



TETRA TECH

September 24, 2013

Mr. Darrell Nitschke
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard Avenue, Department 408
Bismarck, ND 58505

SUBJECT: Thunder Spirit Wind Energy Project, Adams County, ND (Case No. PU-11-601)

Dear Mr. Nitschke,

On behalf of Thunder Spirit Wind, LLC, Tetra Tech is pleased to provide you 11 copies of the following documents as late-filed exhibits in support of the Application for a Certificate of Site Compatibility for the Thunder Spirit Wind Energy Project for filing in Case No. PU-11-601.

- Late-filed Exhibit #1 – Revised figures showing change in status for Receptor #12

Please feel free to contact me at (617) 443-7552 or Tracey.Dubuque@tetrattech.com if you have any questions.

Sincerely,

TETRA TECH, INCORPORATED

Tracey M. Dubuque, P.E.
Senior Project Manager








Figure 1

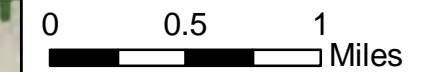
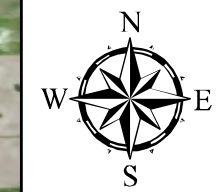
Residential Receptors Modeled
With WindPro to Predict Expected
Shadow Flicker Impacts

Thunder Spirit Wind Energy Project
Thunder Spirit Wind, LLC
Adams County, North Dakota

September 2013

Legend

-  Proposed Turbine Location (8/15/2013)
-  Collector Substation
Construction Footprint (20 Acres)
-  Project Area
- Receptor**
-  Signed Easement (Occupied)
-  Signed Easement (Abandoned)
-  Not Signed (Occupied)
-  Not Signed (Abandoned)



REFERENCE MAP

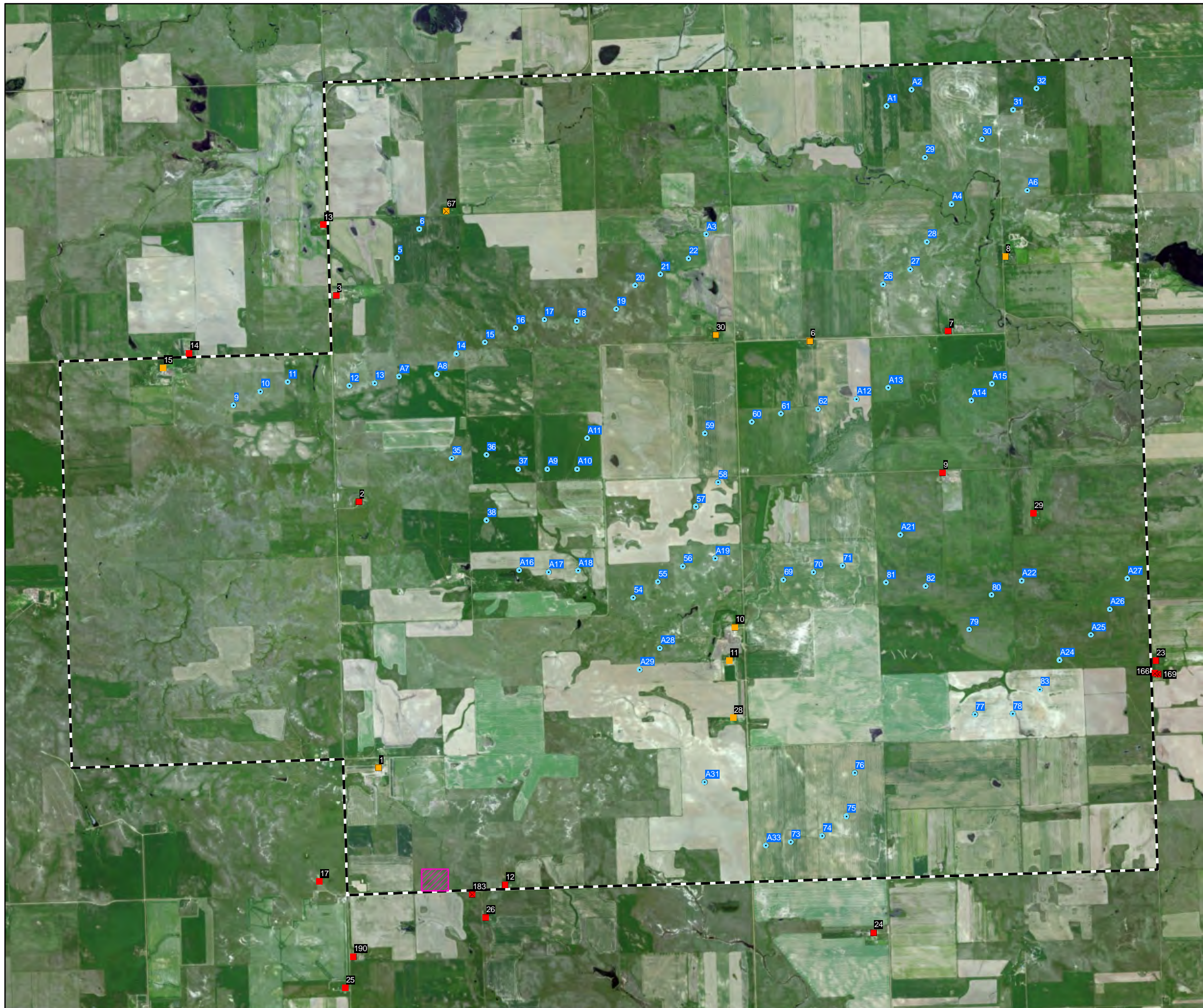
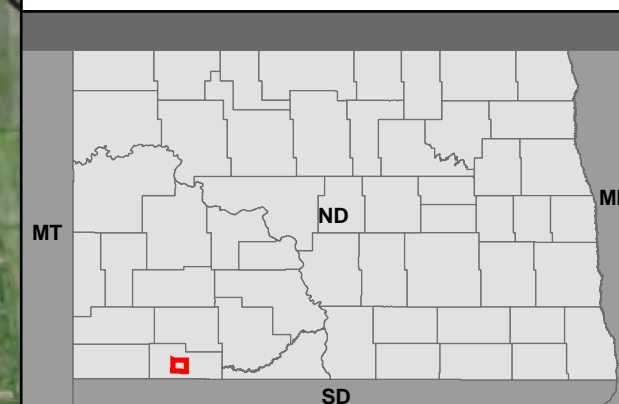














