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**Memorandum**

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| **Date:** | August 4, 2021 |  |
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| **To:** | File |  |  |
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| **From:** | Brenda J. Perkins |
|  |
| **Subject:** | Alternative Routes Evaluation: Old Country Switch 345 kV Tap Transmission Line Project |

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This memorandum discusses my evaluation of routing alternatives for Oncor Electric Delivery Company LLC’s (“Oncor’s”) proposed Old Country Switch 345 kV Tap Transmission Line Project (“Proposed Transmission Line Project”). In addition to the recommendation for a route that best meets the requirements of the Texas Utilities Code and the Substantive Rules of the Public Utility Commission of Texas (“Commission”), I also selected alternative routes to be filed with this CCN Application.

The goal of this process is to provide the Commission with an adequate number of alternative routes to conduct a proper evaluation. These alternative routes provide good geographic diversity while complying with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code, Commission Procedural Rule 22.52(a)(4), and Commission Substantive Rule 25.101(b)(3)(B), including the Commission’s policy of prudent avoidance.

My recommendations are based on my reconnaissance and observations of the project area, my independent review of the data included in the *Environmental Assessment and Alternative Route Analysis for Oncor Electric Delivery Company LLC’s Proposed Old Country Switch 345 kV Tap Transmission Line Project in Ellis County, Texas* (“Environmental Assessment and Routing Study”), prepared by Freese and Nichols, Inc. (“FNI”), my discussions with FNI personnel, my discussions with Oncor personnel, my participation in the public participation meeting process, my review of correspondence related to the Proposed Transmission Line Project, my understanding of other input that Oncor received from interested parties, and other information. My recommendation incorporates consideration of engineering feasibility, the estimated cost of alternative routes, construction limitations, and other information.

FNI documented its efforts to identify potential preliminary alternative routes for the Proposed Transmission Line Project in Section 4.0 of the Environmental Assessment and Routing Study. After FNI completed the initial data gathering and constraints mapping process, they identified preliminary alternative route links on recent aerial photography from the United States Department of Agriculture National Agriculture Imagery Program. These preliminary alternative route links were selected considering the location of existing corridors, apparent property boundaries and routing constraints. Numerous preliminary alternative route links were identified by FNI, prior to the public participation meeting, that when combined, formed many preliminary alternative routes to connect the proposed Oystercatcher Solar Substation to the proposed Oncor Old Country Switch. The preliminary alternative route links evaluated by FNI are depicted in Figure 3-1 located in Appendix F of the Environmental Assessment and Routing Study.

Following the public participation meeting, modifications were made as a result of FNI’s further evaluation of the preliminary alternative route links. The modified preliminary alternative route links are discussed in detail in Section 6.0 of the Environmental Assessment and Routing Study and are briefly summarized below.

In general, links were modified where possible to: minimize the length of line within native forest area, cross Chambers Creek along a natural clearing in the riparian vegetation, and provide straighter route alignment while increasing the distance from habitable structures. Following the preliminary alternative route link revisions, FNI identified a total of 157 alternative routes that were further evaluated, as discussed in Section 7.0 of the Environmental Assessment and Routing Study.

Each of the 157 preliminary alternative routes identified by FNI possesses both positive and negative comparative attributes. I considered each of these attributes to select a set of geographically diverse routing alternatives to be filed as a part of this Application. Each alternative route complies with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code and the Commission's Substantive Rule 25.101, including the Commission's policy of prudent avoidance.

Below, I will discuss the alternative routes that I have selected to be filed with the Application. The routes can be grouped in many different ways; one approach is the grouping of routes into geographic corridors. Alternative routes can be grouped into six different geographic corridors. These six corridors are identified as: the west corridor using Link F; the west corridor using Link H; the central corridor using Link Z; the central corridor using Link AA; the east corridor using Link CCC; and the east corridor using Link GGG. Due to the location of this project’s endpoints being on opposite sides of Chambers Creek, all routes cross this creek. As shown in Figure 3-1 in the Environmental Assessment and Routing Study, most of the project’s potential wetlands are near Chambers Creek or its tributaries.

