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Working For You Today And Tomorrow

Thomas M. Jenkins
Group Vice President and Treasurer

August 30, 1994

Ms. Kim Wissman
Siting Officer
Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43266-0573

ICN #0001

CASE 94- 1449-EL-BLN

Reference: Sugarcreek-Greene 138kV Reconductoring Letter of Notification

Dear Ms. Wissman:

The Dayton Power & Light Company (DP&L) proposes to reconductor an existing 138kV transmission circuit in Greene County, Ohio. The purpose of this project is to ensure continued reliable service to customers in the South Metro Dayton area. DP&L respectfully submits the attached Letter of Notification pursuant to Rule 4906-1-02 of the Administrative Code, as determined by the "Transmission Line Matrix" in Appendix A of that rule.

DP&L appreciates your review of this Letter of Notification and we would be happy to provide any additional information which you may require. If you have any questions regarding this project, please contact me at 259-7210 or Hertzel Shamash at 259-7174.

Sincerely,

WTW8A:dc

Attachment

This project generally involves replacing the conductors on existing structures with larger conductors [Matrix Item (3)]. Three other specific areas of this project also fall under the Letter of Notification process requirements. These include:

(1) A section of line 0.96 miles in length where existing 2-pole H-frame structures will be replaced with single wood pole structures [Matrix Item (4)(a)].

(2) A minor relocation or extension of the existing line (new length is 0.20 miles) where the line needs to be routed in and out of a new distribution substation (Alpha Sub) [Matrix Item (1)(d)].

(3) A section of line 0.76 miles in length where existing 2-pole H-frame structures will be replaced with single steel pole double circuit structures required to add a 69kV line in that corridor [Matrix Item (4)(a)].

The format of this Letter of Notification follows the requirements of Rule 4906-15-12 of the Administrative Code.

4906-15-12 (C)

(1) The name of the project is the "Sugarcreek-Greene 138kV Reconductoring," reference number P-A36, referenced as Sugarcreek-Alpha 138kV Reconductoring on pages 3, 43, 44 and 54 of Section 4901:5-5-04 of DP&L's 1994 Electric Long-Term Forecast Report and Integrated Resource Plan (ELTFR/IRP).

(2) The project will involve the reconductoring of 10.35 miles of the circuit that connects the DP&L Sugarcreek and Greene Substations (Circuit 13821) and the construction of a new distribution substation (Alpha Substation) approximately 2.8 miles north of the existing Bellbrook Substation. The line (Circuit 13821) and substation facility locations are shown on MAP I. The new conductor will primarily be 1351.5 MCM 45X7 ACSR.

This project is needed to prevent thermal overloading of the Sugarcreek-Greene 138kV Circuit during single contingency outages. Completion of the project will enable operating conditions to be maintained consistent with DP&L's design guidelines. Specifically, while following normal daily operating procedures, the loss of any single transmission element should not cause any other transmission element to exceed its rating.

The project meets the requirements for a Letter of Notification since: 1) conductors on existing structures will be replaced with larger conductors and 2) structure type changes and the line extension total less than 2 miles. This type of work is consistent with that described in Items (3), (4)(a) and (1)(d) of the "Transmission Line Matrix", Appendix A, Rule 4906-1-02 of the Administrative Code.

(3) The location of the project has been highlighted on MAP II and MAP III (enclosed) of DP&L's 1994 ELTFR/IRP filing.

(4) As stated in paragraph (1), the project is referenced on pages 3, 43, 44, and 54 of Section 4901:5-5-04 of DP&L's 1994 ELTFR/IRP.

(5) Construction of the project is expected to be completed in two separate time frames. This is necessary because the required engineering, construction management and construction personnel are not available to complete the entire project at one time. The more critical portion between Sugarcreek Substation and the new Alpha Substation will be completed first. Work on this section including the structure replacements and relocation of line in and out of Alpha Substation is expected to begin on December 1, 1994. The construction activities will last about six months with completion scheduled by June 1, 1995. The remaining work between Alpha and Greene Substations will be done approximately one year later starting in March, 1996 and being completed in June, 1996.

(6) The Sugarcreek-Greene 138kV circuit (Circuit 13821) will be reconductored and a new 138/69kV distribution substation will be constructed approximately 2.8 miles north of the existing Bellbrook Substation. Details of the characteristics and requirements follow.

Background. Circuit 13821 now connecting the DP&L Sugarcreek and Greene Substations was originally constructed in 1954 as part of the O.H. Hutchings to Beaver 138kV transmission line. The line was originally designed and built to operate at a nominal voltage of 138kV and will continue to be designed and operated at 138kV. Since the initial construction, the original line has been rerouted from Beaver to Greene Substation (1966), rerouted and divided into two circuits at Sugarcreek Substation (1971-72) and tapped for Bellbrook Substation (1977). The resulting Sugarcreek-Greene Circuit 13821 is therefore constructed primarily of the original wood H-frame structures with minor line modifications made for the noted subsequent projects. These modifications only involved a few spans and are all located on DP&L owned substation properties, and they are not considered significant enough for further discussion here. One additional section of this line was relocated and modified in 1992 to accommodate construction of the new

Country Club of the North golf course development. This project was studied in a Short Form Application submitted to the Ohio Power Siting Board as Case No. 91-1660-EL-BTX, titled "Relocation of 2.25 Miles of Greene-Sugarcreek 138kV Circuit for the NBL Golf Course Development." This relocated section is shown on MAP I as the "1992 Relocation Section."

Conductor Information. The original construction utilized 636 MCM 26X7 ACSR conductor. The purpose of the Sugarcreek-Greene Reconductoring project is to replace the existing conductors with greater capacity 1351.5 MCM conductor. 45X7 ACSR will be used in all but the 1992 Relocation section where a 61 strand AAC will be used.

Structure Types and Quantities. The original type structures will be re-used for the new conductors over most of the project. The typical tangent H-frame structure used is shown on attached DP&L Standard 26-41 titled "Tangent Construction 0° to 1-1/2°." Larger angle structures use a two or three pole guyed design. These H-frame type structures typically have sufficient strength to accept the new heavier conductors and will be re-used except in those cases where, due to deterioration of the existing structures, a determination is made in the field to replace one or more of the poles and/or the wood structural members. At most angle structures, the guying/anchoring system will be rebuilt to accept the higher tensions of the heavier new conductors.

Additionally, poles will be replaced with taller poles at any location where the design indicates that increased ground clearance is required. Span lengths in the H-frame sections range from 430 feet to 970 feet. A total of 47 H-frame type structures will be re-used over 6.0 miles for an average span length of 670 feet.

The 1992 Relocation Section structures were changed when that relocation was completed. The north and south sections of that relocation utilized single wood pole structures with 138kV horizontal line post insulators. This tangent structure type is shown on attached DP&L Standard 26-141-1.2. The middle portion of the relocation section was constructed double circuit with a 69kV line (Circuit 6610: Trebein-Wilmington-Yankee) using single wood poles with the two circuits mounted "back to back" on 138kV horizontal line post insulators as shown on DP&L Standard 26-150-3 attached. Five steel poles were used in this section to make angles in the line. Typical spans in this relocation section are 230 feet with a total of 51 single pole structures used.

The reconductoring of Circuit 13821 through the 1992 Relocation Section will utilize the existing structures. The structures were originally designed for a 12kV underbuild, and by eliminating that future consideration, the poles at most locations will have enough design strength to accept the increased pole loading of the new heavier conductors. A few poles may be replaced with stronger poles if the final design indicates the additional strength is required.

A 0.96 mile section of the Sugarcreek-Greene line will have its structure type changed from the original H-frame structures to single wood pole structures. The section effected is identified on MAP I as the "Single Wood Pole Section." The proposed structures will be wood poles with 138kV horizontal line post insulators as shown on DP&L Standard 26-141-1.2. Poles will be located on the original centerline with spans in the 250 to 300 feet range resulting in approximately 18 new structures. Ten H-frame structures will be removed. The change of structure type is being done to make the line more acceptable through this area south of State Route 725 that has developed into residential housing. When originally built, the H-frame construction was across agricultural land, but with development, houses were built near the line. Changing the structure type to the single wood pole design will result in a more compact design that provides greater ground clearances and clearances to buildings, etc., a reduced right-of-way, lower EMF values at the edge of the right-of-way (see further discussion below) and a more aesthetic design through a developed area.

