.1	3,448
CR1-C28-NP	Non-P	Structure	665,429	4,988,598	590.8	42.1	2,831

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Table C-2: Crowned Ridge Sound Level Tabular Results Sorted by Sound Level
Realistic case sound results at occupied 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-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-G28-P	Participant	Structure	673,113	4,994,772	514.1	43.2	1,614
CR1-G67-P	Participant	Structure	669,597	4,993,440	555.8	43.2	2,106
CR1-G43-NP	Non-P	Structure	661,141	5,001,721	584.2	43.0	1,909
CR1-G68-NP	Non-P	Structure	669,159	4,993,632	564.7	43.0	2,113
CR1-G128-P	Participant	Structure	670,242	5,001,314	513.0	42.9	2,612
CR1-G131-P	Participant	Structure	668,466	5,005,145	505.1	42.9	2,133
CR1-G125-P	Participant	Structure	668,289	5,000,643	543.0	42.8	1,716
CR1-G124-P	Participant	Structure	669,843	5,000,605	525.0	42.7	1,791
CR1-G23-NP	Non-P	Structure	670,471	4,992,104	560.1	42.6	2,185
CR1-G135-P	Participant	Structure	668,616	5,005,161	504.2	42.6	2,142
CR1-G136-P	Participant	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-P	Participant	Structure	664,809	5,006,456	549.0	41.8	1,824
CR1-G137-P	Participant	Structure	666,501	5,005,136	529.5	41.6	1,939
CR1-G149-NP	Non-P	Structure	669,284	5,003,283	503.2	41.0	2,815
CR1-G34-NP	Non-P	Structure	671,320	4,995,798	531.0	40.8	2,238
CR1-G114-NP	Non-P	Structure	666,214	5,006,667	520.8	40.8	2,205
CR1-G81-P	Participant	Structure	671,478	4,997,523	508.7	40.7	2,421
CR1-G24-P	Participant	Structure	673,058	4,992,440	539.4	40.6	2,231
CR1-G132-P	Participant	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	40.5	2,188
CR1-G113-NP	Non-P	Structure	666,228	5,005,549	537.0	40.3	2,746
CR1-G15-P	Participant	Structure	668,396	4,989,607	576.0	40.1	2,746
CR1-G109-NP	Non-P	Structure	667,064	5,000,425	566.4	40.1	2,152
CR1-G33-P	Participant	Structure	668,911	4,995,550	548.7	39.9	2,779
CR1-G26-NP	Non-P	Structure	672,589	4,993,869	531.0	39.9	3,140
CR1-G139-P	Participant	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-G59-P	Participant	Structure	675,755	4,994,888	488.3	39.6	2,605
CR1-G126-P	Participant	Structure	672,157	5,000,446	484.3	39.4	3,176
CR1-G130-P	Participant	Structure	668,147	5,000,233	549.0	39.3	3,005

continued

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February 19, 2019

Tyler Wilhelm
Project Manager
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, FL 33408
Office: (561) 694-3193
Tyler.Wilhelm@nee.com

Subject: Crowned Ridge additional structures

Dear Mr. Wilhelm,

This letter is intended to provide updated landowner participation status information that was not included in the original report titled: "Final Report, Crowned Ridge Wind Farm Shadow Flicker Study, Codington and Grant Counties, SD", dated February 6, 2019, submitted by EAPC Wind Energy.

After the report was submitted, I was made aware of updated land parcel and farmstead status databases. There were a number of changes in landowner participation status from the original report. Most were changed from non-participating to participating, with a few that changed from participating to non-participating.

There were no changes in compliance with Codington or Grant County requirements for shadow flicker limits.

I have attached updated maps and results tables that reflect the changes in participation status for the shadow flicker receptors.

Sincerely,

Jay Haley, P.E., Partner
For EAPC Wind Energy

Attachments:

Appendix A – Crowned Ridge Energy Project Site Overview Map
Appendix B – Wind Turbine Coordinates
Appendix C – Table of Sound Results
Appendix D – Standard Resolution Sound Maps
Appendix C – Table of Shadow Flicker Results
Appendix D – Standard Resolution Shadow Flicker Maps



Norwich VT

Buenos Aires ARG

Fargo ND

Bismarck ND

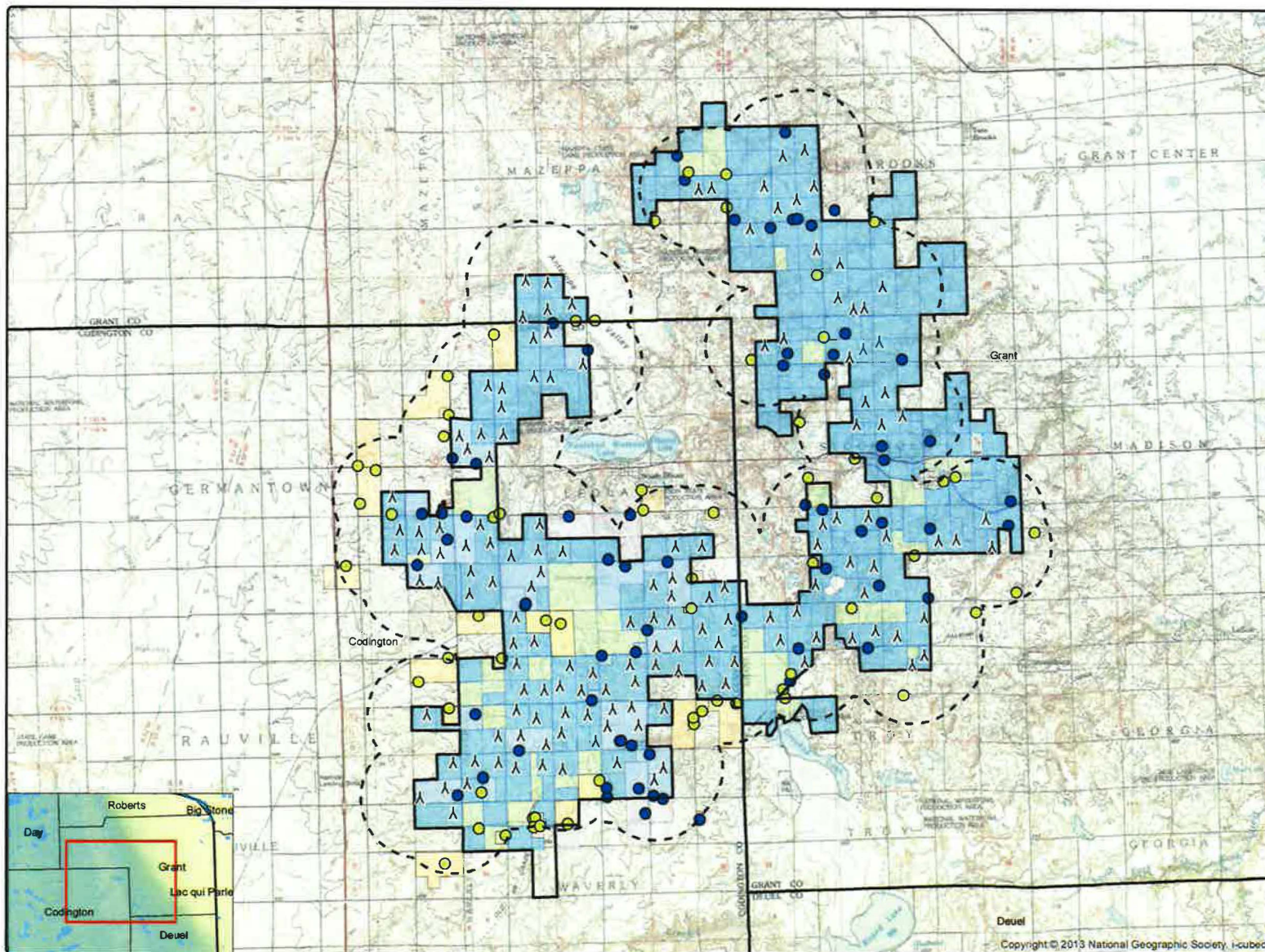
Minot ND

Williston ND

Bemidji MN

001525

APPENDIX A: CROWNED RIDGE WIND ENERGY PROJECT SITE OVERVIEW MAP



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 structures.

