



Executive Summary – Wind Power GeoPlanner™

Licensed Microwave Search & Worst Case Fresnel Zone

Comsearch performed an analysis to evaluate the potential effects of the planned Valley City Wind project in Barnes County, ND on existing non-Federal Government microwave telecom systems.

Microwave Search Results: Comsearch’s Wind Power GeoPlanner™ provides a graphical representation of affected microwave paths and provides supporting technical parameters. The microwave path data is overlaid on topographic basemaps. Comsearch identified 20 microwave paths that intersect the project area (see Figure 1 and Table 1 below).

Comsearch then calculated a Worst Case Fresnel Zone (WCFZ) for each microwave path in the project area. The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones are calculated for each path using the following formula.

$$R_n \cong 17.3 \sqrt{\frac{n}{FGHz} \left(\frac{d_1 d_2}{d_1 + d_2} \right)}$$

Where,

R_n = First Fresnel Zone Radius, meters

n = The Number 1

FGHz = Frequency of Microwave Link, GHz

d₁ = Distance to Wind Turbine from Microwave Station 1, km

d₂ = Distance to Wind Turbine from Microwave Station 2, km

note: For WCFZ calculation d₁ = d₂

The calculated WCFZ radius, giving the linear path an area or swath, buffers each microwave path in the project area. The distance unit is in meters and can be found in the column attribute “WCFZ.” In general, this is the XY area where the planned wind turbines should be avoided, if possible. These areas are shown in Figure 2.

Please note that because the turbine locations were not provided, we could not determine if any potential obstruction cases exist between the planned wind turbines and the microwave systems. If the latitude and longitude values for turbine locations are provided, Comsearch can identify specific microwave telecom paths and turbines where a potential XY conflict exists. Additionally, when wind turbines need to be located inside a WCFZ, Comsearch can provide a detailed clearance study, which considers the vertical Z-height clearance objectives.



**Snyder & Associates, Inc.
Valley City Wind**

Map Projection: The ESRI® Shapefiles contained in the enclosed GeoPlanner CD are in NAD 83 UTM Zone 14 projected coordinate system.

