

2.2 LAND

This section describes the Clinch River Nuclear (CRN) Site and land use in the vicinity and region of the CRN Site. The CRN Site is located in Roane County in eastern Tennessee (Figure 2.1-1), and is accessible by road and river. Interstate (I-) 40 connects Knoxville and Kingston, Tennessee, and its closest point to the CRN Site is approximately 0.6 miles (mi) southeast of the nearest site boundary, across the Clinch River arm of Watts Bar Reservoir (Figure 2.1-2). Additional interstate highways in the CRN Site region include I-75, I-640, and I-140 (Figure 2.1-1). Nearby state roads include Tennessee State Highway (TN) 58, TN 95, TN 327, TN 61, TN 70, and TN 321 (Figure 2.1-2). A privately-owned rail spur (EnergySolutions Heritage Railroad) is located approximately 2.5 mi north-northwest of the center of the CRN Site, northwest of TN 58 (Reference 2.2-1). The CRN Site is accessed from TN 58 or TN 95 via Bear Creek Road (Figure 1.1-2).

2.2.1 The Site and Vicinity

2.2.1.1 The Site

The center of the CRN Site is located approximately 10.7 mi southwest of the City of Oak Ridge, Tennessee, business district (Figure 1.1-1) and lies within the Oak Ridge city limits. The CRN Site center point is approximately 25.2 mi west-southwest of downtown Knoxville, Tennessee. The Clinch River arm of the Watts Bar Reservoir surrounds the CRN Site on the south, west, and much of the eastern sides. The majority of the CRN Site is located on a peninsula on the north bank of the Clinch River arm of the Watts Bar Reservoir, located between approximately Clinch River mile (CRM) 14.5 and CRM 19 (Reference 2.2-2). The primary entrance to the CRN Site is located adjacent to the Clinch River arm of the Watts Bar Reservoir along Bear Creek Road (Figure 2.2-1). The emergency egress road for the CRN Site intersects with the Jones Island Road on the Oak Ridge Reservation (ORR). The proposed configuration for the CRN Site is provided in Figure 2.1-3.

The Clinch River Property is the approximately 1200 acres (ac) of land adjacent to the Clinch River arm of the Watts Bar Reservoir owned by the federal government and managed by the Tennessee Valley Authority (TVA). The Clinch River Property includes the CRN Site, which is approximately 935 ac, and the Grassy Creek Habitat Protection Area (HPA). The Grassy Creek HPA is located north of the CRN Site as shown in Figure 2.2-1.

TVA directs the land management activities at the Clinch River Property in accordance with the Watts Bar Land Management Plan (Reference 2.2-3). TVA manages the property and mineral rights of the Clinch River Property. There are no known mineral resources, including oil and natural gas, within or adjacent to the CRN Site that are being exploited or are of any known value. The only known resource of value located within the CRN Site is limestone (which is not currently being exploited), and TVA owns the mineral rights for the CRN Site. (Reference 2.2-4)

Historic property uses on the CRN Site included several small farmsteads scattered across the CRN Site and the Clinch River Breeder Reactor Project (CRBRP) (Reference 2.2-5; Reference 2.2-6). Portions of the CRN Site were disturbed during the proposed CRBRP, as described in the CRN Site Land Use and Recreation Technical Report (Reference 2.2-7). The CRN Site was selected as the location for construction of a liquid metal fast breeder reactor in 1972. Site preparation for the CRBRP began in 1982 and was nearly complete in late 1983. (Reference 2.2-8) Approximately 240 ac of the current CRN Site were disturbed during site preparation for the CRBRP (Reference 2.2-9). CRBRP site preparation activities included leveling a ridge that originally reached 880 feet (ft) above mean sea level (msl) to 780 msl, excavation of the construction area, and installation of various structures and pads (Reference 2.2-8). The excavated area totaled approximately 24 ac in extent and extended to as much as 100 ft in depth (Reference 2.2-10). Approximately three million cubic yards of earth and rock were excavated during the CRBRP site preparation. Structures installed at the CRBRP site included a cement crane pad, quality control test laboratory, construction shops, concrete batch plants, and sediment ponds. An approximately 6450 foot long 8-inch (in.) water line from the U.S. Department of Energy's (DOE's) Bear Creek Filtration Plant was also installed at the CRBRP site. (Reference 2.2-8; Reference 2.2-9) The project was terminated in late 1983 and CRBRP site redress plans were developed and implemented. Measures to stabilize the CRBRP site included reseeding of grass, and planting of trees, mulching cleared areas, installation of straw bales in shallow ditches, installation of small berms of riprap in larger ditches, installation of culverts to direct water from steep slopes, and modification of the holding ponds for long-term stability (Reference 2.2-11). Portable buildings and structures were removed from the CRBRP site with the exception of the crane pad and meteorological tower (Reference 2.2-12). The approximately 6450 foot long 8-in. water line was terminated at a hydrant and left in place (Reference 2.2-13). The 80 foot by 80 foot crane pad was left in place (Reference 2.2-9; Reference 2.2-7) The excavated area was partially backfilled in a manner to sustain site drainage. Rock bolts within the excavated area were left in place. Level areas of the CRBRP site were graded and compacted. (Reference 2.2-14) The meteorological tower was removed by TVA in October 2013 (Reference 2.2-7).