Codington County land parcels within 2 km of a wind turbine.

Location: Watertown, SD

Project #: 20174431

Issue Dates

#	Description	Date
1	Original	2019.02.15
2	Revised	

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

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0 0.75 1.5 3 Mile



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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

[illegible]

APPENDIX C: TABLE OF SHADOW FLICKER RESULTS

Table C-1: Crowned Ridge Shadow Flicker Tabular Results Sorted by Receptor ID**Realistic case shadow results at 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	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-C1-NP	Non-P	656,743.00	4,983,525.00	595.9	0:00	5,541
CR1-C2-NP	Non-P	658,791.00	4,984,483.00	601.6	0:00	6,273
CR1-C3-NP	Non-P	657,888.00	4,984,697.00	604.2	4:10	3,294
CR1-C4-NP	Non-P	659,744.00	4,984,749.00	605.9	0:00	5,981
CR1-C5-NP	Non-P	659,958.00	4,984,794.00	605.2	0:00	5,659
CR1-C6-P	Participant	662,989.00	4,995,228.00	599.8	0:00	6,102
CR1-C7-NP	Non-P	660,893.00	4,984,861.00	593.2	0:00	3,022
CR1-C9-P	Participant	665,352.00	4,985,004.00	609.0	18:25	1,621
CR1-C10-P	Participant	663,510.00	4,985,195.00	609.0	12:59	1,762
CR1-C11-P	Participant	664,111.00	4,985,679.00	609.0	12:03	1,614
CR1-C12-1-P	Participant	662,199.00	4,986,047.00	606.0	10:06	2,818
CR1-C12-P	Participant	662,222.00	4,985,736.00	603.0	18:29	2,201
CR1-C13-P	Participant	663,792.00	4,985,785.00	612.0	22:39	1,739
CR1-C14-NP	Non-P	657,982.00	4,985,894.00	609.0	9:59	1,880
CR1-C15-P	Participant	663,291.00	4,986,026.00	615.0	21:43	1,952
CR1-C16-NP	Non-P	661,960.00	4,986,288.00	606.0	7:49	2,736
CR1-C17-P	Participant	658,031.00	4,986,373.00	609.1	26:40	1,886
CR1-C18-P	Participant	663,651.00	4,987,157.00	610.5	23:07	2,146
CR1-C19-P	Participant	659,243.00	4,987,276.00	611.5	21:20	1,722
CR1-C20-P	Participant	663,054.00	4,987,455.00	606.0	16:02	2,336
CR1-C26-P	Participant	657,767.00	4,988,493.00	597.0	7:32	3,484
CR1-C27-NP	Non-P	656,876.00	4,988,683.00	583.0	6:58	2,549
CR1-C28-NP	Non-P	665,429.00	4,988,598.00	590.8	2:43	2,831
CR1-C29-NP	Non-P	666,572.00	4,988,867.00	575.9	6:54	2,457
CR1-C30-P	Participant	661,699.00	4,988,957.00	615.0	23:21	1,614
CR1-C31-NP	Non-P	665,939.00	4,988,950.00	585.4	0:00	2,126
CR1-C32-NP	Non-P	655,843.00	4,989,581.00	568.6	0:00	3,714
CR1-C33-NP	Non-P	656,839.00	4,990,404.00	569.8	0:00	6,719
CR1-C34-NP	Non-P	658,661.00	4,990,389.00	589.1	26:03	1,726
CR1-C35-P	Participant	662,025.00	4,990,475.00	609.0	11:47	2,123
CR1-C36-P	Participant	663,181.00	4,990,600.00	615.0	25:52	1,532
CR1-C37-P	Participant	663,563.00	4,991,342.00	605.1	27:44	1,631
CR1-C38-NP	Non-P	660,639.00	4,991,557.00	597.0	6:04	3,474
CR1-C39-NP	Non-P	660,144.00	4,991,670.00	588.0	6:55	2,605
CR1-C40-NP	Non-P	657,865.00	4,991,818.00	583.8	6:42	2,690
CR1-C41-NP	Non-P	665,053.00	4,992,084.00	576.1	20:43	2,359
CR1-C42-P	Participant	659,458.00	4,992,229.00	580.0	11:54	1,801
CR1-C44-NP	Non-P	665,076.00	4,993,095.00	578.2	28:20	2,155
CR1-C45-NP	Non-P	653,390.00	4,993,503.00	573.0	1:41	5,673

Table C-1: Crowned Ridge Shadow Flicker Tabular Results Sorted by Receptor ID
Realistic case shadow results at 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	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-C46-P	Participant	655,802.00	4,993,540.00	609.7	25:38	1,680
CR1-C47-P	Participant	662,825.00	4,993,508.00	613.8	5:00	3,750
CR1-C48-P	Participant	664,247.00	4,993,646.00	588.0	3:46	1,847
CR1-C49-P	Participant	662,250.00	4,993,731.00	609.0	1:12	5,148
CR1-C50-P	Participant	656,806.00	4,994,388.00	621.0	28:30	1,591
CR1-C51-P	Participant	657,455.00	4,995,160.00	621.0	24:39	1,768
CR1-C52-NP	Non-P	654,924.00	4,995,231.00	603.0	11:17	1,883
CR1-C53-NP	Non-P	663,376.00	4,996,043.00	578.6	0:00	7,201
CR1-C54-NP	Non-P	663,421.00	4,995,376.00	583.4	0:00	5,351
CR1-C55-P	Participant	660,914.00	4,995,169.00	607.9	2:51	3,360
CR1-C56-P	Participant	655,953.00	4,995,244.00	606.0	28:42	1,972
CR1-C57-P	Participant	656,628.00	4,995,266.00	615.0	10:38	1,568
CR1-C58-P	Participant	657,781.00	4,996,906.00	615.0	17:06	1,647
CR1-C59-P	Participant	661,548.00	5,000,754.00	584.1	7:36	1,644
CR1-C60-NP	Non-P	656,855.00	4,998,565.00	613.5	14:17	2,592
CR1-C61-NP	Non-P	656,690.00	4,997,831.00	612.0	49:06	1,686
CR1-C62-NP	Non-P	658,375.00	4,995,138.00	615.0	18:05	1,676
CR1-C63-NP	Non-P	658,566.00	4,995,254.00	612.6	10:42	2,408
CR1-C64-P	Participant	659,436.00	4,992,174.00	581.0	19:47	1,614
CR1-C65-NP	Non-P	665,805.00	4,995,305.00	579.0	1:29	3,884
CR1-C66-NP	Non-P	659,718.00	4,985,032.00	606.0	0:00	5,800
CR1-C67-NP	Non-P	659,789.00	4,985,057.00	606.0	0:00	5,791
CR1-C68-P	Participant	662,652.00	4,987,606.00	609.0	8:10	2,146
CR1-C69-P	Participant	662,685.00	4,987,619.00	609.0	7:45	2,185
CR1-C70-NP	Non-P	665,135.00	4,988,293.00	595.7	12:05	3,540
CR1-C71-NP	Non-P	665,137.00	4,988,378.00	594.6	7:28	3,448
CR1-C72-NP	Non-P	665,158.00	4,988,170.00	595.2	7:38	3,776
CR1-C105-NP	Non-P	658,372.48	5,001,256.80	601.5	19:53	2,549
CR1-C106-P	Participant	660,365.47	5,001,639.21	605.0	50:20	1,165
CR1-C107-NP	Non-P	656,810.99	4,999,855.15	598.8	9:57	1,401
CR1-C108-P	Participant	656,977.64	4,997,092.26	609.0	16:58	1,939
CR1-C109-NP	Non-P	653,780.18	4,996,828.35	588.0	7:04	4,797
CR1-C110-NP	Non-P	654,384.54	4,996,685.57	593.9	20:47	2,910
CR1-C111-NP	Non-P	653,857.19	4,995,573.17	591.0	11:42	3,678
CR2-C150-P	Participant	657,178.00	4,985,788.00	612.0	9:58	1,640