I selected 43 geographically diverse alternative routes to be filed with the CCN Application to allow for an adequate number of alternative routes to conduct a proper evaluation. The links that comprise these routes are presented in Table 1. Table 2 presents quantifiable environmental data on the 43 alternative routes filed as a part of the CCN Application.

I then presented these 43 alternative routes to Oncor’s engineer overseeing this project, Mr. Oscar Rodriguez, for consideration of engineering feasibility, construction limitations, and alternative route cost estimates. Below is a discussion of each of the six geographic corridors and the alternative routes selected for filing within each corridor.

The west corridor routes containing Link F (“Link F Corridor Routes”) vary in length from approximately 4.0 to 4.3 miles. Transmission line costs for Link F Corridor Routes range from $11,894,000 to $12,997,000. Link F Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 4 to 5. The filed Link F Corridor Routes cross Chambers Creek using Links K, I or R. Unlike the Chambers Creek crossing of Links I and R, Link K’s crossing of Chambers Creek has no potential wetland areas mapped by United States Fish and Wildlife Services (“USFWS”). The riparian areas crossed by the filed Link F Corridor Routes vary from 1,575 to 2,832 feet. The 4 alternatives filed in the Application that are in the west Link F corridor include Alternative Routes 2, 3, 5 and 7.

The west corridor routes containing Link H (“Link H Corridor Routes”) vary in length from approximately 3.8 to 4.4 miles. Transmission line costs for Link H Corridor Routes range from $12,124,000 to $13,695,000. Link H Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 4 to 5. The filed Link H Corridor Routes cross Chambers Creek using Links L, K or I. Unlike the Chambers Creek crossing of Links I and L, Link K’s crossing of Chambers Creek has no potential wetland areas mapped by USFWS. The riparian areas crossed by the filed Link H Corridor Routes vary from 1,226 to 2,305 feet. The 8 alternatives filed in the Application that are in the west Link H corridor include Alternative Routes 69, 70, 71, 72, 73, 74, 139 and 140.

The central corridor routes using Link Z (“Link Z Corridor Routes”) contain the shortest filed route (Route 54) with route lengths varying from approximately 3.2 to 3.7 miles. Transmission line costs for Link Z Corridor Routes range from $10,392,000 to $11,432,000. Link Z Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 4 to 9. The filed Link Z Corridor Routes cross Chambers Creek using Link Z. No potential wetland areas have been mapped by USFWS near Link Z’s crossing of Chambers Creek. Filed Link Z Corridor Routes have the second to lowest range of riparian areas crossed: from 701 to 1,878 feet. The 10 alternatives filed in the Application that are in the central Link Z corridor include Alternative Routes 13, 14, 17, 18, 31, 54, 55, 57, 58 and 100.

The central corridor routes containing Link AA (“Link AA Corridor Routes”) vary in length from approximately 3.6 to 4.0 miles. Transmission line costs for Link AA Corridor Routes range from $11,432,000 to $12,770,000. Link AA Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 3 to 5. The filed Link AA Corridor Routes cross Chambers Creek using Link AA. Just to the north of Link AA’s crossing of Chambers Creek, a potential wetland area has been mapped by USFWS. Filed Link AA Corridor Routes have the lowest range of riparian areas crossed: from 650 to 1,827 feet. The 15 alternatives filed in the Application that are in the central Link AA corridor include Alternative Routes 19, 21, 22, 24, 25, 59, 60, 61, 62, 64, 65, 130, 131, 133 and 134.

