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Xcel Energy

Docket No.: OAH 15-2500-20599-2
PUC No. E-002/TL-09-38

Response To: City of Minneapolis Information Request No. 15

Date Received: December 29, 2009

Question:

Provide architectural and design specifications for each of the proposed substations, in each location, including those for alternate locations not outlined in the Application, that have been discussed formally, or informally, with any party. This includes heights and compositions of wall, depth of substation, and whether the Applicant intends to place some part of the substation underground level.

Response:

Architectural specifications have not been developed for any of the proposed substation sites. However, as part of the Draft Environmental Impact Statement (DEIS) process, photo renderings were produced for the preferred substation sites (Midtown North and Hiawatha West) that show architectural walls around the sites. Copies of those photo renditions were attached as Attachment 1 to the response of Northern States Power Company, a Minnesota corporation (Xcel Energy), to the City of Minneapolis Information Request No. 14.

The ultimate design of the substations is dependent upon the final site selected for the substations for the Hiawatha 115 kV Transmission Line Project (Project). General design requirements for the substations remain the same regardless of the site location. The general design requirements for substation equipment are defined as follows:

Hiawatha Substation:

- Four 115 kV transmission line terminations and related substation equipment and structures
- Sufficient space for three 50 MVA distribution transformers (initially one unit, ultimate design is three units)
- Metalclad switchgear enclosure(s)
- One electrical equipment enclosure

Midtown Substation:

- Two 115 kV transmission lines and related substation equipment and structures
- Sufficient space for two 70 MVA distribution transformers (initially one unit, ultimate design is two units)
- 15 kV switchgear enclosure or outdoor feeder bays

- One electrical equipment enclosure

In addition to these equipment requirements, each substation site must be able to accommodate transmission and distribution interconnections.

Xcel Energy analyzed the suitability of 13 sites based on these requirements and evaluated whether each site was technically feasible; technically feasible but not reasonable or prudent; or technically infeasible. The analysis assumed the substation would be at ground level and that foundations, grounding, and equipment control cables would be the only items below grade.

A summary of Xcel Energy's current analysis of each substation appears below. A consolidated chart showing Xcel Energy's conclusion about the technical suitability of each site is provided at the end of this response.

Midtown North (MT-1) - Preferred

Addresses: 2840 Oakland Avenue, 2833 Portland Avenue, and 2841 Portland Avenue.

The Midtown North substation site is located on the northwest corner of Oakland Avenue South and 29th Street. Currently, the site is occupied by the former Oakland Substation, a condemned triplex, and a vacant lot. The substation would be designed as a high profile substation covering a footprint (fenced area) of approximately 145 feet by 228 feet, or approximately 0.8 acres as shown in the top view rendition attached as **Attachment 1** (NH-992269-18).

Although no architectural design has been done for this site, photo renderings of this substation prepared for the DEIS depicted walls approximately 20 feet high.

This site meets the Project requirements and is technically feasible and reasonable.

Midtown South (MT-2) – Proposed Alternative

Addresses: 2907 Portland Avenue and 2915 Portland Avenue

The Midtown South substation site is located on the southwest corner of Oakland Avenue South and 29th Street. The site is currently developed as a warehouse occupied by Brown Campbell. The warehouse would need to be demolished and the tenant relocated prior to construction of the substation. The substation would be designed as a low profile substation covering a footprint (fenced area) of approximately 211 feet by 225 feet, or approximately 1.1 acres. A top view of the design is attached as **Attachment 2** (NH-992269-17).

This site meets the Project requirements and is technically feasible and reasonable.

MT-28S

Address: 2840 4th Avenue South

Proposed by the Advisory Task Force, this site is located on a vacant property on the east side of Interstate 35W, bordered to the north by East 28th Street and to the south by East 29th Street. The MT-28S Substation would be located four blocks west of the proposed Midtown North and Midtown South substation sites, and would require the extension of routes A, B, C, and D to MT-28S. The site is currently being used as a shuttle parking lot for Children's Hospital. The site is large enough for either the low or high profile substation design. A top view of the designs are attached as **Attachment 1** (NH-992269-18) and **Attachment 3** (NH-99P2269-14).