Table C-1: Crowned Ridge Shadow Flicker Tabular Results Sorted by Receptor ID**Realistic case shadow results at occupied 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	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-G12-NP	Non-P	668,229.00	4,989,039.00	575.0	0:00	4,623
CR1-G13-NP	Non-P	672,216.00	4,989,142.00	558.0	0:00	3,576
CR1-G14-NP	Non-P	668,156.00	4,989,332.00	574.1	0:00	3,940
CR1-G15-P	Participant	668,396.00	4,989,607.00	576.0	0:00	2,746
CR1-G16-NP	Non-P	668,419.00	4,989,861.00	576.0	0:00	2,070
CR1-G18-P	Participant	668,678.00	4,990,722.00	585.0	22:28	1,585
CR1-G19-P	Participant	671,018.00	4,990,744.00	570.0	5:42	2,077
CR1-G21-P	Participant	666,766.00	4,991,807.00	577.1	28:59	1,555
CR1-G22-NP	Non-P	674,670.00	4,991,955.00	527.6	0:00	5,781
CR1-G23-NP	Non-P	670,471.00	4,992,104.00	560.1	5:16	2,185
CR1-G24-P	Participant	673,058.00	4,992,440.00	539.4	0:00	2,231
CR1-G25-P	Participant	671,391.00	4,992,858.00	549.0	14:36	1,804
CR1-G26-NP	Non-P	672,589.00	4,993,869.00	531.0	8:15	3,140
CR1-G27-NP	Non-P	676,630.00	4,994,642.00	480.8	2:54	4,944
CR1-G28-P	Participant	673,113.00	4,994,772.00	514.1	22:47	1,614
CR1-G32-P	Participant	669,477.00	4,995,401.00	546.0	19:55	1,545
CR1-G33-P	Participant	668,911.00	4,995,550.00	548.7	4:00	2,779
CR1-G34-NP	Non-P	671,320.00	4,995,798.00	531.0	1:28	2,238
CR1-G36-NP	Non-P	673,559.00	4,996,344.00	498.1	0:00	6,211
CR1-G37-NP	Non-P	668,998.00	4,996,452.00	549.0	0:00	5,246
CR1-G38-NP	Non-P	673,972.00	4,996,493.00	494.5	0:00	5,646
CR1-G41-P	Participant	671,563.00	4,997,050.00	497.7	0:00	3,983
CR1-G42-NP	Non-P	670,566.00	4,997,097.00	518.9	0:00	3,819
CR1-G43-NP	Non-P	661,141.00	5,001,721.00	584.2	18:19	1,909
CR1-G44-NP	Non-P	661,781.00	5,001,732.00	583.7	2:49	3,123
CR1-G59-P	Participant	675,755.00	4,994,888.00	488.3	12:40	2,605
CR1-G60-P	Participant	675,830.00	4,995,687.00	477.0	5:42	3,343
CR1-G65-P	Participant	671,496.00	4,994,973.00	537.0	29:50	1,539
CR1-G66-P	Participant	670,802.00	4,994,681.00	539.8	16:39	1,801
CR1-G67-P	Participant	669,597.00	4,993,440.00	555.8	12:03	2,106
CR1-G68-NP	Non-P	669,159.00	4,993,632.00	564.7	2:09	2,113
CR1-G77-NP	Non-P	676,031.00	4,992,629.00	503.1	0:00	5,728
CR1-G81-P	Participant	671,478.00	4,997,523.00	508.7	0:00	2,421
CR1-G105-NP	Non-P	668,696.00	4,998,325.00	549.0	0:00	6,345
CR1-G108-NP	Non-P	669,516.00	5,001,186.00	522.2	11:37	3,586
CR1-G109-NP	Non-P	667,064.00	5,000,425.00	566.4	0:59	2,152
CR1-G110-NP	Non-P	671,218.00	5,005,064.00	456.4	0:00	5,889
CR1-G113-NP	Non-P	666,228.00	5,005,549.00	537.0	7:15	2,746

[illegible]

Table C-2: Crowned Ridge Shadow Flicker Tabular Results Sorted by Real Case Shadow Flicker Hours/Year**Realistic case shadow results at 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	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-C106-P	Participant	660,365.47	5,001,639.21	605.0	50:20	1,165
CR1-C61-NP	Non-P	656,690.00	4,997,831.00	612.0	49:06	1,686
CR1-C56-P	Participant	655,953.00	4,995,244.00	606.0	28:42	1,972
CR1-C50-P	Participant	656,806.00	4,994,388.00	621.0	28:30	1,591
CR1-C44-NP	Non-P	665,076.00	4,993,095.00	578.2	28:20	2,155
CR1-C37-P	Participant	663,563.00	4,991,342.00	605.1	27:44	1,631
CR1-C17-P	Participant	658,031.00	4,986,373.00	609.1	26:40	1,886
CR1-C34-NP	Non-P	658,661.00	4,990,389.00	589.1	26:03	1,726
CR1-C36-P	Participant	663,181.00	4,990,600.00	615.0	25:52	1,532
CR1-C46-P	Participant	655,802.00	4,993,540.00	609.7	25:38	1,680
CR1-C51-P	Participant	657,455.00	4,995,160.00	621.0	24:39	1,768
CR1-C30-P	Participant	661,699.00	4,988,957.00	615.0	23:21	1,614
CR1-C18-P	Participant	663,651.00	4,987,157.00	610.5	23:07	2,146
CR1-C13-P	Participant	663,792.00	4,985,785.00	612.0	22:39	1,739
CR1-C15-P	Participant	663,291.00	4,986,026.00	615.0	21:43	1,952
CR1-C19-P	Participant	659,243.00	4,987,276.00	611.5	21:20	1,722
CR1-C110-NP	Non-P	654,384.54	4,996,685.57	593.9	20:47	2,910
CR1-C41-NP	Non-P	665,053.00	4,992,084.00	576.1	20:43	2,359
CR1-C105-NP	Non-P	658,372.48	5,001,256.80	601.5	19:53	2,549
CR1-C64-P	Participant	659,436.00	4,992,174.00	581.0	19:47	1,614
CR1-C12-P	Participant	662,222.00	4,985,736.00	603.0	18:29	2,201
CR1-C9-P	Participant	665,352.00	4,985,004.00	609.0	18:25	1,621
CR1-C62-NP	Non-P	658,375.00	4,995,138.00	615.0	18:05	1,676
CR1-C58-P	Participant	657,781.00	4,996,906.00	615.0	17:06	1,647
CR1-C108-P	Participant	656,977.64	4,997,092.26	609.0	16:58	1,939
CR1-C20-P	Participant	663,054.00	4,987,455.00	606.0	16:02	2,336
CR1-C60-NP	Non-P	656,855.00	4,998,565.00	613.5	14:17	2,592
CR1-C10-P	Participant	663,510.00	4,985,195.00	609.0	12:59	1,762
CR1-C70-NP	Non-P	665,135.00	4,988,293.00	595.7	12:05	3,540
CR1-C11-P	Participant	664,111.00	4,985,679.00	609.0	12:03	1,614
CR1-C42-P	Participant	659,458.00	4,992,229.00	580.0	11:54	1,801
CR1-C35-P	Participant	662,025.00	4,990,475.00	609.0	11:47	2,123
CR1-C111-NP	Non-P	653,857.19	4,995,573.17	591.0	11:42	3,678
CR1-C52-NP	Non-P	654,924.00	4,995,231.00	603.0	11:17	1,883
CR1-C63-NP	Non-P	658,566.00	4,995,254.00	612.6	10:42	2,408
CR1-C57-P	Participant	656,628.00	4,995,266.00	615.0	10:38	1,568
CR1-C12-1-P	Participant	662,199.00	4,986,047.00	606.0	10:06	2,818
CR1-C14-NP	Non-P	657,982.00	4,985,894.00	609.0	9:59	1,880
CR2-C150-P	Participant	657,178.00	4,985,788.00	612.0	9:58	1,640