A 537 foot span of existing Circuit 13821 will be removed and replaced/relocated/extended into the new Alpha Substation. The total length of the new sections of line will be approximately 1050 feet (0.20 miles) and will require installation of two single wood pole guyed double dead end structures. The two new line sections formed will be terminated on takeoff structures that are part of the new Alpha Substation. The total relocation/extension will be made on DP&L owned property.

Additionally, as part of the overall reconductoring project, a 0.76 mile section of original H-frame construction south of the new Alpha Substation will be rebuilt to accommodate a 69kV line emanating from Alpha Substation. A total of 7 existing H-frame type structures will be replaced with new double circuit single steel pole structures at approximately the original locations of the H-frames. The typical tangent steel pole structure to be used is shown in Figure 3 attached. The use of steel pole structures in this area is required so both circuits may readily be carried through the original right-of-way corridor.

Right-of-Way Requirements. The original Circuit 13821 line was built on a right-of-way that was secured primarily in 1954. DP&L plans to utilize this earlier procured right-of-way, and the new granted right-of-way through the 1992 Relocation Section, for the reconductoring project and the continued operation of this 138kV circuit. The original right-of-way is typically described as being along a certain centerline alignment (a "centerline description" right-of-way) and has no specified width defined for it. As such, no area is specifically defined where buildings and other facilities are prohibited, and no specific "edge of right-of-way" is given that could be used for determining EMF values. If DP&L were planning to build a new line at this time, of the same general scope as the planned reconductoring of the existing line, a 100 foot wide right-of-way would be procured for the H-frame and double circuit steel pole sections of line. The 1992 Relocation Section resulted in a specified width of right-of-way in that area of 50 feet to accommodate the relatively short span double circuit construction. This 50 foot wide right-of-way will be maintained in this area and also will be assumed for the section rebuilt to single wood pole structures south of State Route 725. These 100 foot and 50 foot wide right-of-way widths are used for determining the "edge of right-of-way" EMF values discussed below and presented in Tables 2, 3, 4 and 5.

(a) Electric and Magnetic Fields. Electric and magnetic fields are produced by the presence of voltage and current associated with any electrical device including the operation of Circuit 13821. Electric fields are produced by voltage and magnetic fields by current. In both cases, the field strength is related to the strength of the source, the distance from the source, the geometry of the source, and the interaction of any other sources of electric and magnetic fields in the area.

The electric field produced by a 138kV transmission line is predictable and may be calculated for a specific wire geometry. The threshold of sensation for a person standing in an electric field is approximately 15kV per meter which is at least five times greater than the maximum field expected directly under any of the 138kV line configurations proposed for the reconductoring of Circuit 13821.

Electric fields can induce a voltage on metallic objects, such as sheds, fences, and farm equipment, which may be located close to the transmission line. This is usually not a problem with 138kV transmission lines because of the relatively high ground clearances used for this voltage level. The induced voltage can be eliminated by properly grounding the metallic objects. DP&L will work with any customer who might experience such a problem to help resolve

the problem in an expeditious manner. Electric fields can be reduced or eliminated by shielding provided by buildings, trees, mounds of earth and other conducting materials. Specific values of electric fields based on the proposed design configurations and the line loading conditions specified for the Sugarcreek-Greene line are summarized in Tables 2, 3 and 4.

Magnetic fields can be calculated for transmission lines, but it is more difficult to predict the actual fields at a given time and place because the field is dependent on the load current for each phase, the current of the shield wire or neutral, other magnetic fields in the area, including the earth's background fields, other grounding systems in the area, and other conditions. As electric load conditions and the currents in the wires change, so do the magnetic fields. Magnetic fields are not perceived by humans at levels generated by transmission lines. Unlike electric fields, ordinary materials do not provide a shield from magnetic fields. The line design characteristics would provide for low levels of calculated magnetic field strengths. Consequently, magnetic fields are estimated to have insignificant impacts. Specific values of calculated magnetic fields based on the proposed design configurations and the line loading conditions specified for the Sugarcreek-Greene line are summarized in Tables 2, 3 and 4.

The proposed structure configurations for the reconductoring of Sugarcreek-Greene have been evaluated for electric and magnetic fields. Four different structure designs will be utilized for the reconductoring project. These structure types include:

1. "Wood H-Frame Structures" used over most of the line (the original design structure that will remain).

2. "Single Wood Pole Structures" to be used as replacements for H-frames in the residential area south of SR 725 and as presently exist in part of the 1992 Relocation Section shown on MAP I.

3. "Double Circuit Steel Pole Structures" that will carry Circuit 13821 and a 69kV line (Circuit 6615) south from the new Alpha Substation.

4. "Double Circuit Wood Pole Structures" that will carry Circuit 13821 and a 69kV line (Circuit 6610) through part of the 1992 Relocation Section.

The different structure types/line configurations were evaluated at the line loading conditions specified in the Letter of Notification requirements. It should be noted that the different structure types are located in different line sections specified above and shown on MAP I. As such, different line loading (current) is applicable to different structure types because separate sections of Circuit 13821 have different loadings depending on substation location, etc. Where a structure type is used in more than one line section, the higher electric loading created in those sections is used for the calculations. A phase-to-phase voltage of 138kV and balanced phase currents were assumed for the 1351.5 MCM phase wires. An ambient winter temperature of 0°C, wind of 2 mph, emissivity factor for solar absorption of 0.8, altitude of 1,000 feet, and conductor temperature rise of 80°C were assumed to determine the 1792 amperes winter normal load maximum capacity of the 1351.5 MCM conductor. The resulting 80°C conductor temperatures were used to determine wire sag conditions. Similarly, line loading conditions and conductor temperatures were determined for a "Normal Maximum Loading" with all transmission elements in operation and for an "Emergency Line Loading" condition that for this project was determined to be the first contingency outage of Sugarcreek to Normandy Tap point of Circuit 13822. All calculations for the electric and magnetic fields were determined at the low point of the phase conductors. Based on the calculations for fields 3 feet above the earth, the values summarized in Tables 2, 3 and 4 were determined for the three loading conditions and four structure types.

The winter normal load maximum capacity of the conductor and the maximum emergency loading conditions noted above are conditions that will very seldom, if ever, be reached. More realistic values of the electric and magnetic field strengths that may be expected to occur over more typical or average conditions have also been calculated for the alternate structure types and line sections under consideration. Electrical loading on the transmission lines is expected to vary continually throughout any given day and also throughout the year, dependent on time, weather conditions, customer usage, transmission system loading, and transmission facilities' in-service conditions. On average, reconductored Circuit 13821 south of Bellbrook Substation is expected to normally carry approximately 132 MVA which, for the 138kV design, converts to balanced phase currents of 552 amperes on the phase wires. Average normal loads on other sections and parallel lines were similarly computed. A typical conductor

temperature of 60°F has been used to determine wire sag conditions and the resulting clearances above ground. The calculations for the electric and magnetic fields were again determined at the low point of the phase conductors. Based on the calculations for fields 3 feet above the earth, the values summarized in Table 5 were determined.

(b) Much discussion has taken place regarding the health effects of electric and magnetic fields (EMF). In the late 1960s and early 1970s, the emphasis was directed at electric fields. After many studies it was determined that no health effects resulted from electric fields. In the late 1970s, the emphasis shifted to magnetic fields based on an epidemiological study researched by Wertheimer and Leeper in Denver, Colorado. Since that time, other research projects have investigated the effects of magnetic fields. Some studies have suggested a very weak linkage between magnetic fields and certain adverse health effects, others have shown no relationship at all. As of today, the scientific community has not determined any definitive relationship between magnetic fields and adverse health effects. Research is continuing into possible health effects produced by magnetic fields. DP&L will continue to support and monitor the research.