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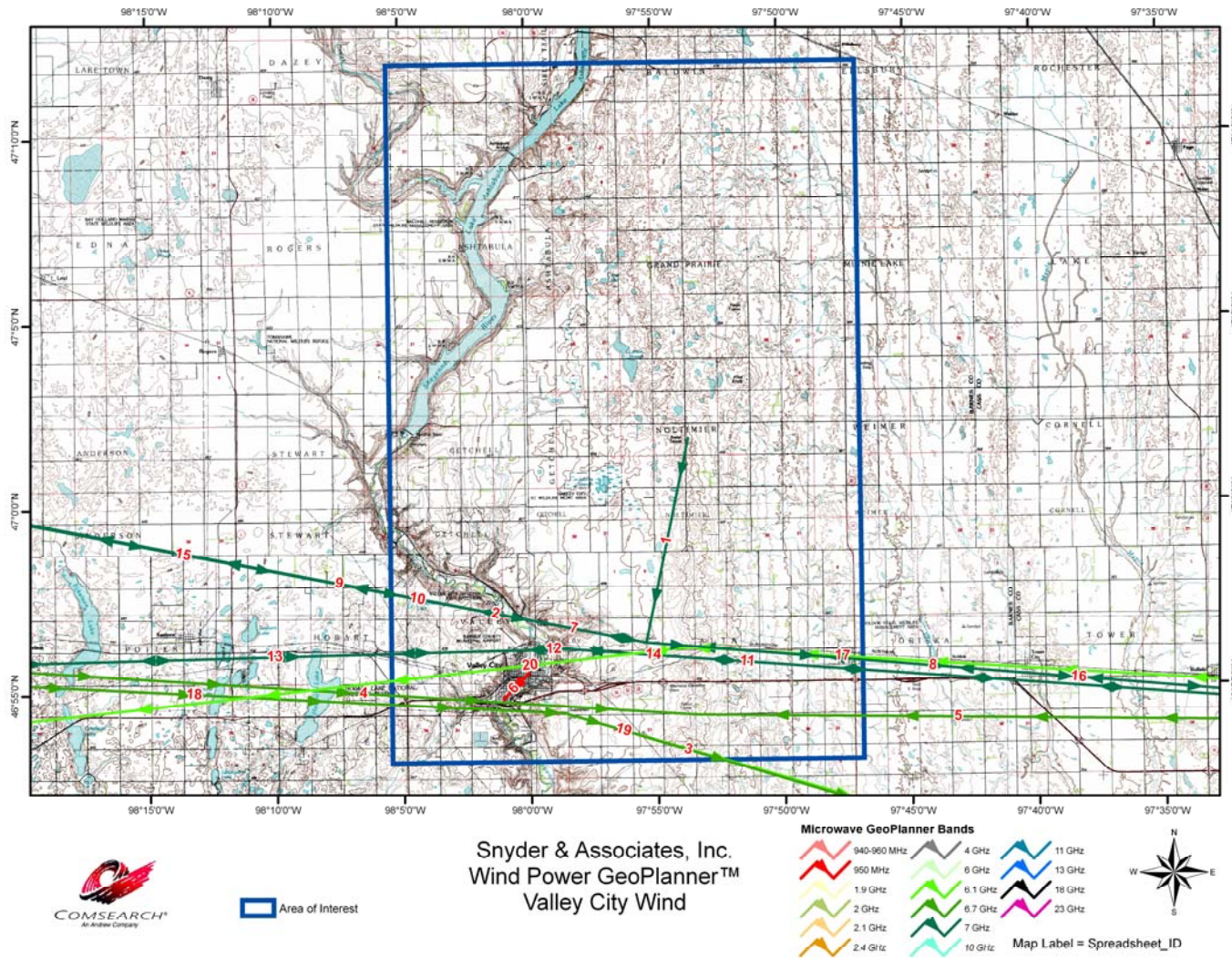
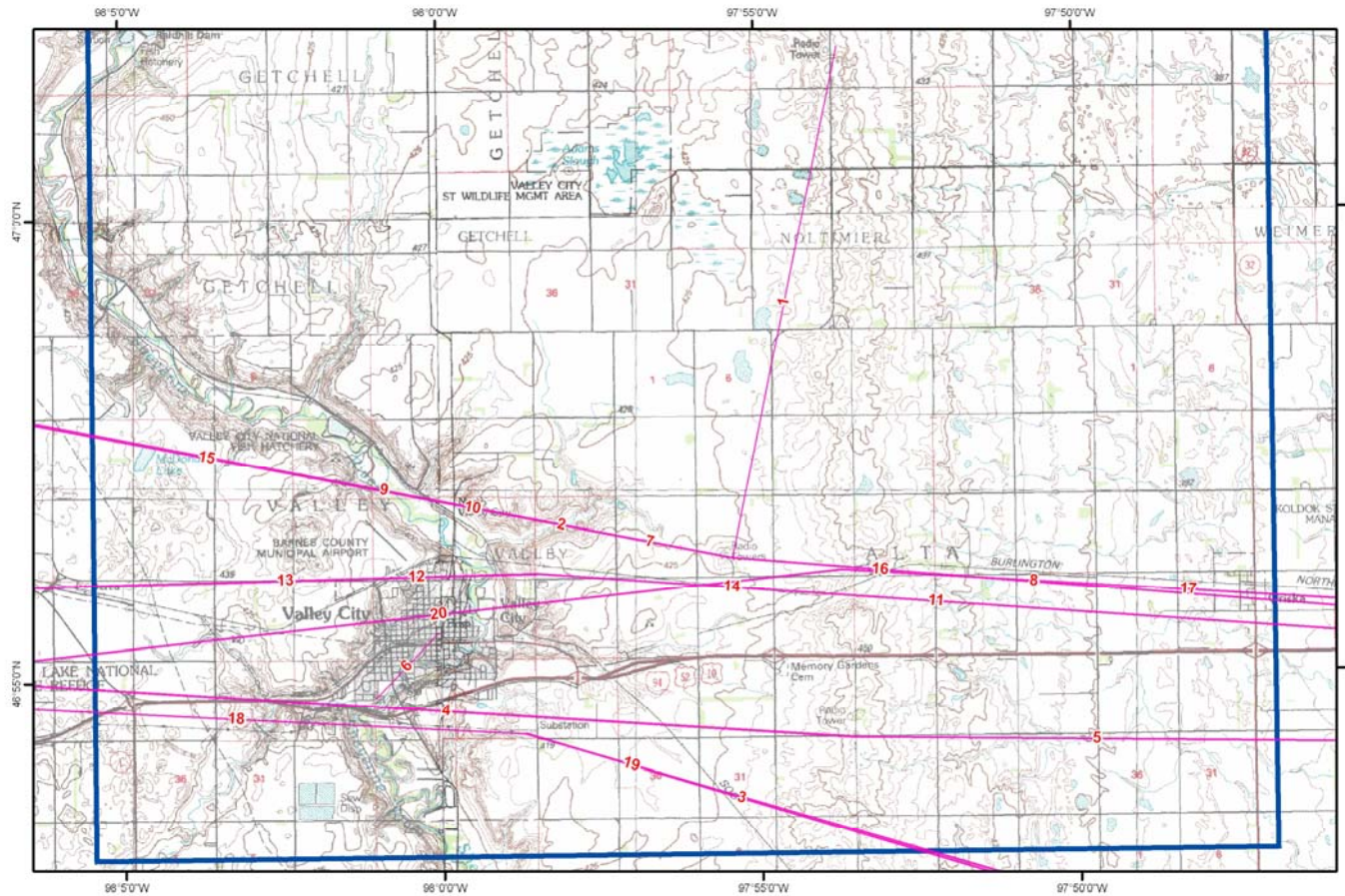