Table C-2: Crowned Ridge Shadow Flicker Tabular Results Sorted by Real Case Shadow Flicker Hours/Year
Realistic case shadow results at 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

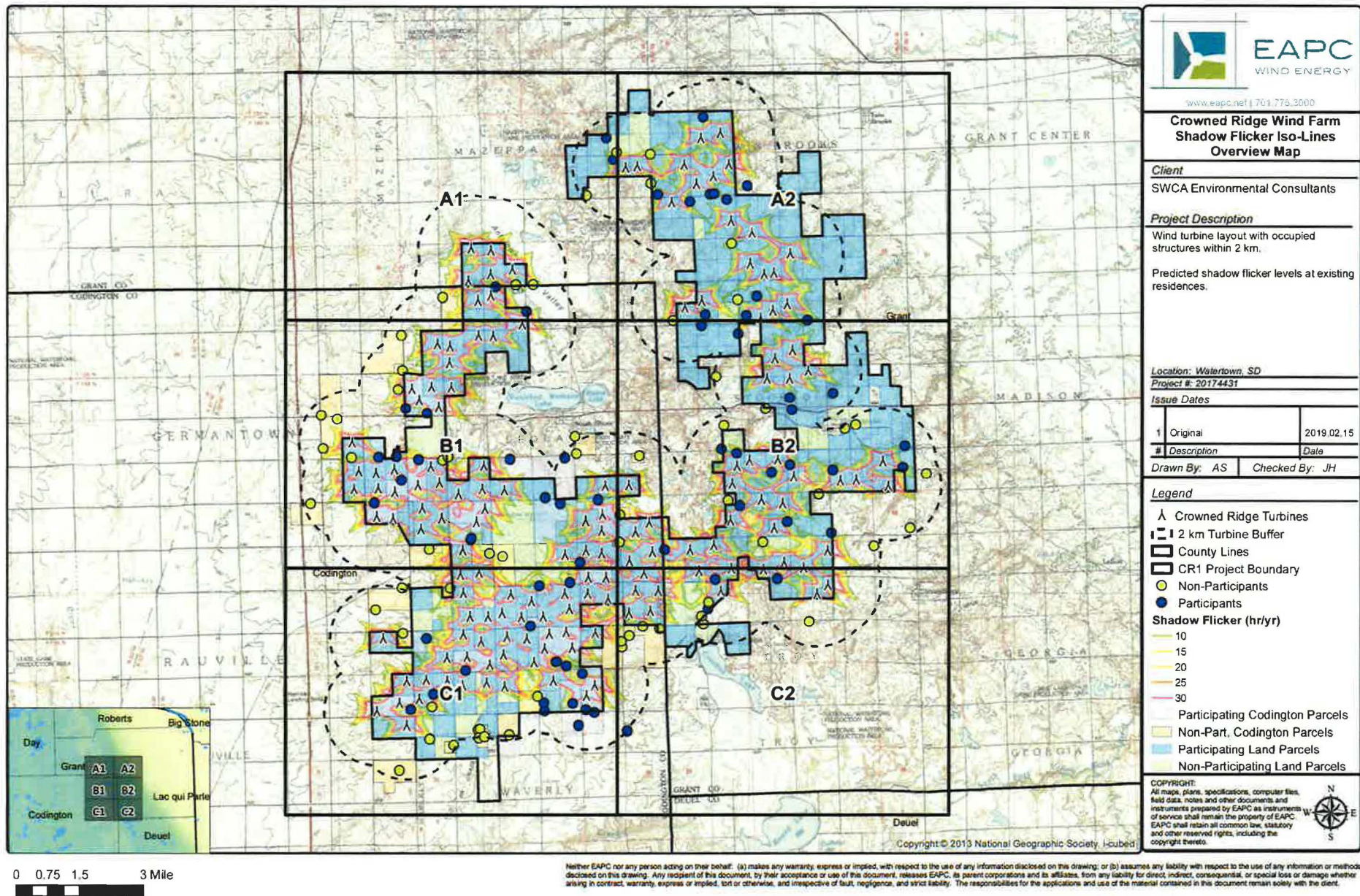
Receptor ID	Participation Status	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-C107-NP	Non-P	656,810.99	4,999,855.15	598.8	9:57	1,401
CR1-C68-P	Participant	662,652.00	4,987,606.00	609.0	8:10	2,146
CR1-C16-NP	Non-P	661,960.00	4,986,288.00	606.0	7:49	2,736
CR1-C69-P	Participant	662,685.00	4,987,619.00	609.0	7:45	2,185
CR1-C72-NP	Non-P	665,158.00	4,988,170.00	595.2	7:38	3,776
CR1-C59-P	Participant	661,548.00	5,000,754.00	584.1	7:36	1,644
CR1-C26-P	Participant	657,767.00	4,988,493.00	597.0	7:32	3,484
CR1-C71-NP	Non-P	665,137.00	4,988,378.00	594.6	7:28	3,448
CR1-C109-NP	Non-P	653,780.18	4,996,828.35	588.0	7:04	4,797
CR1-C27-NP	Non-P	656,876.00	4,988,683.00	583.0	6:58	2,549
CR1-C39-NP	Non-P	660,144.00	4,991,670.00	588.0	6:55	2,605
CR1-C29-NP	Non-P	666,572.00	4,988,867.00	575.9	6:54	2,457
CR1-C40-NP	Non-P	657,865.00	4,991,818.00	583.8	6:42	2,690
CR1-C38-NP	Non-P	660,639.00	4,991,557.00	597.0	6:04	3,474
CR1-C47-P	Participant	662,825.00	4,993,508.00	613.8	5:00	3,750
CR1-C3-NP	Non-P	657,888.00	4,984,697.00	604.2	4:10	3,294
CR1-C48-P	Participant	664,247.00	4,993,646.00	588.0	3:46	1,847
CR1-C55-P	Participant	660,914.00	4,995,169.00	607.9	2:51	3,360
CR1-C28-NP	Non-P	665,429.00	4,988,598.00	590.8	2:43	2,831
CR1-C45-NP	Non-P	653,390.00	4,993,503.00	573.0	1:41	5,673
CR1-C65-NP	Non-P	665,805.00	4,995,305.00	579.0	1:29	3,884
CR1-C49-P	Participant	662,250.00	4,993,731.00	609.0	1:12	5,148
CR1-C1-NP	Non-P	656,743.00	4,983,525.00	595.9	0:00	5,541
CR1-C2-NP	Non-P	658,791.00	4,984,483.00	601.6	0:00	6,273
CR1-C7-NP	Non-P	660,893.00	4,984,861.00	593.2	0:00	3,022
CR1-C32-NP	Non-P	655,843.00	4,989,581.00	568.6	0:00	3,714
CR1-C31-NP	Non-P	665,939.00	4,988,950.00	585.4	0:00	2,126
CR1-C54-NP	Non-P	663,421.00	4,995,376.00	583.4	0:00	5,351
CR1-C33-NP	Non-P	656,839.00	4,990,404.00	569.8	0:00	6,719
CR1-C53-NP	Non-P	663,376.00	4,996,043.00	578.6	0:00	7,201
CR1-C6-P	Participant	662,989.00	4,995,228.00	599.8	0:00	6,102
CR1-C66-NP	Non-P	659,718.00	4,985,032.00	606.0	0:00	5,800
CR1-C4-NP	Non-P	659,744.00	4,984,749.00	605.9	0:00	5,981
CR1-C67-NP	Non-P	659,789.00	4,985,057.00	606.0	0:00	5,791
CR1-C5-NP	Non-P	659,958.00	4,984,794.00	605.2	0:00	5,659