Figure 2A

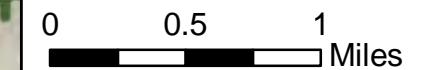
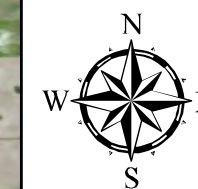
WindPro Predicted Expected
Shadow Flicker Impact Areas:
Vestas Turbines

Thunder Spirit Wind Energy Project
Thunder Spirit Wind, LLC
Adams County, North Dakota

September 2013

Legend

-  Proposed Turbine Location (8/15/2013)
-  Collector Substation
Construction Footprint (20 Acres)
- Shadow Flicker Iso Line (Vestas)**
 -  15 hrs/yr
 -  30 hrs/yr
 -  50 hrs/yr
 -  75 hrs/yr
 -  100 hrs/yr
-  Project Area
- Receptor**
 -  Signed Easement (Occupied)
 -  Signed Easement (Abandoned)
 -  Not Signed (Occupied)
 -  Not Signed (Abandoned)



REFERENCE MAP

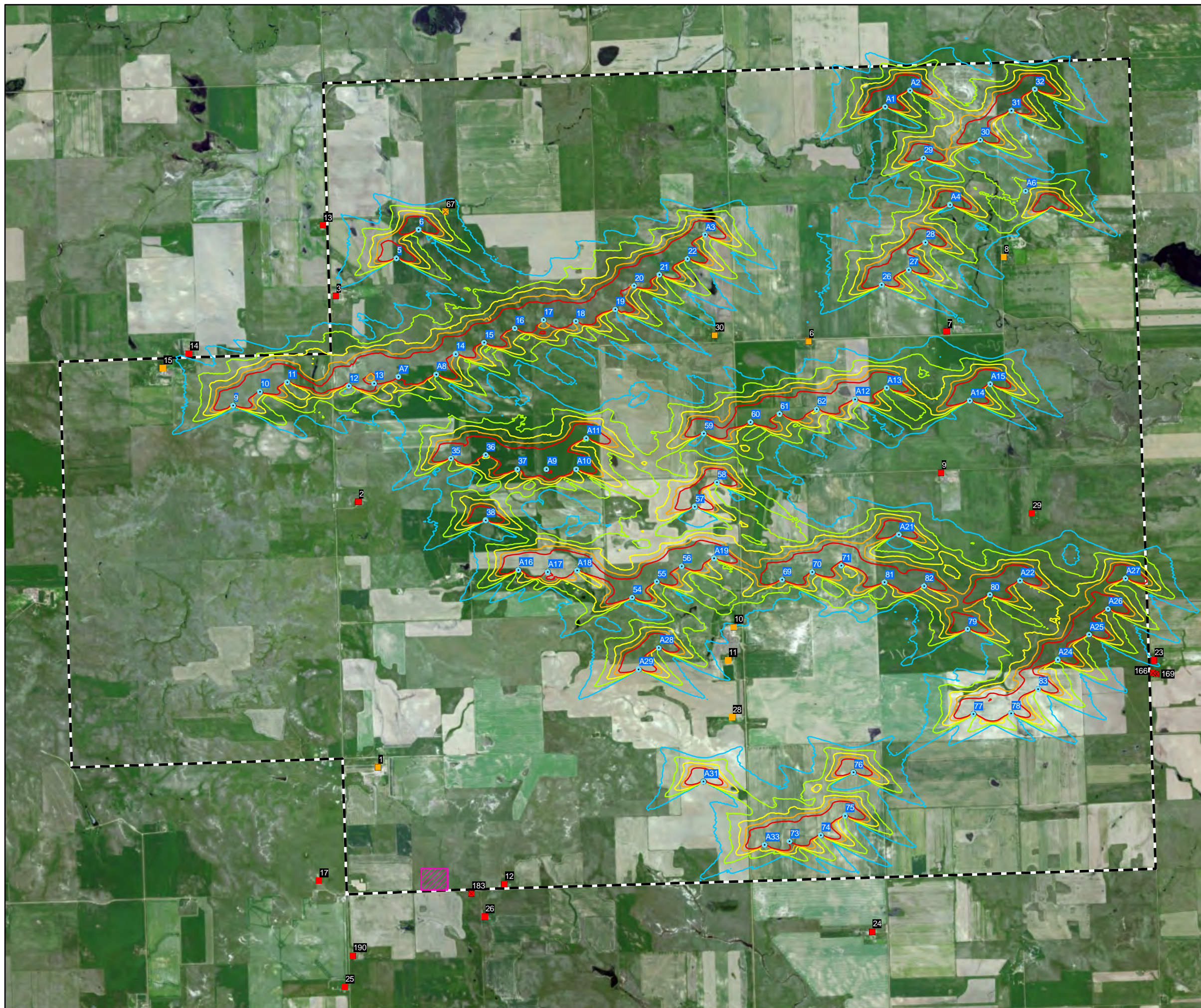
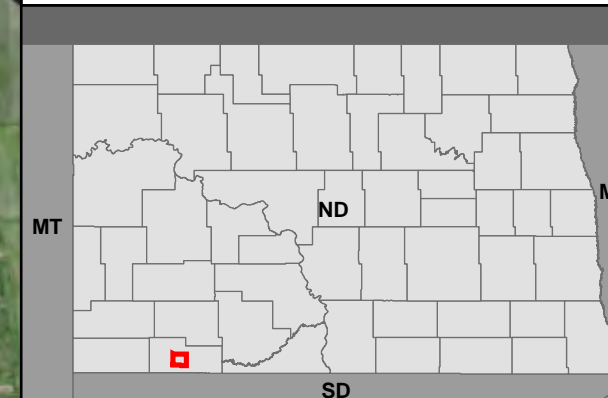