It is DP&L's position that the present research has not established a relationship between magnetic fields and any health effects. DP&L has proposed to reconductor the existing Sugarcreek-Greene line (Circuit 13821) with full consideration of the current status of EMF research. As such DP&L does not feel a change in structure type or relocation of the corridor for Circuit 13821 is prudent, justified or necessary. The reconductoring of this line on mostly existing structures will have significantly less environmental impact than establishing a new corridor and/or new structures. The corridor itself is generally in a good location from an environmental and aesthetic viewpoint, and it has gained some acceptance over the years as it has matured and blended into the countryside. Consequently other design alternatives of structures, conductor configurations and phasing, structure heights, corridor location and right-of-way width modifications have generally not been adopted for this project with respect to electric and magnetic fields. A couple of exceptions are identified below.

As noted previously, some poles on existing structures may need to be replaced if deterioration is found or if design considerations indicate need for increased clearances. Where such replacements are determined appropriate, consideration will be given to electric and magnetic field concerns and thereby the desirability of increased structure height and subsequent reduction in field strength values in comparison to other design and aesthetic concerns.

The phase configuration used on Circuit 13821 has no impact on field strengths except in the two areas where Circuit 13821 will be combined on double circuit structures with 69kV circuits. This occurs in two line sections. Part of the 1992 Relocation Section contains double circuit wood pole structures where Circuit 13821 is combined with Circuit 6610. Here a study of the design configurations and possible phasing arrangements of the two circuits have shown the present phasing of the two circuits results in the lowest possible fields through the area, and therefore no phasing changes are proposed. The second section where phasing considerations impact field strengths is the double circuit steel pole section south of the new Alpha Substation. Here a standard steel pole design will be used that is considered best from an overall design standpoint considering construction, maintenance, visual impact and EMF issues. Since the load flows on the two circuits installed on these steel pole structures are in opposite directions, except possibly during remotely possible contingency outage conditions, the phasing arrangement resulting in the lowest magnetic field strengths is where the phasing is the same on both circuits. The lines will therefore be installed in this area to have the same phasing.

One final section of line which is of interest with respect to EMF is the single wood pole structure section through the residential area south of SR 725. As noted above, the structure type here is being changed from the existing H-frames to single wood poles with horizontal line post insulators to provide, in part, a more compact design with greater clearances and lower EMF values. By comparing the analysis values for H-frame structures and single wood pole structures, generally a decrease in field strengths is noted. Maximum electric fields are about 30% less for the single pole structures. The edge of the right-of-way values are slightly higher for the single pole considering a 50 foot right-of-way requirement for this design compared to a 100 foot right-of-way for H-frames. If a 100 foot right-of-way is assumed for both designs, electric fields for the single pole are 60% less at the edge of right-

of-way. Maximum magnetic fields are about 60% less for the single pole design. Single pole design edge of right-of-way magnetic fields are slightly less than the H-frame design assuming a 50 foot single pole design right-of-way width and 60% less assuming the 100 foot width. Overall, therefore, changing structure type through this residential area results in roughly a 30% to 60% decrease in field strengths in this area.

(7) The estimated cost of reconductoring Sugarcreek-Greene 138kV is $953,000 including structure replacements and the relocation of the line in and out of the new Alpha Substation.

The Company retained Dames & Moore to research land usage in the project corridor. Please refer to paragraphs (8) and (11) below for a description of their findings.

(8) The Sugarcreek-Greene electrical transmission line route is shown in Figures 1 and 2. Originating at the existing Sugarcreek Substation in Sugarcreek Township, Greene County, the transmission line heads west for approximately 400 feet over substation property. The route then proceeds northeast approximately 3,600 feet crossing a mixture of undeveloped and agricultural land. The route then continues north for approximately 5,000 feet, following fencerow east of Blackstone Thoroughbred Farm, crossing Conference Road and continuing north through Sugarcreek Reserve. The route enters the City of Bellbrook and proceeds through residential development for 5,100 feet until it crosses State Route (SR) 725 and passes immediately east of the Bellbrook Substation. The line leaves the City of Bellbrook approximately 2,600 feet north of SR 725. From SR 725 the line follows a pipeline easement for approximately 3 miles over a mixture of undeveloped and agricultural land and some residential properties. The transmission line separates from the pipeline at the east end of the new Alpha Substation site approximately 3,300 feet northeast of the crossing of Alpha-Bellbrook Road. The transmission line then heads in a more easterly direction for approximately 4,400 feet, crossing McBee Road and the Little Miami River. Approximately 1,500 feet east of where the transmission line crosses the Little Miami River, the line heads north for approximately 1,200 feet and then 700 feet east toward Shepherd Road, crossing undeveloped agricultural land. The line follows Shepherd Road on the north side for approximately 800 feet, then crosses the road and heads east and north following a path along fencerow, crossing Indian Ripple Road 300 feet east of the relocated Shepherd Road. The line then heads southeast along the north side of Indian Ripple Road for approximately 800 feet, then northeast for approximately 2,200 feet, and northwest for approximately 2,600 feet. The land use affecting the routing of the line in the area from 2,600 feet south of Indian Ripple Road to 4,800 feet north of Indian Ripple

Road is Country Club of the North, which is being developed north and south of Indian Ripple Road into a golf course and residential development. The electrical transmission line then heads northeast approximately 7,000 feet, crossing undeveloped and agricultural lands, the Little Miami River and U.S. Route 35, terminating at the Greene Substation.

The project is located in Sugarcreek and Beavercreek Townships in Greene County. The only municipality which the project passes through is the City of Bellbrook. A guide to the land features of the project area is provided as a separate attachment to Figures 1 and 2.

As described above, the Sugarcreek-Greene electric transmission line crosses much undeveloped and agricultural land; therefore, the population density of the area is low. The only significant area of population that the electric transmission line passes through is the City of Bellbrook. Provided below are the total populations for the municipalities, townships and counties through which the project passes:

Beavercreek Township	35,536
Sugarcreek Township	3,400
City of Bellbrook	6,511
Greene County	136,731

(Ohio Data Users Center Population Series, February 1991)

(9) The following agencies have been contacted regarding this project and have been provided a copy of this Letter of Notification:

President, Greene County Board of Commissioners
61 Greene Street
Xenia, OH 45385

President, Sugarcreek Township Trustees
26 E. Franklin Street
Bellbrook, OH 45305-2003

President, Beavercreek Township Trustees
1981 Dayton-Xenia Road
Beavercreek, OH 45423

Ohio EPA, Southwest District Office
40 South Main Street
Dayton, OH 45402

Miami Valley Regional Planning Commission
40 West Fourth Street
Dayton, OH 45402

Mayor, Bellbrook, Ohio
15 E. Franklin St.
Bellbrook, OH 45305

Dayton-Montgomery County Park District
1375 E. Siebenthaler Avenue
Dayton, OH 45414

(10) No unusual conditions resulting in significant environmental, social, health or safety impacts will occur due to this project.

(11) Agricultural district properties located along the Sugarcreek-Greene electric transmission line are shown in Figures 1 and 2. Fifteen properties in the agricultural district program are along the route. All the identified agricultural district properties are located in Greene County. Two agricultural district properties are split by the Sugarcreek-Beavercreek Township line.

Two agricultural district properties are located north of the Sugarcreek Substation. Another two agricultural properties are located south of Feedwire Road and west of Upper Bellbrook Road. Three agricultural district properties are located in the northeast corner of the intersection of Carpenter and Alpha Bellbrook Roads. An additional cluster of agricultural district properties are located between the Little Miami River and Indian Ripple Road, west and east of the electric transmission line. One agricultural district property is located north of Indian Ripple Road and south of the Country Club of the North golf course development.

Due to the temporary nature of construction during this project, it is not anticipated that construction impacts will occur. Access to farmland may be temporarily restricted as construction workers move through these areas. However, no adverse long-term impact on agricultural practices and drainage patterns of agricultural district properties are anticipated.