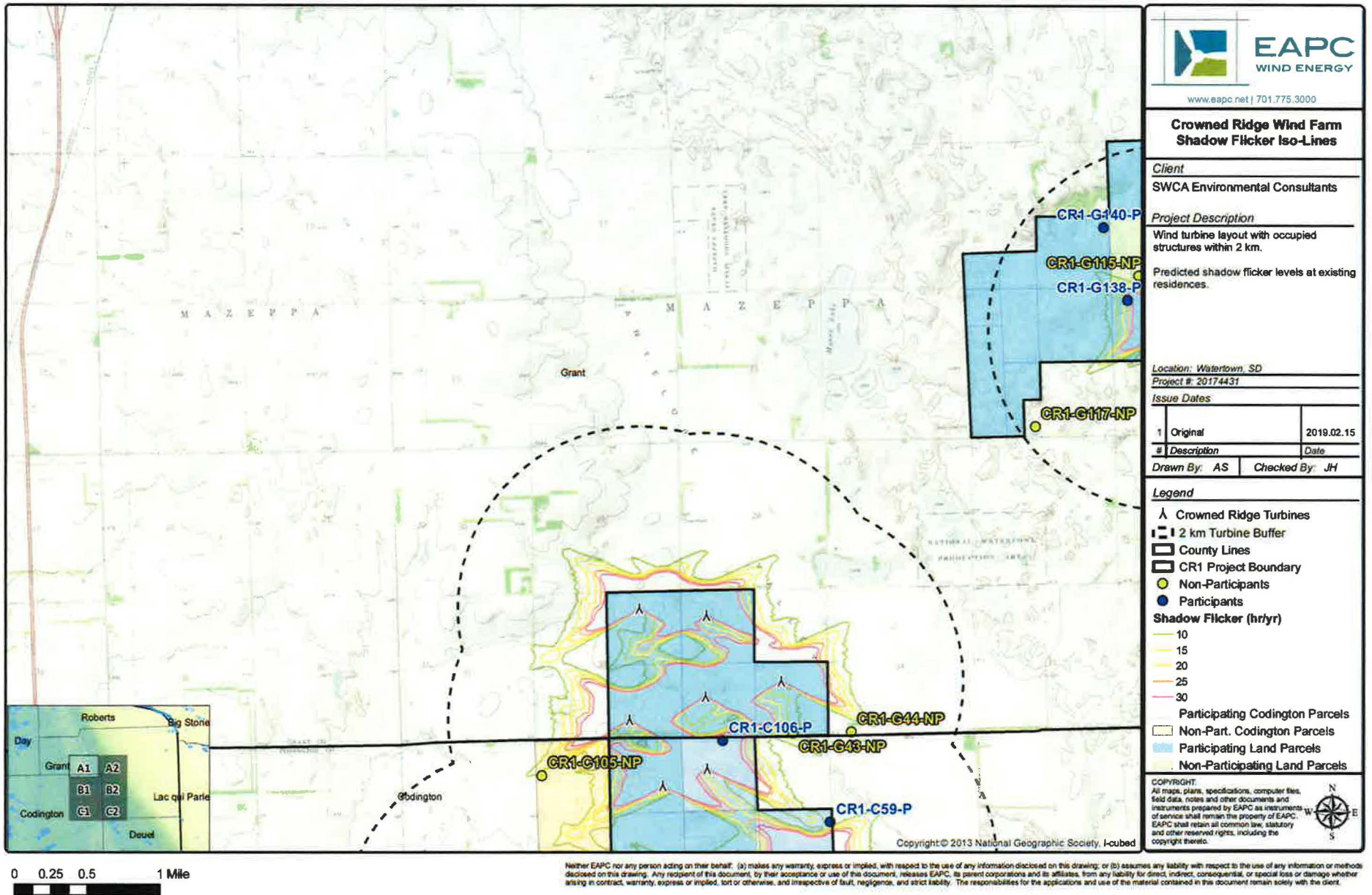
Table C-2: Crowned Ridge Shadow Flicker Tabular Results Sorted by Real Case Shadow Flicker Hours/Year
Realistic case shadow results at occupied structures
Results using GE 2.3-116-90 m HH, GE 2.3-116-80 m HH WTG's
UTM NAD83 Zone 14
Grant County
continued

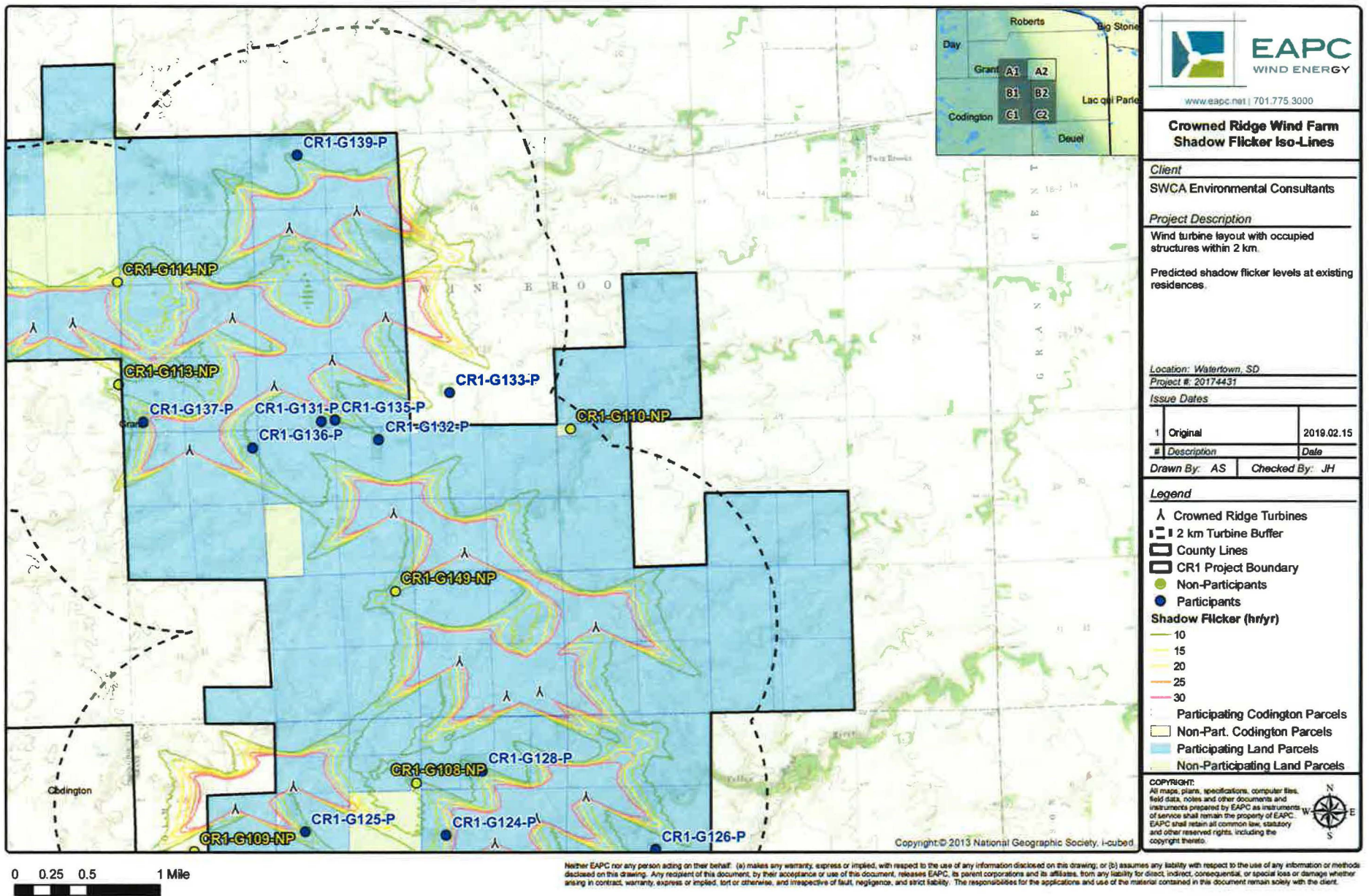
Receptor ID	Participation Status	Easting (m)	Northing (m)	Elevation AMSL (m)	Real Case Shadow (hrs/year)	Distance to Nearest Turbine (ft)
CR1-G65-P	Participant	671,496.00	4,994,973.00	537.0	29:50	1,539
CR1-G21-P	Participant	666,766.00	4,991,807.00	577.1	28:59	1,555
CR1-G138-P	Participant	664,809.00	5,006,456.00	549.0	25:18	1,824
CR1-G114-NP	Non-P	666,214.00	5,006,667.00	520.8	23:18	2,205
CR1-G28-P	Participant	673,113.00	4,994,772.00	514.1	22:47	1,614
CR1-G18-P	Participant	668,678.00	4,990,722.00	585.0	22:28	1,585
CR1-G32-P	Participant	669,477.00	4,995,401.00	546.0	19:55	1,545
CR1-G124-P	Participant	669,843.00	5,000,605.00	525.0	19:21	1,791
CR1-G137-P	Participant	666,501.00	5,005,136.00	529.5	18:36	1,939
CR1-G43-NP	Non-P	661,141.00	5,001,721.00	584.2	18:19	1,909
CR1-G66-P	Participant	670,802.00	4,994,681.00	539.8	16:39	1,801
CR1-G125-P	Participant	668,289.00	5,000,643.00	543.0	15:48	1,716
CR1-G128-P	Participant	670,242.00	5,001,314.00	513.0	14:58	2,612
CR1-G25-P	Participant	671,391.00	4,992,858.00	549.0	14:36	1,804
CR1-G59-P	Participant	675,755.00	4,994,888.00	488.3	12:40	2,605
CR1-G149-NP	Non-P	669,284.00	5,003,283.00	503.2	12:39	2,815
CR1-G67-P	Participant	669,597.00	4,993,440.00	555.8	12:03	2,106
CR1-G108-NP	Non-P	669,516.00	5,001,186.00	522.2	11:37	3,586
CR1-G136-P	Participant	667,706.00	5,004,861.00	522.0	10:34	2,277
CR1-G26-NP	Non-P	672,589.00	4,993,869.00	531.0	8:15	3,140
CR1-G135-P	Participant	668,616.00	5,005,161.00	504.2	8:10	2,142
CR1-G139-P	Participant	668,199.00	5,008,062.00	475.9	8:05	2,612
CR1-G115-NP	Non-P	664,933.00	5,006,731.00	544.6	7:58	2,188
CR1-G132-P	Participant	669,098.00	5,004,948.00	501.0	7:38	2,703
CR1-G113-NP	Non-P	666,228.00	5,005,549.00	537.0	7:15	2,746
CR1-G19-P	Participant	671,018.00	4,990,744.00	570.0	5:42	2,077
CR1-G60-P	Participant	675,830.00	4,995,687.00	477.0	5:42	3,343
CR1-G23-NP	Non-P	670,471.00	4,992,104.00	560.1	5:16	2,185
CR1-G33-P	Participant	668,911.00	4,995,550.00	548.7	4:00	2,779
CR1-G133-P	Participant	669,881.00	5,005,460.00	478.8	3:26	3,556
CR1-G126-P	Participant	672,157.00	5,000,446.00	484.3	3:21	3,176
CR1-G27-NP	Non-P	676,630.00	4,994,642.00	480.8	2:54	4,944
CR1-G44-NP	Non-P	661,781.00	5,001,732.00	583.7	2:49	3,123
CR1-G129-P	Participant	673,111.00	4,997,703.00	477.8	2:27	4,153
CR1-G127-P	Participant	669,534.00	4,999,939.00	533.9	2:23	3,369
CR1-G68-NP	Non-P	669,159.00	4,993,632.00	564.7	2:09	2,113
CR1-G117-NP	Non-P	663,801.00	5,005,084.00	581.3	1:54	4,501
CR1-G131-P	Participant	668,466.00	5,005,145.00	505.1	1:31	2,133