Figure 1 – Wind Power GeoPlanner™



Snyder & Associates, Inc.
Wind Power GeoPlanner™
Valley City Wind

WCFZ
Area of Interest



Map Label = Spreadsheet_ID

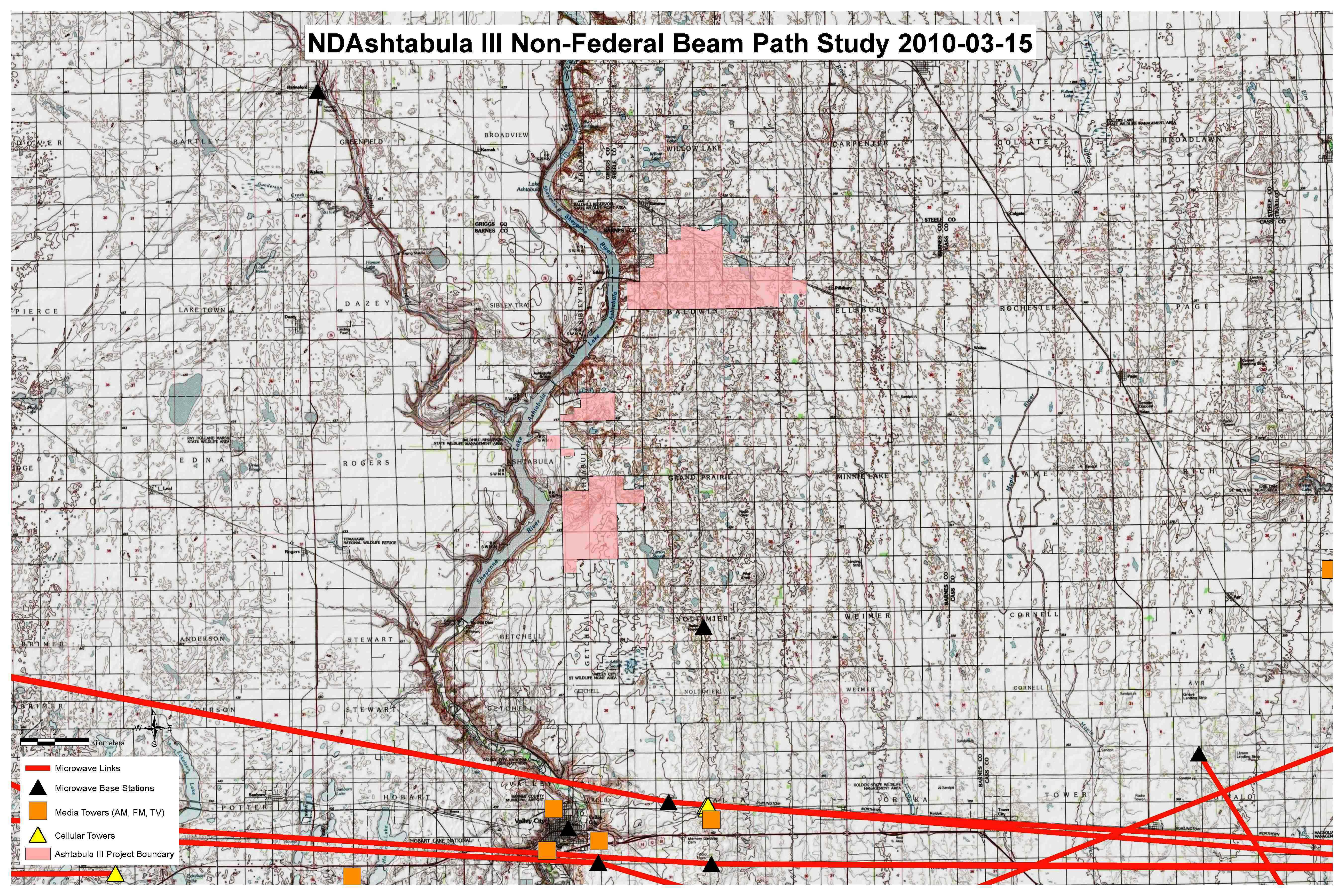
Figure 2 – Wind Power GeoPlanner™ & WCFZ