(12) MAP I is provided to show the location of the project with respect to area streets and roads. Instructions for locating and viewing the facility follow:

From Columbus proceed south on I-71 to U.S. Route 35. Take Route 35 west toward Xenia. Proceed around Xenia on the bypass (Rt. 35) toward Dayton. At the first traffic signal west of Xenia turn right on Valley Road. Proceed to the first stop sign and turn left on Dayton-Xenia Road. After

crossing the Little Miami River bridge, turn left at the traffic signal and proceed west (still on Dayton-Xenia Road) for 3/4 mile to Greene Substation (on left). This is the north end of the reconductoring project. Follow MAP I to see the other project facilities.

The Company retained Dames & Moore to perform an archaeological, cultural resource, ecological and environmental assessment of the proposed project site. Please refer to the following paragraphs (13-15) for a description of the investigations.

(13) The location of cultural resources which are located near the Sugarcreek-Greene electric transmission line are shown on Figures 1 and 2. Table 1 provides a summary of these cultural resources. Most of these cultural resource sites are of an unknown nature and are located in agricultural areas. It is not anticipated that impacts to these cultural resources will occur since no new structures will be set and no new access roads (permanent or temporary) will be required in these areas.

(14) The proposed project will follow an existing transmission line corridor and right-of-way. The right-of-way and adjacent areas were evaluated as part of the study to identify the possible presence of federal and state designated species including endangered species, threatened species, rare species, species proposed for listing, species under review for listing, and species of special interest that may be located within the area likely to be disturbed by the project. As part of this Letter of Notification, a field reconnaissance and supplemental investigations were conducted to evaluate the possible presence of the subject species in the vicinity of the project. This evaluation did not identify any potential environmental impacts as a result of the project.

Species listed by the state or federal government as endangered or threatened were evaluated during the field survey for their potential occurrence along the transmission route. U.S. Fish and Wildlife Service (USFWS) and the Ohio Department of Natural Resources Division of Natural Areas and Preserves (ODNR-DNAP) were contacted to determine recorded sightings for the study area.

An ecological survey was conducted of the proposed project. This survey involved a field reconnaissance to document endemic vegetation and wildlife habitats that comprise the ecological resources along the right-of-way and adjacent areas. The field reconnaissance program was conducted on July 28 and 29, 1994. The vegetations cover types along the right-of-way and adjacent areas (excluding residential, commercial, and industrial land) include agricultural (pasture, cropland, and field border/fencerow), woodlands, and brush and other herbaceous lands (Figures 1 and 2).

At the time of this report, a reply from the USFWS has not been received by Dames & Moore. Literature review based on other nearby projects indicated the transmission line route is within the range of two federally-protected species of scientific interest. These species and the potential related impacts of the project are described below.

Indiana Bat. The Indiana bat's preferred habitat includes caves, areas near streams, and under the bark of certain hickories. There are no known caves present along the transmission line corridor, and the wooded portions of the project do not provide suitable hickory species to constitute viable habitat for this species. Therefore, no impact on the Indiana bat is anticipated due to the completion of this project.

Bald Eagle. The vicinity of the project does not provide the high perch trees adjacent to large, open waterbodies needed to support use of the area by the bald eagle. Thus, it is not anticipated that the project would have an impact on the bald eagle.

According to information supplied by ODNR, the only state-protected species in the vicinity of the project area is the snuffbox mussel (Epioblasma triquetra), which was located in the Little Miami River at the Indian Ripple Road Bridge. This species is listed as threatened. As the project involves reconductoring existing poles or pole replacement, the Little Miami River is not likely to be impacted. Poles in the area of these drainages are located on hillsides above the valley associated with the river. Therefore, no adverse impacts to the snuffbox mussel as a result of the project are anticipated.

(15) An ecological survey was conducted of the proposed project. This survey involved a field reconnaissance to document endemic vegetation and wildlife habitats that comprise the ecological resources in the right-of-way and adjacent areas. The field reconnaissance program was conducted on July 28 and 29, 1994. Supplemental information was obtained from the Ohio Department of Natural Resources (ODNR) Division of Natural Areas and Preserves (DNAP) and through a review of aerial photographs taken in February 1993. This survey did not identify any ecological issues associated with the project.

The vegetation cover types along the right-of-way and adjacent areas (excluding residential, commercial, and industrial land) include agricultural (pasture, cropland, and field border/fencerow), woodlands, and brush and other herbaceous lands (Figures 1 and 2). Based on a literature review, agency contacts and a field survey, the following areas of special or unique ecological significance were identified along the right-of-way and adjacent areas:

Streams or Drainage Channels. The certified route crosses drainages and their associated floodplains including Sugar Creek, Little Sugar Creek, and the Little Miami River, all perennial streams, as well as several unnamed intermittent tributaries. Of these drainages, the Little Miami River is designated as a National and State Wild and Scenic River. As the project involves reconductoring existing poles or pole replacement, these drainages are not likely to be impacted. Poles in the area of these drainages are located on hillsides high above the valley associated with the drainages. No adverse impacts to the streams, as a result of the project, are anticipated.

Lakes, Ponds or Reservoirs. One small farm pond, in the vicinity of the Sugarcreek Substation, is located adjacent to the certified route. The right-of-way does not cross this water body, and therefore, the project will not likely impact the pond.

Marshes, Swamps, or Other Wetlands. The possible presence of wetlands was evaluated during the site survey using criteria established by the U.S. Army Corps of Engineer's 1987 Wetlands Delineation Manual. No wetland areas were identified along the right-of-way and its adjacent areas. Therefore, adverse impacts to wetlands as a result of the project, are not anticipated.

Woody and Herbaceous Vegetation Land. The majority of land along and adjacent to the right-of-way is currently in agricultural use (Figures 1 and 2). Several areas immediately adjacent to the route are vegetated by upland woods comprised of beech, slippery elm, wild cherry, box elder, and red maple species. It is not anticipated that the reconductoring project and pole replacement activities will have an impact to these wooded areas.

Nature Reserves. The certified route passes through or in the vicinity of two nature reserves: Sugarcreek Reserve and The Narrows Reserve, as discussed below.

Sugarcreek Reserve is located southwest of Bellbrook in an area north of Conference Road and south of Marcia Drive. This 596-acre nature reserve is managed by the Dayton-Montgomery County Park District, and includes natural wooded areas, planted prairie, as well as provisions for recreational activities. The existing transmission line route crosses the eastern section of the reserve along an approximate 2,600 linear foot right-of-way vegetated in both natural and planted prairie vegetation. The project is likely to have minimal impacts on the planted prairie, which is reported to be burned or mowed yearly as part of the maintenance of the prairie.

The Narrows Reserve is located along the Little Miami River east of McBee Road. This 162-acre natural reserve is managed by the Greene County Park District, and includes natural wooded areas and limited recreational activities. The certified route does not cross The Narrows, and therefore, the project is not likely to have an impact on the reserve.

(16) No local, state, or federal government agencies have special requirements that must be met in connection with the construction of this project.

(17) No litigation is pending concerning this project.