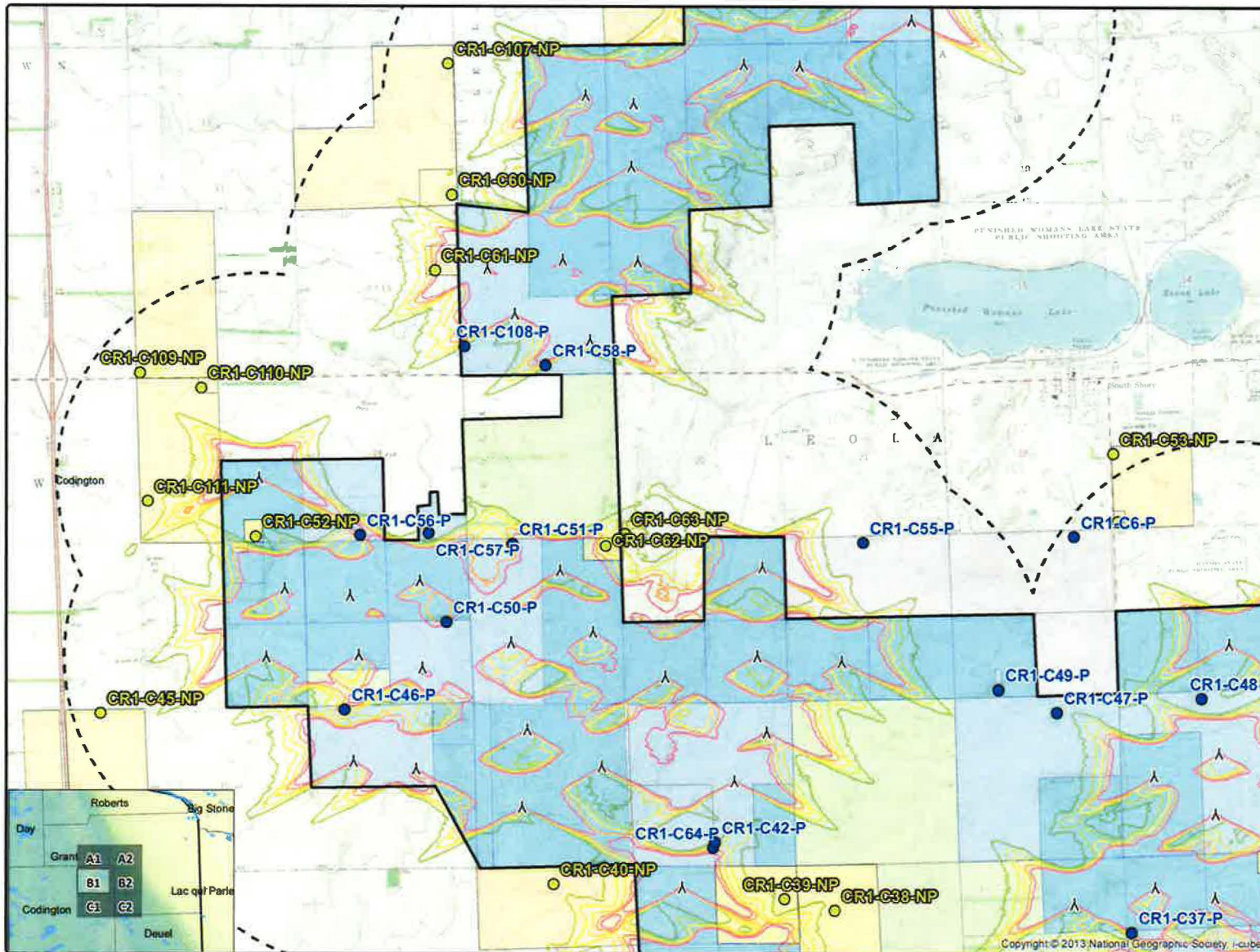
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APPENDIX D: STANDARD RESOLUTION SHADOW FLICKER MAPS











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**Crowned Ridge Wind Farm
Shadow Flicker Iso-Lines**

Client
SWCA Environmental Consultants

Project Description
Wind turbine layout with occupied structures within 2 km.

Predicted shadow flicker levels at existing residences.