The height and composition of any substation wall is undefined at this time. As discussed in Xcel Energy's response to Midtown Greenway Coalition Information Request 25, the wall would be designed to prevent/mitigate road salt contamination of the electrical facilities.

This site is technically feasible, but not a reasonable and prudent alternative.

MT- 28N

Proposed by the Advisory Task Force, this site is located at 2701 Wells Fargo Way on the east side of Interstate 35W on private green space owned by Wells Fargo. This site is located four blocks west of the Midtown North and South substation sites and would require the extension of routes A, B, C and D to MT-28N. Distribution circuit access would be restricted due to the close proximity of this site to Interstate 35W and buildings on the Wells Fargo campus. Therefore, this site is less likely to be technically feasible and it is not a recommended location. A top view of the design is attached as **Attachment 1** (NH-992269-18) and **Attachment 3** (NH-99P2269-14).

The height and composition of any substation walls is undefined at this time. As discussed in Xcel Energy's response to Midtown Greenway Coalition Information Request 25, the wall would be designed to prevent/mitigate road salt contamination of the electrical facilities.

Based on the analysis to date, this site may be technically feasible, but it is not a reasonable and prudent alternative.

MT- 28W

Address: 2840 4th Avenue South

This alternate location was not outlined in the Route Permit Application. It is located on the west side of Interstate 35W, just south of 28th Street. This site is currently a City of Minneapolis park. Poor accessibility to transmission and distribution circuits make this a less technically feasible site and therefore it is not a recommended location. A top view of the design is attached as **Attachment 4** (NH-99P2269-21).

Based on the analysis to date, this site may be technically feasible, but it is not a reasonable and prudent alternative.

Hiawatha West – Preferred site

The Hiawatha West site is located to the east of Hiawatha Avenue (Minnesota State Highway 55) slightly south of the intersection of Hiawatha Avenue and East 28th Street. The site consists of a vacant lot currently owned by the Minnesota Department of Transportation (Mn/DOT). The substation would be designed as a low-profile substation covering a footprint (fenced area) of 219 feet by 409 feet, or approximately 2.1 acres. A top view of the design is attached as **Attachment 5** (10994953-LOC5).

Although no architectural design has been done for this site, photo renderings of this substation prepared for the Draft Environmental Impact Statement showed walls 12 feet high.

The substation is proposed at ground level. Foundations, grounding, and equipment control cables would be the only items below grade. No plans exist to place any part of the substation underground. An underground substation option was studied by an outside consultant for this site. The results of that study are included in the DEIS.

This site meets the Project requirements and is technically feasible and reasonable.

Hiawatha East (HIA-E)– Proposed Alternative

The Hiawatha East site is located on land adjacent to the northeast of Hiawatha West. Currently, the site is developed and has an occupied warehouse that would need to be demolished and its tenants relocated. The substation would be designed as a low-profile substation covering a footprint (fenced area) of approximately 371 feet by 481 feet, or approximately 4.1 acres. A top view of the design is attached as **Attachment 6** (NH-99P2266-16-B-1).

The substation is proposed at ground level. Foundations, grounding, and equipment control cables would be the only items below grade. No plans exist to place any part of the substation underground. However, an underground substation option was studied by an outside consultant for the Hiawatha Substation at the Hiawatha West location for the DEIS process. The results of that study are included in the DEIS.

This site meets the Project requirements and is technically feasible and reasonable.

Hiawatha Zimmer Davis (HIA-ZD) – Applicant Proposed Alternative

Address: 2700 Minnehaha Avenue (Zimmer Davis property)

The Zimmer Davis property is located to the east of the preferred Hiawatha Substation site. This site is developed and has a warehouse that would need to be demolished. The facility appears to be unutilized. The substation would be designed as a low-profile substation. A top view of the design is attached as **Attachment 7** (NH-99P2266-16D).

This site meets the Project requirements and is technically feasible and reasonable.