Table 1
Cultural Resources in the Vicinity of the Sugarcreek-Greene Electric Transmission Line

Proposed Site

Site #	Affiliation	Name of Site	Setting	USGS7.5-minute Quadrangle Map
GR 58	Unknown	Rogers Site	Promontory	Bellbrook
GR 63	Unknown	Murphy Site	Agricultural	Bellbrook
GR 73	Unknown	No Name Provided	Agricultural	Bellbrook
GR 83	Unknown	No Name Provided	River Bank	Bellbrook
GR 87	Unknown	River Island Site	Floodplain	Bellbrook
GR 88	Unknown	No Name Provided	River Bluff	Bellbrook
GR 99	Unknown	Undetermined Prehistoric	Agricultural	Bellbrook
GR 800	Unknown	No Name Provided	Agricultural	Bellbrook
GR 801	Unknown	No Name Provided	Agricultural	Bellbrook
GR 70	Unknown	No Name Provided	Esker	Waynesville

Source: Ohio Archaeological Inventory, Ohio Historic Preservation Office, 1994

Table 2
Fields at Normal Maximum Loading
Conductor Temperature Used = 120°F

Wood H-Frame Structures
Load Current Circuit 13821 = 900 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.81	0.80	0.66
Magnetic (mG)	206	206	56

Single Wood Pole Structures
Load Current Circuit 13821 = 900 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.35	1.21	0.73
Magnetic (mG)	86	86	52

Double Circuit Steel Pole Structures
Load Current Circuit 6615 = -798 Amps
Load Current Circuit 13821 = 799 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	2.29	2.09	0.22
Magnetic (mG)	106	105	25

Double Circuit Wood Pole Structures
Load Current Circuit 6610 = 261 Amps
Load Current Circuit 13821 = 402 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	0.92	0.87	0.46
Magnetic (mG)	24	23	18

* Maximum field strengths are given because they are sometimes higher than fields under the lowest conductor, the value requested.

** The edge of right-of-way value given is the maximum of the two values. See discussion for edge of right-of-way location.

Table 3
Fields at Emergency/Contingency Load
Conductor Temperature Used = 80°C

Wood H-Frame Structures
Load Current Circuit 13821 = 1364 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	2.24	1.16	0.66
Magnetic (mG)	375	375	89

Single Wood Pole Structures
Load Current Circuit 13821 = 1364 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.47	1.31	0.75
Magnetic (mG)	145	145	83

Double Circuit Steel Pole Structures
Load Current Circuit 6615 = -1462 Amps
Load Current Circuit 13821 = 1247 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	2.69	2.34	0.19
Magnetic (mG)	216	216	50

Double Circuit Wood Pole Structures
Load Current Circuit 6610 = 252 Amps
Load Current Circuit 13821 = 519 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	0.92	0.87	0.46
Magnetic (mG)	31	31	23

* Maximum field strengths are given because they are sometimes higher than fields under the lowest conductor, the value requested.

** The edge of right-of-way value given is the maximum of the two values. See discussion for edge of right-of-way location.

Table 4
Fields at Winter Normal Conductor Rating Loading
Conductor Temperature Used = 80°C

Wood H-Frame Structures
Load Current Circuit 13821 = 1792 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	2.24	1.17	0.66
Magnetic (mG)	493	493	117

Single Wood Pole Structure
Load Current Circuit 13821 = 1792 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.47	1.31	0.75
Magnetic (mG)	190	190	109

Double Circuit Steel Pole Structures
Load Current Circuit 6615 = -2403 Amps
Load Current Circuit 13821 = 1792 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	2.68	2.33	0.18
Magnetic (mG)	331	331	86

Double Circuit Wood Pole Structures
Load Current Circuit 6610 = 1108 Amps
Load Current Circuit 13821 = 1756 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.01	0.95	0.48
Magnetic (mG)	116	112	82

* Maximum field strengths are given because they are sometimes higher than fields under the lowest conductor, the value requested.

** The edge of right-of-way value given is the maximum of the two values. See discussion for edge of right-of-way location.

Table 5
Fields at Average Normal Loadings
Conductor Temperature Used = 60°F

Wood H-Frame Structures
Load Current Circuit 13821 = 552 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.43	0.53	0.64
Magnetic (mG)	103	103	32

Single Wood Pole Structure
Load Current Circuit 13821 = 552 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	1.22	1.11	0.70
Magnetic (mG)	48	48	35

Double Circuit Steel Pole Structures
Load Current Circuit 6615 = -513 Amps
Load Current Circuit 13821 = 494 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	2.07	1.93	0.24
Magnetic (mG)	57	56	14

Double Circuit Wood Pole Structures
Load Current Circuit 6610 = 42 Amps
Load Current Circuit 13821 = 238 Amps

Fields	Maximum*	Center Line of Right-of-Way	Edge of Right-of-Way**
Electric (kV/m)	0.85	0.80	0.45
Magnetic (mG)	14	14	11

* Maximum field strengths are given because they are sometimes higher than fields under the lowest conductor, the value requested.

** The edge of right-of-way value given is the maximum of the two values. See discussion for edge of right-of-way location.

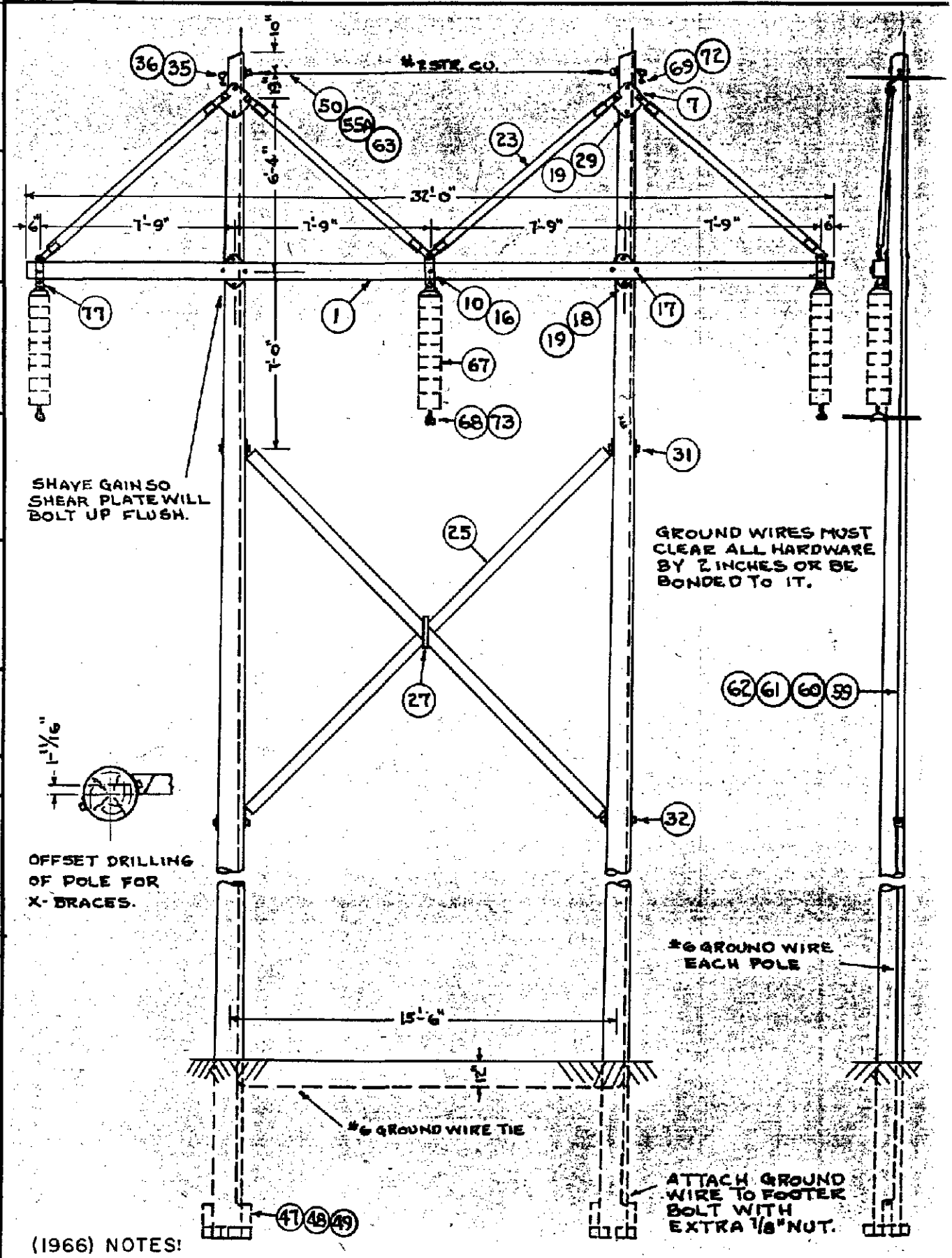
TANGENT CONSTRUCTION 0° TO 1-1/2°

(LIMITED ISSUE FOR HISTORICAL PURPOSES)