Figure 2B

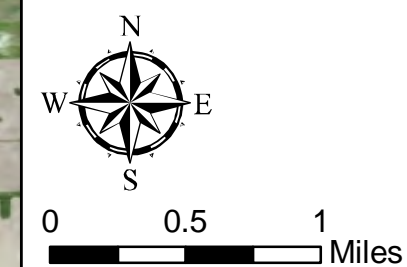
WindPro Predicted Expected
Shadow Flicker Impact Areas:
Siemens Turbines

Thunder Spirit Wind Energy Project
Thunder Spirit Wind, LLC
Adams County, North Dakota

September 2013

Legend

-  Proposed Turbine Location (8/15/2013)
-  Collector Substation
Construction Footprint (20 Acres)
- Shadow Flicker Iso Line (Siemens)**
 -  15 hrs/yr
 -  30 hrs/yr
 -  50 hrs/yr
 -  75 hrs/yr
 -  100 hrs/yr
-  Project Area
- Receptor**
 -  Signed Easement (Occupied)
 -  Signed Easement (Abandoned)
 -  Not Signed (Occupied)
 -  Not Signed (Abandoned)



REFERENCE MAP

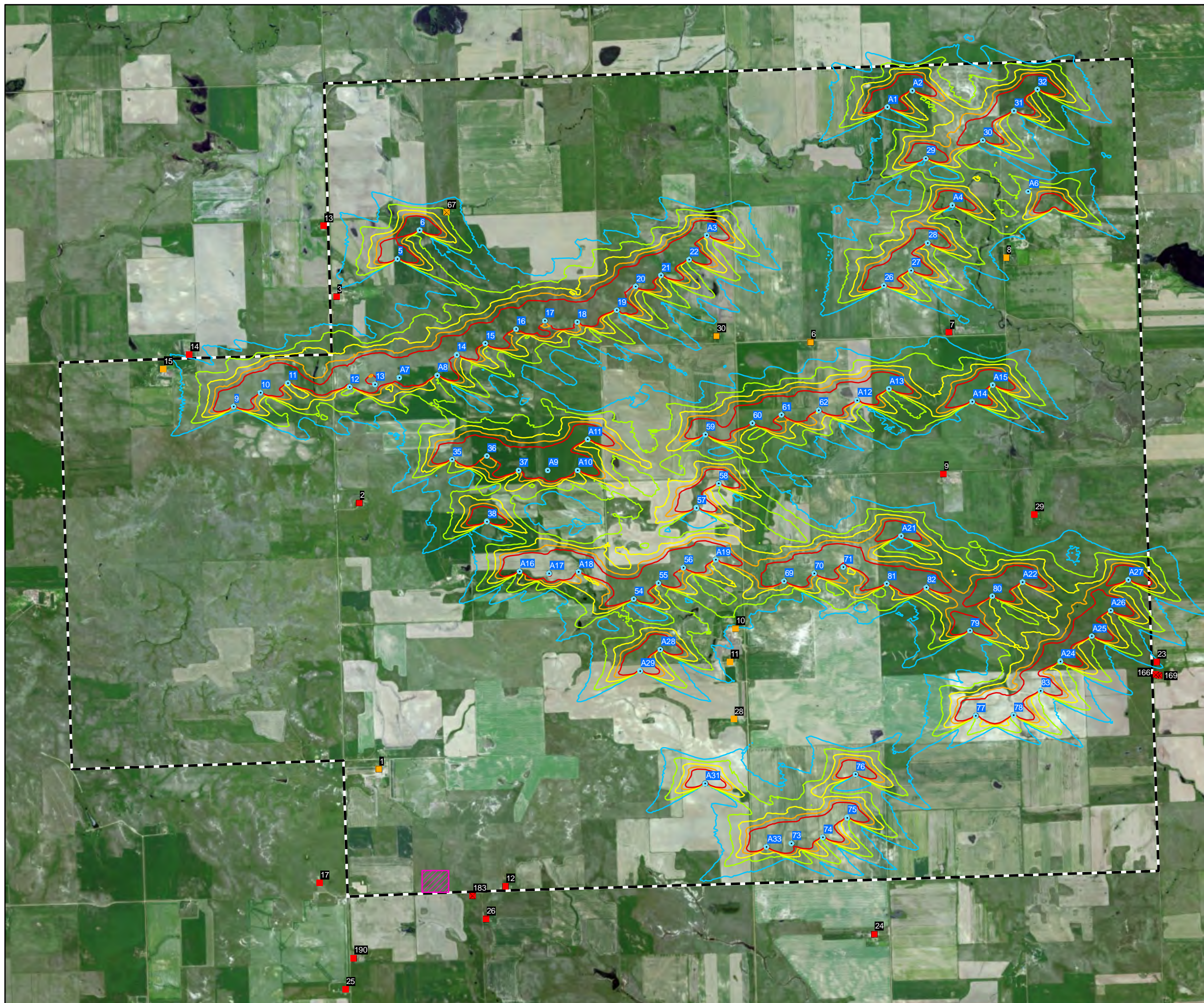
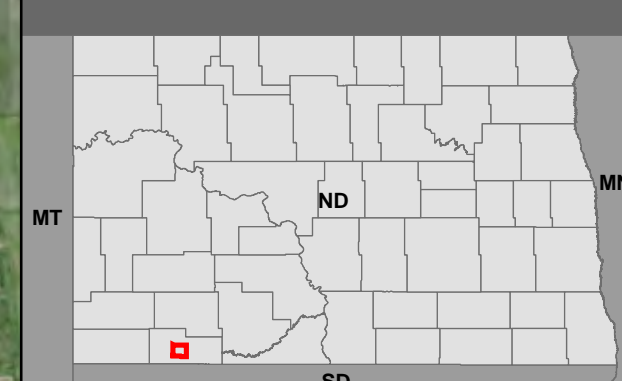