The east corridor routes containing Link CCC (“Link CCC Corridor Routes”) vary in length from approximately 4.0 to 4.6 miles. Transmission line costs for Link CCC Corridor Routes range from $11,707,000 to $13,423,000. Link CCC Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 1 to 2. The filed Link CCC Corridor Routes cross Chambers Creek using Link EEE1. No potential wetland areas have been mapped by USFWS near Link EEE1’s crossing of Chambers Creek. Filed Link CCC Corridor Routes have the highest range of riparian areas crossed: from 4,245 to 5,140 feet. The 4 alternatives filed in the Application that are in the east Link CCC corridor include Alternative Routes 144, 145, 147 and 151.

The east corridor routes using Link GGG (“Link GGG Corridor Routes”) include the longest filed route (Route 150) with routes within this corridor varying in length from approximately 4.8 to 4.9 miles. Transmission line costs for Link GGG Corridor Routes range from $13,400,000 to $13,694,000. Link GGG Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 1 to 2. Similar to Link CCC Corridor Routes, the filed Link GGG Corridor Routes cross Chambers Creek using Link EEE1. No potential wetland areas have been mapped by USFWS near Link EEE1’s crossing of Chambers Creek. Filed Link GGG Corridor Routes have the second-highest range of riparian areas crossed: from 3,635 to 3,892 feet. The 2 alternatives filed in the Application that are in the east Link GGG corridor include Alternative Routes 149 and 150.

After analyzing each of the 43 routes within the six geographic corridors, I selected Route 54 (Links A-T-U1-V1-X1-Y-Z-DD-FF-JJ-NN-OO) as the route that best meets the requirements of the Texas Utilities Code and the Commission's Substantive Rules.

The other significant factors which led to the selection of Route 54 include the following:

* The length of Alternative Route 54 is approximately 3.2 miles, which is the shortest among all the filed routes and approximately 1.7 miles shorter than the longest alternative route included in the Application (Alternative Route 150 is the longest at approximately 4.9 miles);
* The transmission line estimated cost for alternative Route 54 is the least expensive route at $10,392,000. It is $3,303,000 less than the most expensive alternative route (Route 72);
* Alternative Route 54 parallels existing compatible corridors for 43.8% of its length (including apparent property boundaries). Alternative Route 69 had the lowest percentage (8.3%) parallel to existing corridors; the highest percentage (59%) was along Alternative Route 55;
* there are five habitable structures within 500 feet of the centerline of Alternative Route 54 (Alternative Route 31 had the highest number of habitable structures (9) within 500 feet of the centerline);
* Alternative Route 54 crosses Chambers Creek parallel to an existing road corridor, Farm to Market (“FM”) 876, utilizing Link Z, where no potential wetland areas have been mapped by the USFWS;
* Alternative Route 54 has no recorded cultural resource sites within 1,000 feet of its centerline (15 of the filed routes have one recorded cultural resource site within 1,000 feet of their centerline);
* Alternative Route 54 has no FAA-registered airport with a runway greater than 3,200 feet within 20,000 feet of the centerline along its entire length;
* Alternative Route 54 has no FAA-registered airports with a runway greater than 3,200 feet within 10,000 feet of the centerline along its entire length;
* Alternative Route 54 has no electronic installations within 2,000 feet of its centerline along its entire length;
* Alternative Route 54 crosses three FM, county roads or other streets along its entire length (the alternative route that crossed the greatest number of FM, county roads or other street crossings was Route 72, with 7 crossings);

Alternative Route 54 has been judged to be feasible from an engineering perspective based on currently known conditions, without the benefit of on-the-ground and subsurface surveys, and there are no currently identifiable engineering constraints that impact this route that cannot be addressed with additional consideration by Oncor during the engineering and construction process.

Additional information concerning the issues addressed in this memorandum can be found in the Environmental Assessment and Routing Study, included as Attachment No. 1 to the CCN Application.

After considering all of the parameters and issues as discussed in this memo, I selected Route 54 as the route that best meets the requirements of the Texas Utilities Code and the Commission’s Substantive Rules.