26-41
(FORMERLY Tr-41)

REVISED	RLW	RENUMBERED
CHECKED	LFB	
APPROVED		

DRAWN	A.E.A.	12-10-52
CHECKED	K.E. Grauman	12-10-52
APPROVED	J.M. Fan	7-3-53



(1966) NOTES:

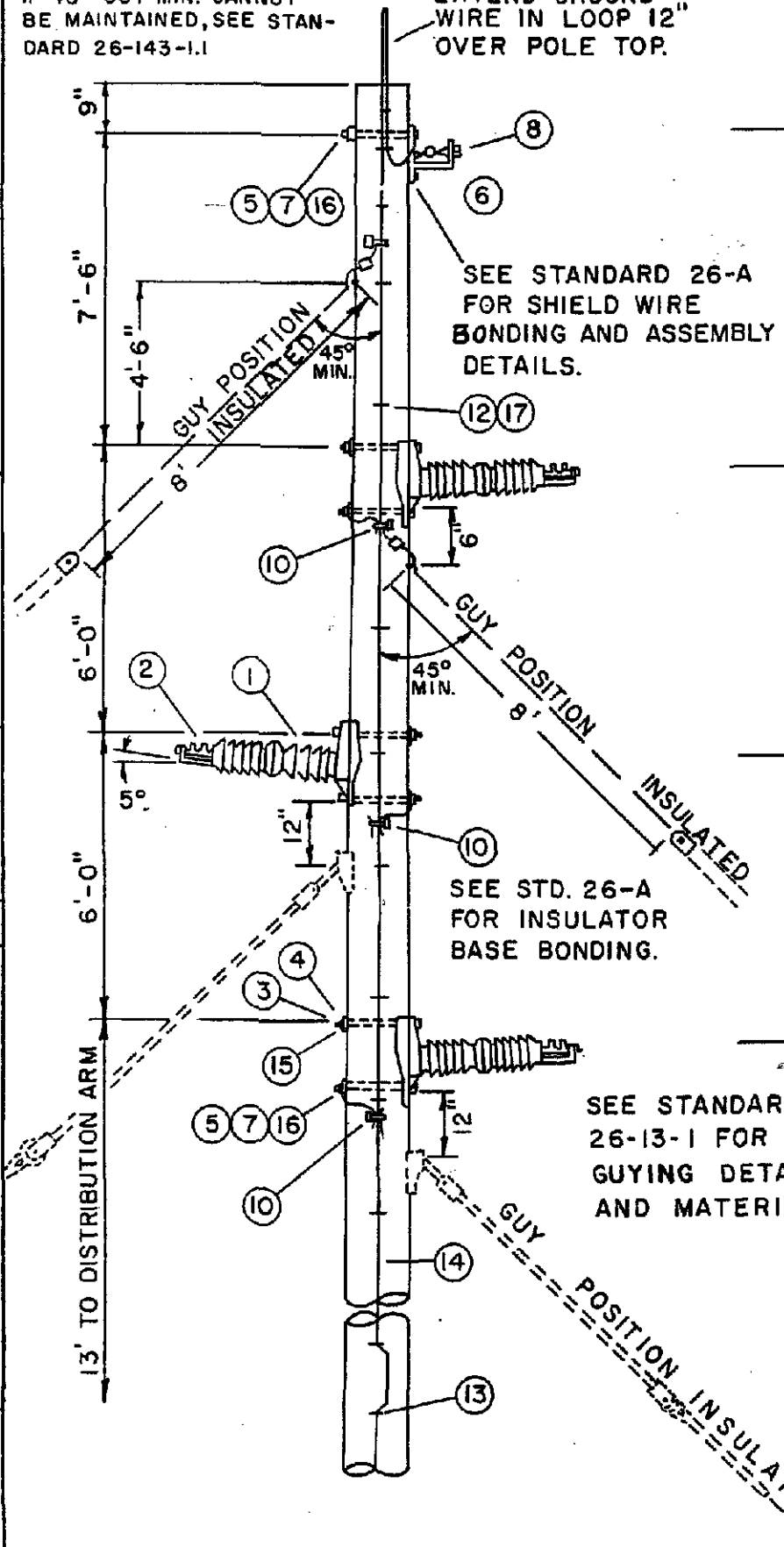
1. THIS STANDARD RENUMBERED ONLY.
2. SEE STD. 26-46 FOR BILL OF MATERIAL.

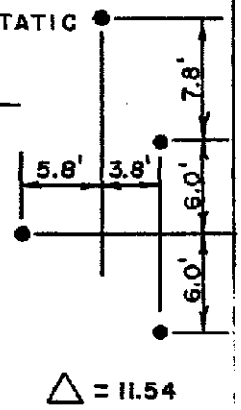
HORIZONTAL POST INSULATOR 138KV - TANGENT POLE AND 2° TO 10° CORNER

(CONT. ON PAGE 26-141-2.2)

IF 45° GUY MIN. CANNOT BE MAINTAINED, SEE STANDARD 26-143-1.1

EXTEND GROUND WIRE IN LOOP 12" OVER POLE TOP.

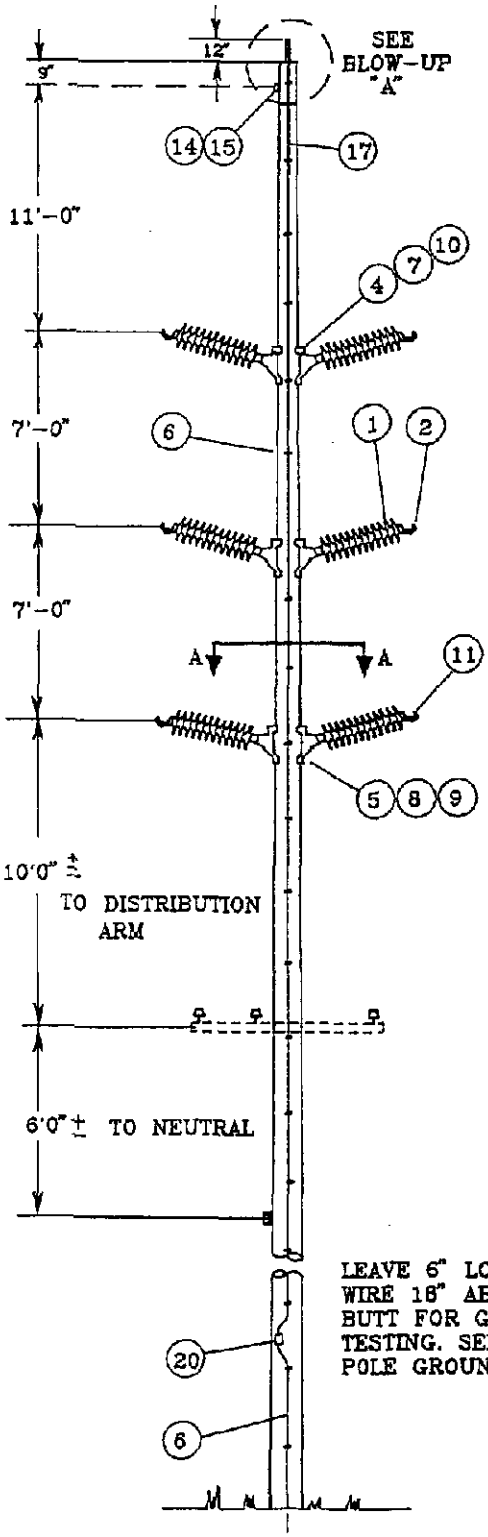




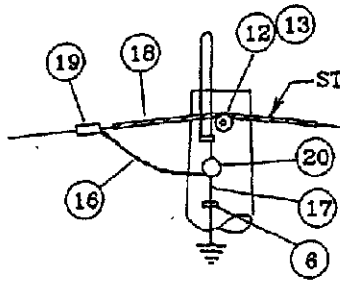
NOTES:
1. THE SHIELD WIRE CONNECTION IS NOT ADEQUATE FOR DISTRIBUTION NEUTRAL USAGE.
2. LIMIT SPAN LENGTHS TO 350' (300' WITH UNDERBUILD) FOR 477 MCM 18/1 PER GALLOPING CONDUCTORS.
3. LEAVE A 6" LOOP IN GROUND WIRE 18' ABOVE POLE BUTT FOR GROUND TESTING. SEE STD. 1-8 FOR POLE GROUNDING.