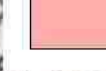


ID	Name Site 1	Name Site 2	Call Sign Site 1	Call Sign Site 2	BAND NAME	Licensee	WCFZ (m)
1	PEAK	VALLEY CITY	KAZ80	RXONLY	7 GHz	South Dakota Television, Inc	10.56
2	BARNES	CLEMENTSVILL	KBD40	RXONLY	7 GHz	HOAK MEDIA OF DAKOTA LICENSE, LLC	22.41
3	VALLEY CITY	CHAFFEE	KHP73	KIL52	Upper 6 GHz	MINNKOTA POWER COOPERATIVE INC	23.64
4	SPIRITWOOD	VALLEY CITY	KVY52	KVY71	Upper 6 GHz	BNSF Railway Company	22.46
5	WHEATLAND	VALLEY CITY	KVY70	KVY71	Upper 6 GHz	BNSF Railway Company	20.67
6	232 3RD ST	VALLEY CITY	WHM990	RXONLY	950 MHz	SIOUX VALLEY BROADCASTING, INC	11.96
7	VALLEY CITY	CLEMENTSVILL	WLD483	RXONLY	7 GHz	KBMY KMCY LLC (KBMY)	22.41
8	CASSELTON	VALLEY CITY	WLD484	RXONLY	7 GHz	KBMY KMCY LLC (KBMY)	23.13
9	BARNES	CLEMENTSVILL	WLF687	RXONLY	7 GHz	HOAK MEDIA OF DAKOTA LICENSE, LLC	22.41
10	STUTSMAN	VALLEY CITY	WLF690	RXONLY	7 GHz	HOAK MEDIA OF DAKOTA LICENSE, LLC	22.41
11	CASSELTON	VALLEY CITY	WLI369	RXONLY	7 GHz	RED RIVER BROADCAST CO., LLC	22.66
12	VALLEY CITY	JAMESTOWN	WLI370	RXONLY	7 GHz	RED RIVER BROADCAST CO., LLC	25.48
13	JAMESTOWN	VALLEY CITY	WLI701	RXONLY	7 GHz	RED RIVER BROADCAST CO., LLC	25.48
14	VALLEY CITY	CASSELTON	WLI705	RXONLY	7 GHz	RED RIVER BROADCAST CO., LLC	22.66
15	CLEMENTSVILL	VALLEY CITY	WPNF720	RXONLY	7 GHz	KBMY KMCY LLC (KBMY)	22.41
16	VALLEY CITY	CASSELTON	WPNF863	RXONLY	7 GHz	KBMY KMCY LLC (KBMY)	23.13
17	CASSELTON	VAL CITY MW	WPON209	WPYS527	Lower 6 GHz	WWC Holding Co., Inc	23.75
18	ECK MPC	VALLEY CITY	WPQS894	WPQS895	Upper 6 GHz	MINNKOTA POWER COOPERATIVE INC	17.37
19	VALLEY CITY	CHAFFEE	WPQS895	WPQS386	Lower 6 GHz	MINNKOTA POWER COOPERATIVE INC	24.70
20	VAL CITY MW	SANBORN	WPYS527	WPON204	Lower 6 GHz	WWC Holding Co., Inc	20.51

Table 1 – Microwave GeoPlanner Links Considered in Analysis
(See enclosed mw_geopl.xls for more detailed information and GP_dict_matrix_description.xls for field description)

NDAshtabula III Non-Federal Beam Path Study 2010-03-15



-  Microwave Links
-  Microwave Base Stations
-  Media Towers (AM, FM, TV)
-  Cellular Towers
-  Ashtabula III Project Boundary