Figure 1

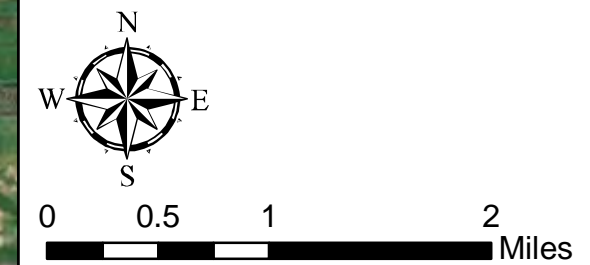
Received Sound Levels:
Acciona AW116/3000 WTG at
Maximum Rotational Wind Speed
under Anomalous Conditions

Thunder Spirit Wind Energy Project
Thunder Spirit Wind, LLC
Adams County, North Dakota

September 2013

Legend

-  Proposed Turbine Location (8/15/2013)
 -  Collector Substation Construction Footprint (20 Acres)
 -  Project Area
- Isopleth Ranges (dBA)**
- | | | | |
|---|---|---|---|
|  |  |  |  |
| 35 - 40 | 40 - 45 | 45 - 50 | 50 - 55 |
-  Isopleth Range Exceeding EPA Guideline (>48.6 dBA)
- Receptor**
-  Signed Easement (Occupied)
 -  Signed Easement (Abandoned)
 -  Not Signed (Occupied)
 -  Not Signed (Abandoned)