Location: Watertown, SD
Project #: 20174431

Issue Dates

1	Original	2019.02.15
#	Description	Date

Drawn By: AS Checked By: JH

Legend

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

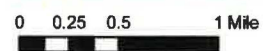
Shadow Flicker (hr/yr)

- 10
- 15
- 20
- 25
- 30

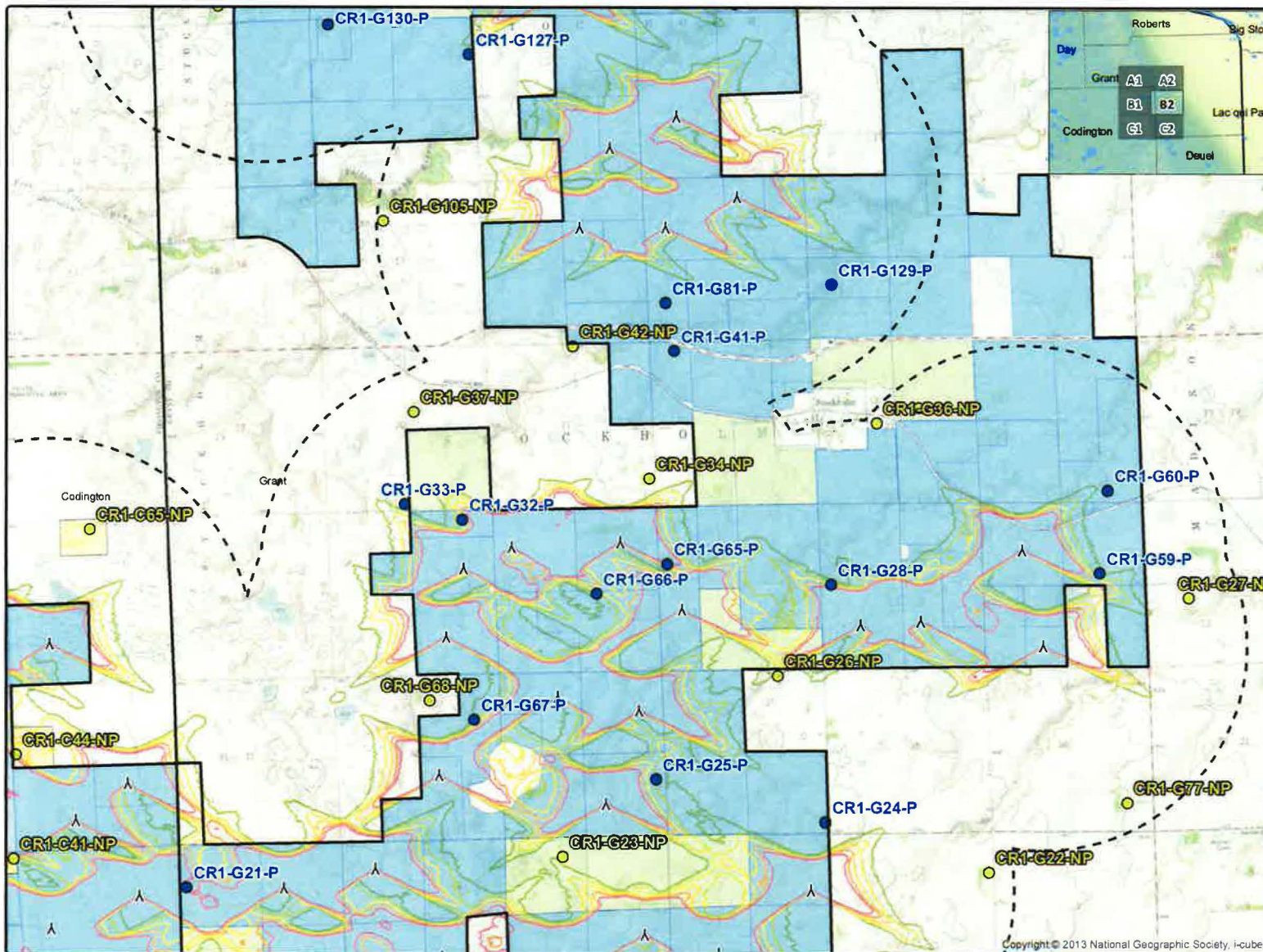
Participating Codington Parcels
Non-Part. Codington Parcels
Participating Land Parcels
Non-Participating Land Parcels

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Crowned Ridge Wind Farm Shadow Flicker Iso-Lines

Client
SWCA Environmental Consultants

Project Description
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Project #: 20174431

Issue Dates

1	Original	2019.02.15
#	Description	Date
Drawn By:	AS	Checked By: JH

Legend

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

Shadow Flicker (hr/yr)