DRN.	P.D.	10-10-69	CKD.
APPROVED			
REVISED	W.E.P.	2-6-70	
APPROVED			

DP&L GENERAL REFERENCE GUIDE M-2588 4-81 (01)	SYSTEM ELECTRIC CONSTRUCTION STANDARDS TITLE TRANSMISSION STANDARD 26-150-3 SUBJECT DOUBLE CIRCUIT TANGENT CONSTRUCTION BACK TO BACK 136KV POST INSULATORS	PAGE 26-150-3 DATE MAR 92 REPLACES PAGE NEW DATE

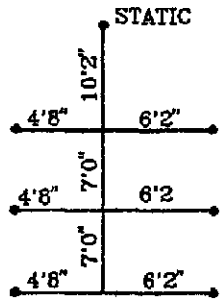


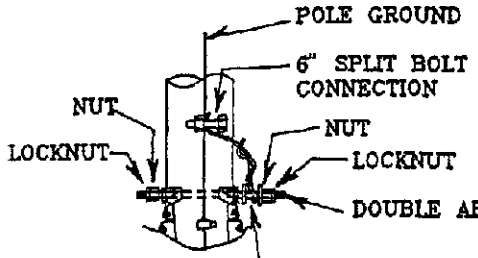
LEAVE 6" LOOP IN GROUND WIRE 18" ABOVE POLE BUTT FOR GROUND TESTING. SEE STD, 1-F FOR POLE GROUNDING.



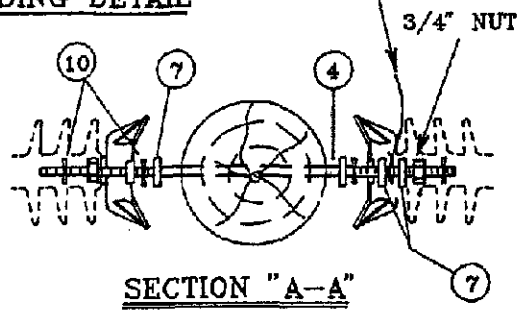
STATIC SUPPORT- SEE STANDARD 26-A FOR DETAILS.

BLOW-UP "A"





HORIZONTAL INSULATOR BRACKET GROUNDING DETAIL



SECTION "A-A"

EC-01-26-133.00

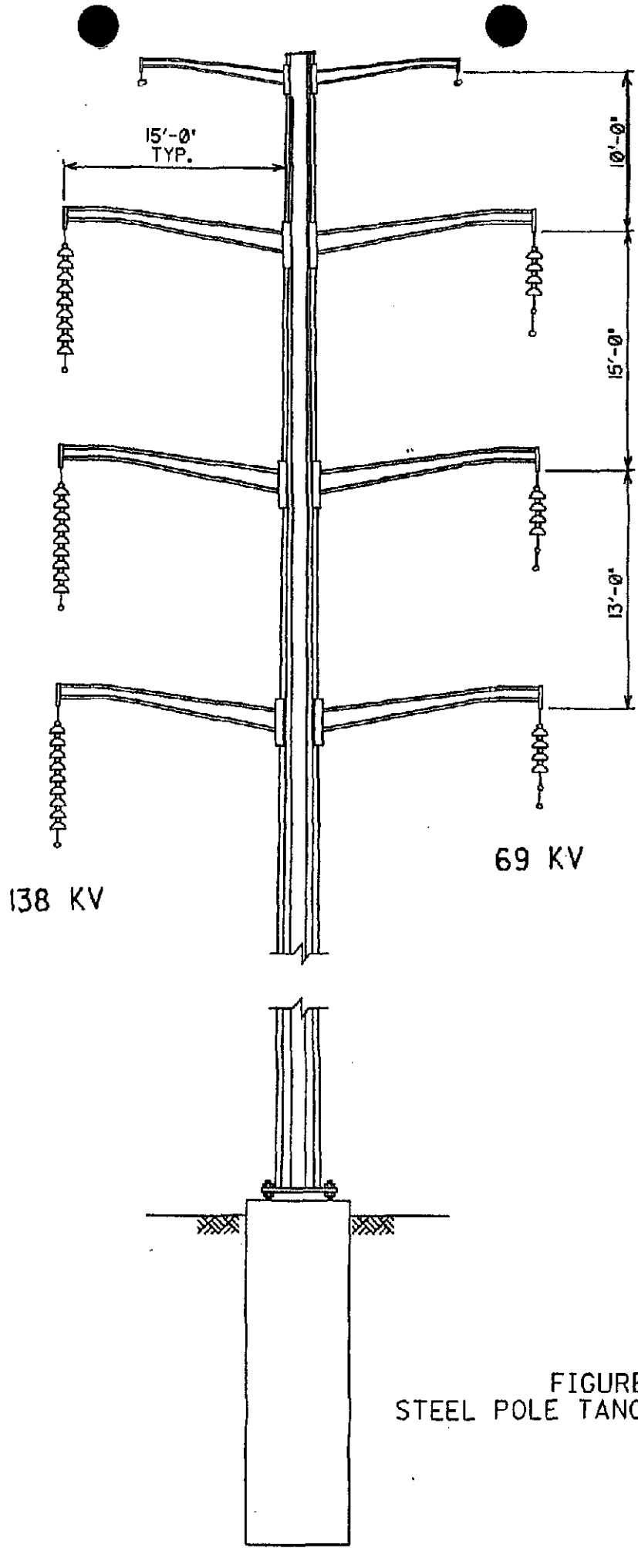


FIGURE 3
STEEL POLE TANGENT STRUCTURE

OVERSIZE DOCUMENT(S)

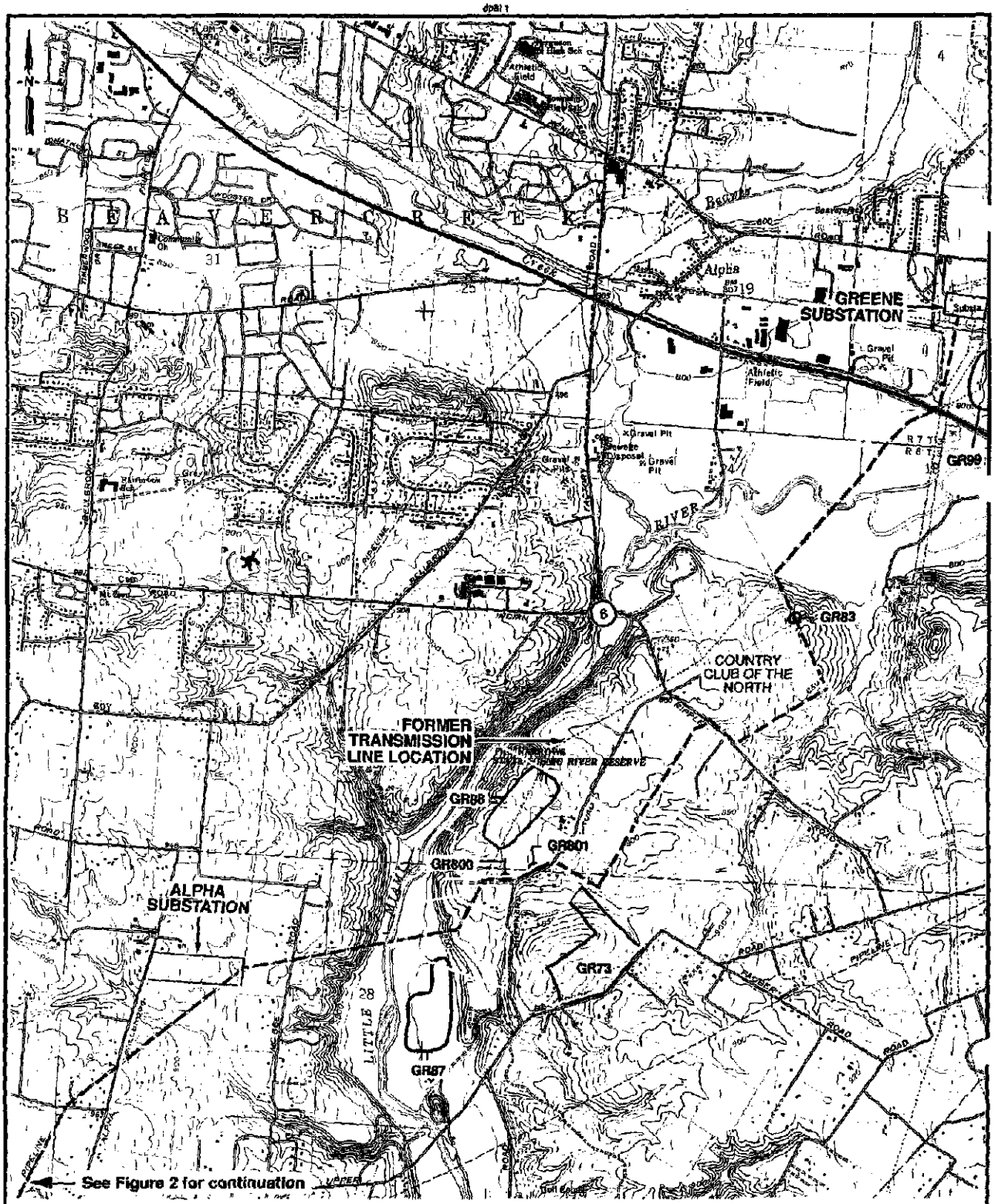
CASE NUMBER 94-1449-EL-BLN NUMBER OF IMAGES