REFERENCE MAP

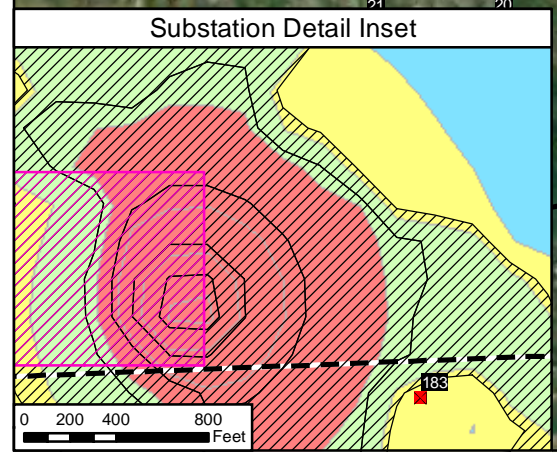
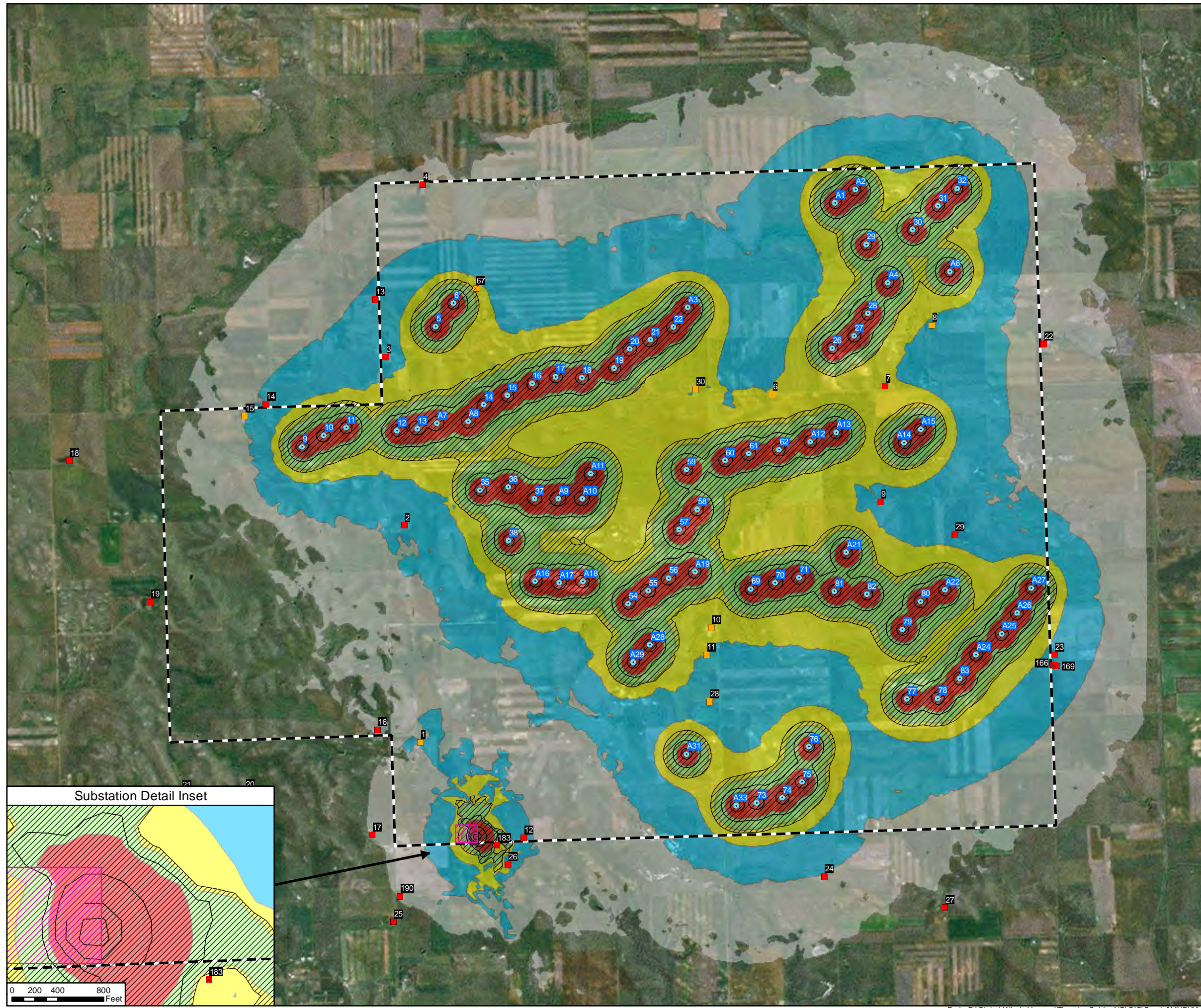
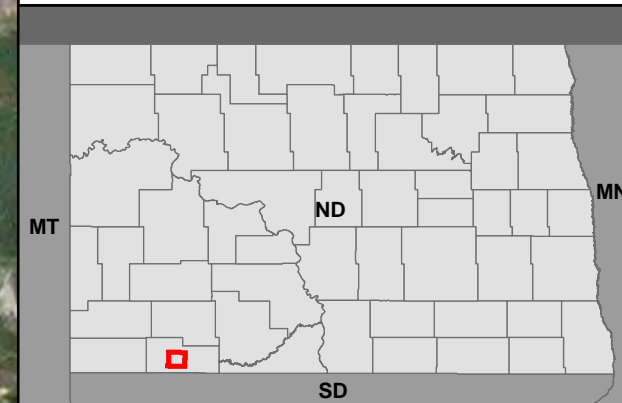