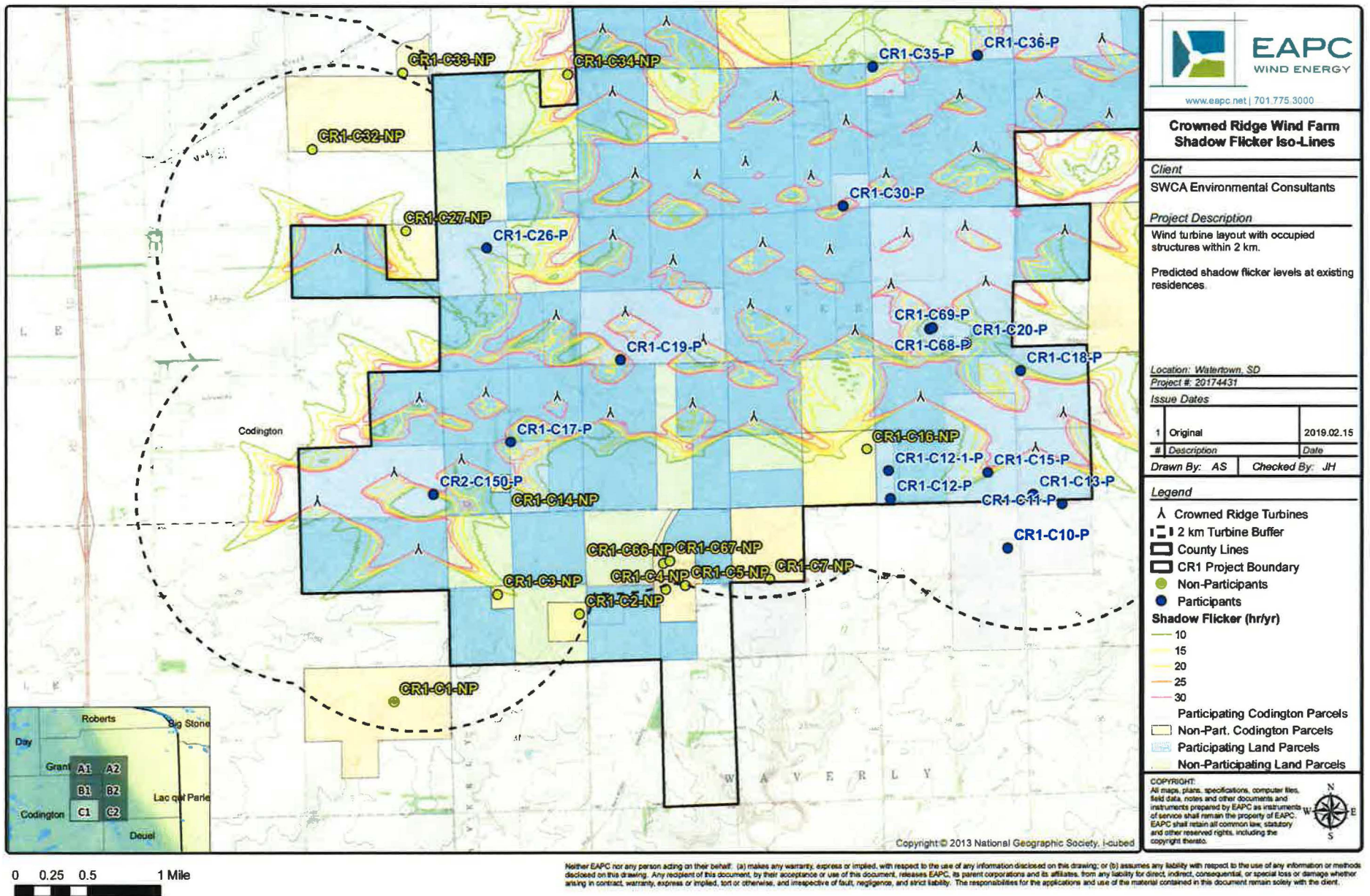
- 10
- 15
- 20
- 25
- 30

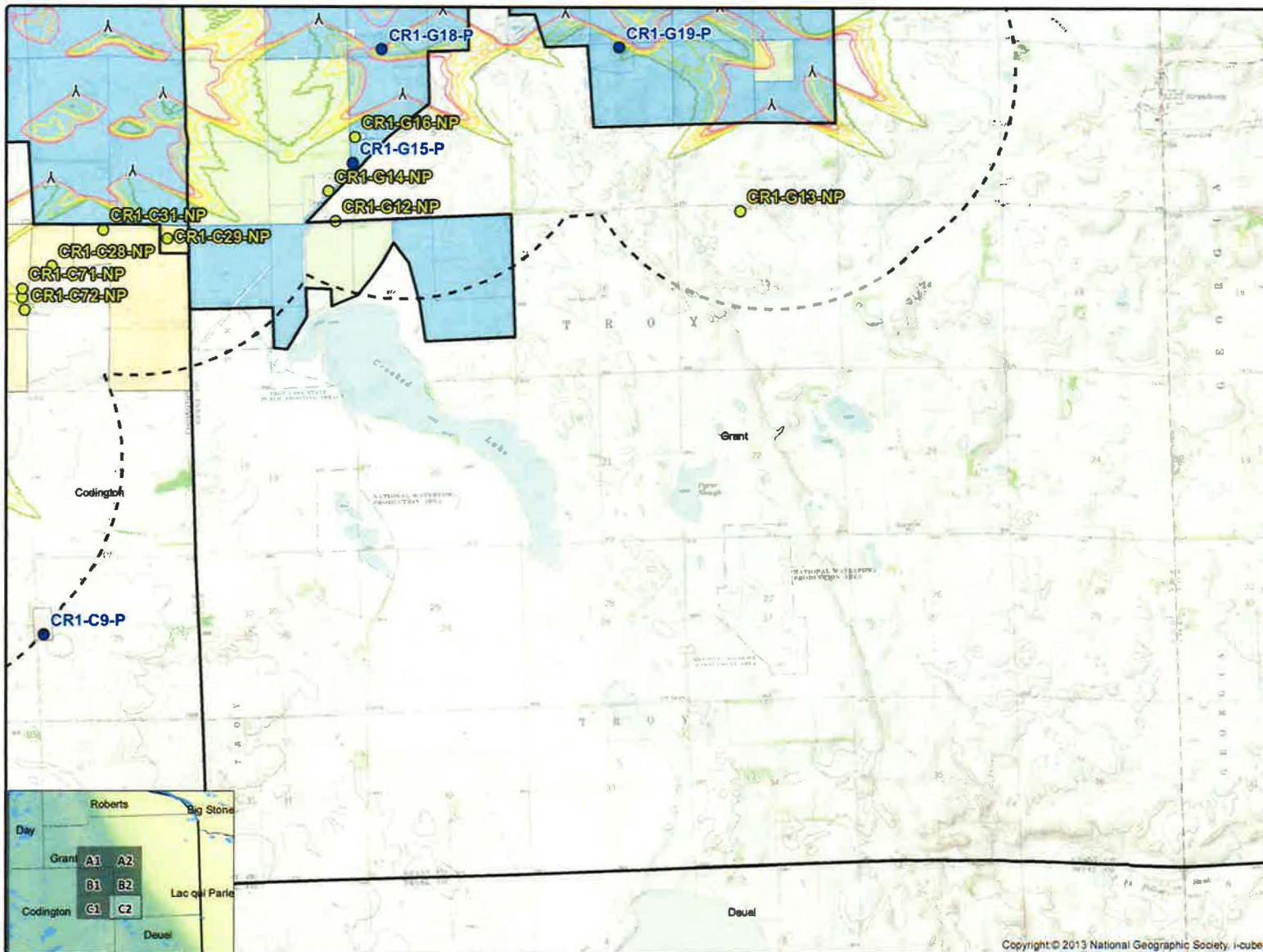
- Participating Codington Parcels
- Non-Part. Codington Parcels
- Participating Land Parcels
- Non-Participating Land Parcels

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0 0.25 0.5 1 Mile

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Crowned Ridge Wind Farm Shadow Flicker Iso-Lines

Client
SWCA Environmental Consultants

Project Description
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Predicted shadow flicker levels at existing residences.

Location: Watertown, SD
Project #: 20174431

Issue Dates

#	Description	Date
1	Original	2019.02.15

Drawn By: AS **Checked By:** JH

Legend

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

Shadow Flicker (hr/yr)

- 10
- 15
- 20
- 25
- 30

Participating Codington Parcels

- Non-Part. Codington Parcels
- Participating Land Parcels
- Non-Participating Land Parcels

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0 0.25 0.5 1 Mile

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Energy Assessment | Wind Farm Design | Feasibility Studies | Due Diligence | Measurement Systems

3100 Demers Avenue, Grand Forks ND 58201 | TELE 701.775.3000 | FAX 701.772.3605

February 26, 2019

Tyler Wilhelm
Project Manager
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, FL 33408
Office: (561) 694-3193
Tyler.Wilhelm@nee.com

Subject: Crowned Ridge participation status changes

Dear Mr. Wilhelm,

This letter is intended to provide updated landowner participation status information that was not included in the original report titled: "Final Report, Crowned Ridge Wind Farm Shadow Flicker Study, Codington and Grant Counties, SD", dated February 6, 2019, submitted by EAPC Wind Energy.

After the report was submitted, I was made aware of updated land parcel and farmstead status databases. There were a number of changes in landowner participation status from the original report. Most were changed from non-participating to participating, with a few that changed from participating to non-participating.

The following receptors were changed from non-participating to participating.

Receptors with Participation Status Change			
Receptor	First Name	Last Name	Shadow (hr/yr)
CR1-G81-P	Nelson E	Ransom	0:00
CR1-G125-P	Dalton H & Barbara J	Rude	15:48
CR1-G126-P	Marilyn R	Stemsrud	3:21
CR1-G127-P	Henry C & Betty Lou	Erickson	2:23
CR1-G128-P	Ronald & Mindy	Marko	14:58
CR1-G129-P	Dennis M & Deloris D	Redeen	2:27
CR1-G130-P	Dalton H & Barbara J	Rude	0:00
CR1-G131-P	Richard	Hansen	1:31
CR1-G132-P	Eric	Hansen	7:38
CR1-G133-P	Laverna	Moldenhauer	3:26
CR1-G135-P	Richard	Hansen	8:10
CR1-G136-P	Duane	Fish	10:34
CR1-G137-P	Richard	Fish	18:36
CR1-G138-P	Harold	Capp	25:18
CR1-G139-P	Donald	Haacke	8:05

There were no changes in shadow flicker results or compliance with Codington or Grant County requirements for shadow flicker limits.



Norwich VT

Buenos Aires ARG

Fargo ND

Bismarck ND

Minot ND

Williston ND

Bemidji MN

The receptors that changed from participating to non-participating were not within the Crowned Ridge project area. They are included in the Crowned Ridge II project.

I have attached updated maps and results tables that reflect the changes in participation status for the shadow flicker receptors.

Sincerely,

A handwritten signature in blue ink that reads "Jay Haley". The signature is cursive and fluid, with the first name "Jay" and last name "Haley" clearly distinguishable.

Jay Haley, P.E., Partner
For EAPC Wind Energy

Attachments:

Appendix A – Crowned Ridge Energy Project Site Overview Map
Appendix B – Wind Turbine Coordinates
Appendix C – Table of Shadow Flicker Results
Appendix D – Standard Resolution Shadow Flicker Maps