DESCRIPTION

1. Map I - Reconductor CKT 13821
2. Map II DP&L Existing Transmission System
3. Map III DP&L Proposed Transmission System

REMOVED BY VT
DATE 8/31/94
SENT OUT

REVISED 3/14/89



LEGEND:

- Sugarcreek - Greene Electric Transmission Line
- (S) Threatened and Endangered Species Location
- GR88 Cultural Resource Location
- Agricultural District Land

OHIO

Quadrangle Location

NOTE: Recorded cultural resource sites are keyed into Table 1.

BASE MAP SOURCE: USGS 7 1/2 minute topographic quadrangle map Bellbrook, Ohio 1965, photorevised 1991.

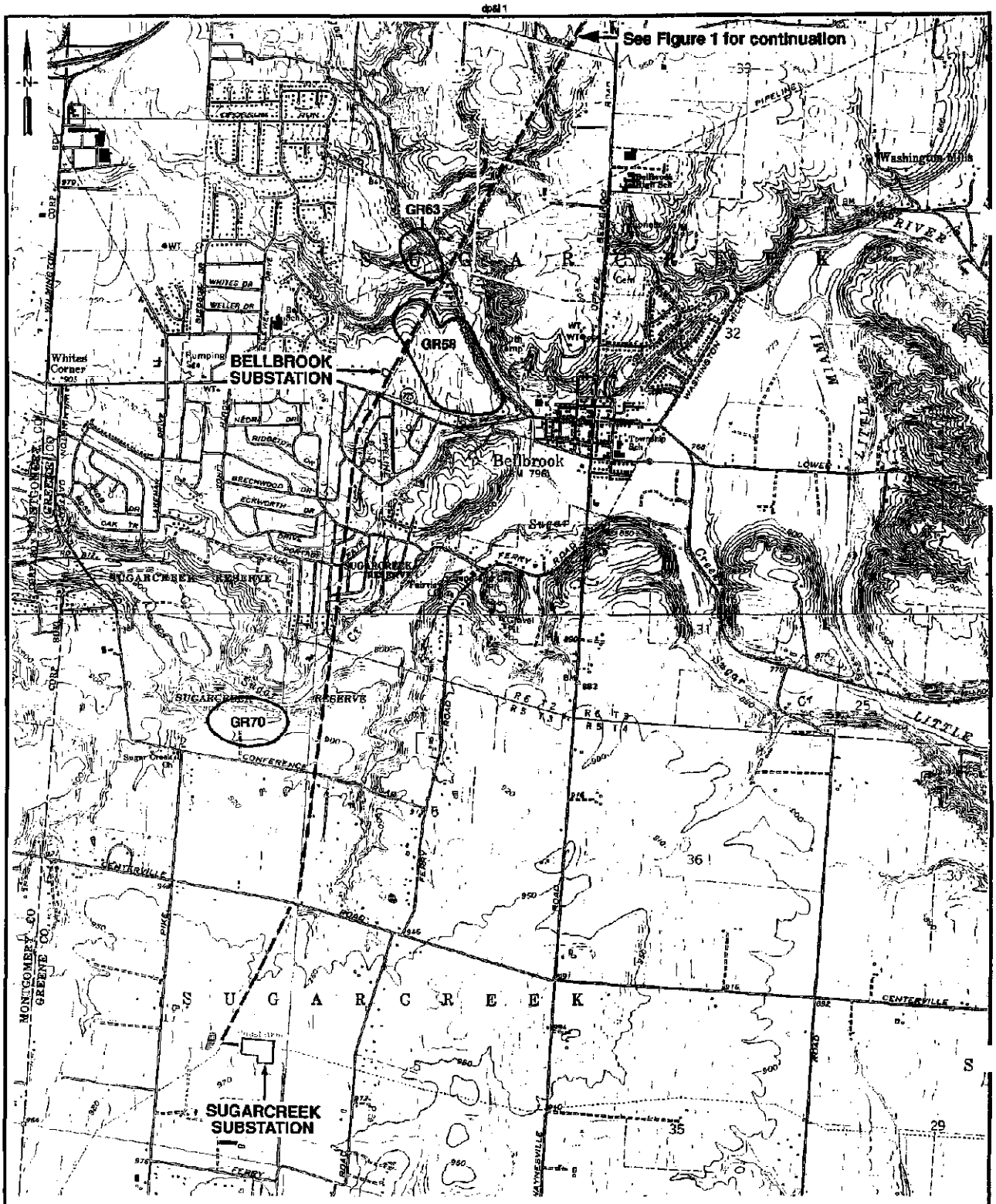
0 2000 4000

SCALE IN FEET

DP&L

DAYTON POWER AND LIGHT COMPANY
SUGARCREEK-GREENE FACILITY UPGRADE
GREENE COUNTY, OHIO

FIGURE 1
CULTURAL AND ECOLOGICAL FEATURES, LAND USE


See Figure 1 for continuation
GR63
GR58
GR70
BELLBROOK SUBSTATION
SUGARCREEK SUBSTATION
Bellbrook
Washington Mills
Whites Corner
SUGARCREEK RESERVE
SUGARCREEK
GREENE
MONTGOMERY CO.
CENTERVILLE
CONFERENCE
FERRY ROAD
PIPELINE
MIAMI
LITTLE
RIVER
WASHINGTON
WAYNESVILLE
LEGEND:
Sugarcreek - Greene Electric Transmission Line
GR88 Cultural Resource Location
Agricultural District Land
OHIO
Quadrangle Location
NOTE: Recorded cultural resource sites are keyed into Table 1.
BASE MAP SOURCE: Compiled from the following USGS 7 1/2 minute topographic quadrangle maps: Bellbrook, Ohio 1965, photorevised 1991; Waynesville, Ohio 1968, photorevised 1981.
0 2000 4000
SCALE IN FEET
DP&L
DAYTON POWER AND LIGHT COMPANY
SUGARCREEK-GREENE FACILITY UPGRADE
GREENE COUNTY, OHIO
FIGURE 2
CULTURAL AND ECOLOGICAL FEATURES, LAND USE