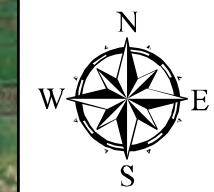
Figure 2

Received Sound Levels:
 Vestas V100-2.0MW WTG at
 Maximum Rotational Wind Speed
 under Anomalous Conditions
 Thunder Spirit Wind Energy Project
 Thunder Spirit Wind, LLC
 Adams County, North Dakota

September 2013

Legend

-  Proposed Turbine Location (8/15/2013)
 -  Collector Substation
 -  Construction Footprint (20 Acres)
 -  Project Area
- Isopleth Ranges (dBA)**
- | | | | |
|--|---|---|---|
|  |  |  |  |
| 35 - 40 | 40 - 45 | 45 - 50 | 50 - 55 |
|  Isopleth Range Exceeding EPA Guideline (>48.6 dBA) | | | |
- Receptor**
-  Signed Easement (Occupied)
 -  Signed Easement (Abandoned)
 -  Not Signed (Occupied)
 -  Not Signed (Abandoned)



REFERENCE MAP

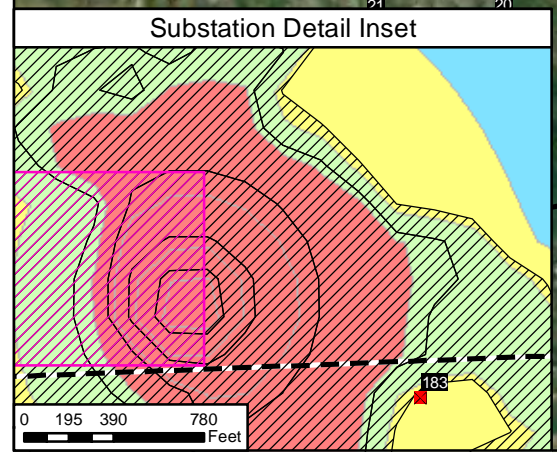
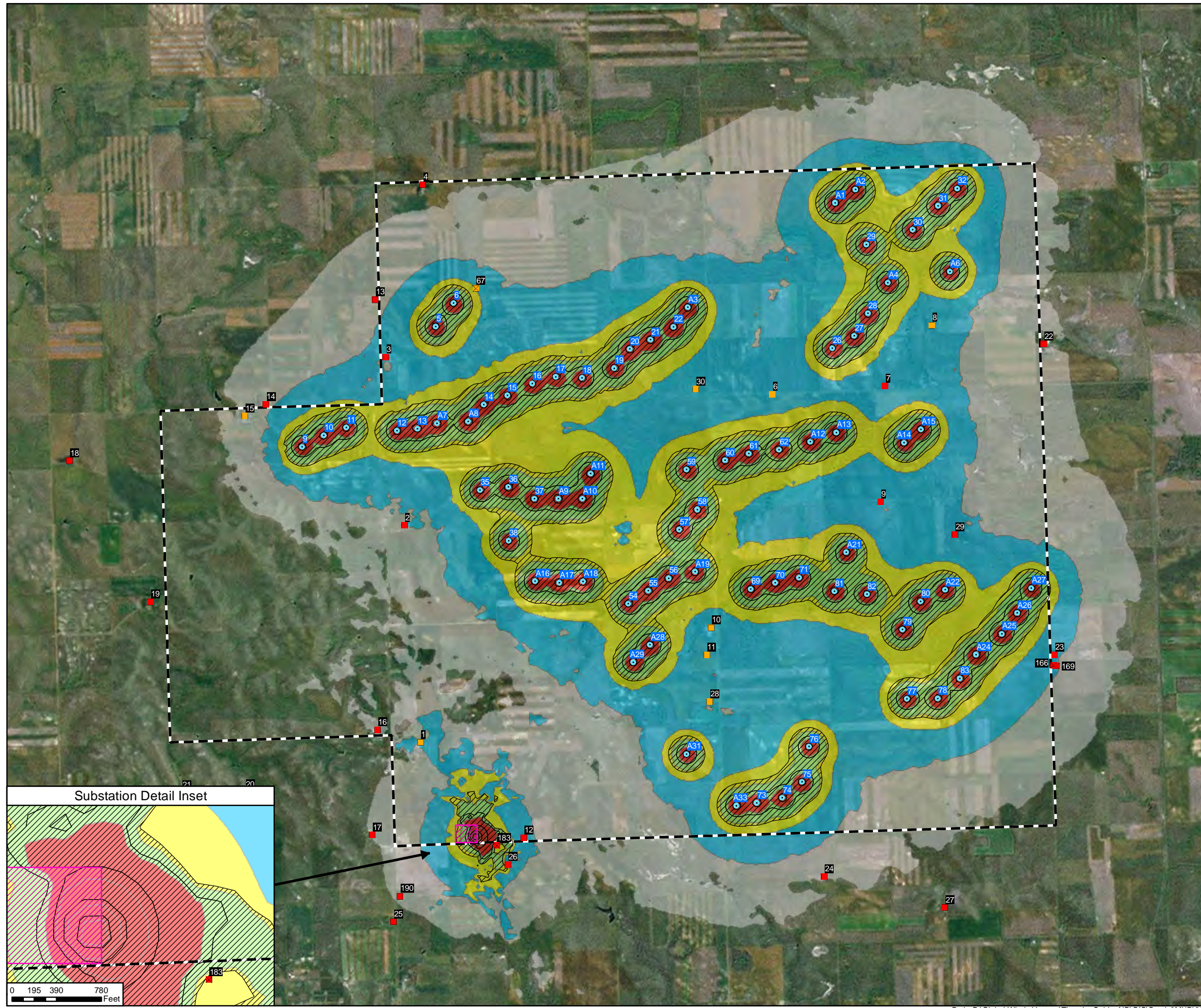