Hiawatha G1 (HIA-G1)

Address: 2600 Minnehaha Avenue

This site is currently vacant land located near East 26th Street and Minnehaha Avenue. This site is very small but may have sufficient space for the required substation facilities using a high-profile design with a modified low voltage side design, although the setback requirements specific to this site have not been fully investigated. This site will likely require the same setbacks as applied to other properties along Minnehaha Avenue and East 26th Street and constructible space may be insufficient. A top view of the design is attached as **Attachment 8** (NH-99P226-25).

This site is technically feasible but not prudent and reasonable.

Hiawatha G2 (HIA-G2)

Addresses: 2843 20th Avenue South, 2845 20th Avenue South, 2849 20th Avenue South, 2859 20th Avenue South, and 2800 21st Avenue South.

This proposed substation site is the paved lot west of 21st Avenue South, south of building on East 28th Street (1919 28th Street SE). This site may have sufficient space for the required substation facilities using a high-profile high voltage design with a modified low voltage side design provided adequate setbacks are available. Specific setback requirements have not been investigated for this site, but it appears there is sufficient land to accommodate estimated setbacks. The site is environmentally contaminated. A top view of the design is attached as **Attachment 9** (NH-99P226-26).

This site is not technically feasible.

HIA-G3

Address: 2803 Hiawatha Avenue

The land for this proposed substation location is a long narrow strip of land adjacent and east of Hiawatha Avenue. currently occupied by railroad tracks. Hennepin County on-line property records do not give dimensions for this property. The existing property is too small to accommodate the substation. A top view of the design is attached as **Attachment 10** (Ref. NH-99P226-27).

This site is not technically feasible.

HIA-G4

Address: 3147 Hiawatha Avenue

This property is the site of the former Hiawatha Substation owned by Xcel Energy and is located north of 32nd Street. This proposed site also includes adjacent vacant land owned by Mn/DOT. The site is too small to accommodate the substation. A top view of the design is attached as **Attachment 10** (NH-99P226-27).

This site is not technically feasible.

HIA-G5

Address: Not available.

The land for this site is a long narrow strip of land adjacent to, and east of Hiawatha Avenue and the Light Rail tracks, and north of 26th Street East. The on-line Hennepin County Property Locator identifies this space as light rail tracks. Hennepin County Property on-line records do not give dimensions for this property. The high-profile 115 kV may fit on this property, but more accurate property dimensions would be necessary to verify this. An easement would be needed for one of the duct bank systems to cross Minneapolis or Hennepin County property. Without this easement, this property cannot be utilized. A top view of the design is attached as **Attachment 10** (NH-99P226-27).

This site is technically feasible, but not reasonable and prudent.

Substation Site Feasibility Chart

Substation Site	Substation Feasibility	Transmission Feasibility	Distribution Feasibility	Other Factors	Overall Feasibility
MDT-1 Applicant's Proposed Site	1	1	1		1
MDT-2 Applicant's Alternate Site	1	1	1		1
MDT-MT28S	1	2	1		2
MDT-MT28N	1	2	2 or 3		2 or 3
MDT-MT28W	2	2	2 or 3	2 ^D	2 or 3 ^D
HIA-W Applicant's Proposed Site	1 ^A	1 ^A	1 ^{AB}		1 ^A
HIA-E Applicant's Alternate Site	1	1	1 ^B		1 ^B
HIA-ZD Applicant's Optional Site	1	1	1 ^B		1 ^B
HIA-G1	2 ^D	2 ^B	2 ^B		2 ^{B,D}
HIA-G2	2 ^D	2	2	3 ^C	3 ^C
HIA-G3	3	1	2 ^{AB}		3
HIA-G4	3	2	2		3
HIA-G5	1	2	2 ^B		2 ^B

Feasibility Legend

- 1 Technically Feasible
- 2 Technically Feasible but Not Prudent and Reasonable
- 3 Technically Infeasible

Notes:

- A Site is land presently publicly held
- B Conditional on Easement for Distribution and Transmission across Minneapolis or Hennepin County property
- C Anticipated Site Environmental Issues
- D Property Setback Requirements Verification Needed

Response By: Ed Smith
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Department: Substation Engineering and Design
Date: January 15, 2010