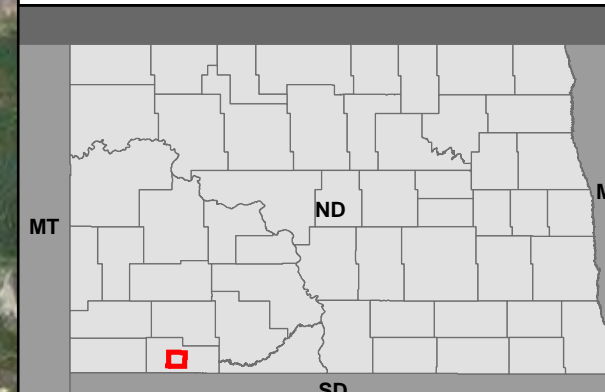















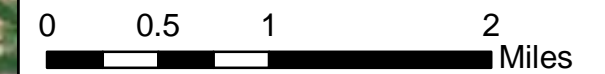
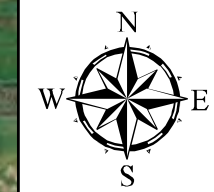
Figure 3

Received Sound Levels:
Siemens 2.3-108 WTG at
Maximum Rotational Wind Speed
under Anomalous Conditions
Thunder Spirit Wind Energy Project
Thunder Spirit Wind, LLC
Adams County, North Dakota

September 2013

Legend

-  Proposed Turbine Location (8/15/2013)
-  Collector Substation Construction Footprint (20 Acres)
-  Project Area
- Isopleth Ranges (dBA)**
 -  35 - 40
 -  40 - 45
 -  45 - 50
 -  50 - 55
 -  > 55
-  Isopleth Range Exceeding EPA Guideline (>48.6 dBA)
- Receptor**
 -  Signed Easement (Occupied)
 -  Signed Easement (Abandoned)
 -  Not Signed (Occupied)
 -  Not Signed (Abandoned)



REFERENCE MAP