The current Clinch River Property topography includes steep hills and flat meadows as shown in Figure 2.2-1. A series of roughly parallel ridges of gradually lower elevations stretches from the Chestnut Ridge, near the CRN Site entrance and in the Grassy Creek HPA, to approximately the center of the peninsula. The ridges within the CRN Site footprint are approximately 860 to 940 msl in elevation. Several small drainages descend from these ridges to the Clinch River arm of the Watts Bar Reservoir. The southeastern portion of the peninsula is a relatively flat plateau, with an elevation of approximately 780 msl. The plateau was created during the construction activities associated with the CRBRP. A few small hills are located in this portion of the CRN Site. The large depression from previous excavation work conducted as part of the former CRBRP is also located in this area. The northeastern portion of the CRN Site consists of interspersed rolling hills and meadows. Elevations in this part of the CRN Site range from approximately 780 msl at the meadows to 940 msl at the peaks of the hills. (Reference 2.2-7)

The CRN Site currently consists primarily of undeveloped land. Based on the U.S. Geological Survey (USGS) land-cover classification standards and the 2011 National Land Cover Database (NLCD), land use and land cover on ORR Site 3 is categorized and shown in Table 2.2-1 and Figure 2.2-2. Forested land (deciduous, evergreen, and mixed forest) accounts for approximately 48 percent of the CRN Site. Wetlands (emergent herbaceous and woody wetlands) occupy approximately 9 percent of the CRN Site. Other vegetated undeveloped land (grassland/herbaceous and shrub/scrub) occupies approximately 5 percent of the CRN Site. Land classified as cultivated crops and pasture/hay occupy approximately 27 percent of the CRN Site. Open water and barren land occupy approximately 4 percent of the CRN Site. Developed areas (high, medium, and low intensity, or open space) occupy approximately 7 percent of the CRN Site.

Modern soil survey data produced by the U.S. Department of Agriculture (USDA) in which prime farmland soils are classified are not available for the CRN Site or the adjacent ORR. A 1942 Soil Survey for Roane County includes the CRN Site and ORR. The 1942 Roane County soil survey provides soil productivity classifications based on soil suitability for various uses including cropland, pasture, and forest. Figure 2.2-3 shows the soil types on and around the CRN Site. The area previously impacted by the CRBRP excavations is shown on Figure 2.2-3. These soils have been disturbed. Table 2.2-2 lists the 1942 soil type classifications on the CRN Site and the ORR. Table 2.2-3 lists the 2009 soil types on non-federal lands in the area.

The modern prime farmland classification of soils should be similar to the first-class (good to excellent cropland) 1942 classification. There are no first-class soils within the CRN Site or in the immediate vicinity on the ORR. The only project activities using soils currently planned for the areas included in the 2009 soil survey would be the use of borrow pits for onsite fill, which are discussed in Subsection 2.2.3.

A Farmland Conversion Impact Rating (Form AD-1006) was completed by TVA in consultation with the USDA's Natural Resources Conservation Service to quantify the potential impacts to prime farmland. The impact rating considers the acreage of prime farmland to be converted, the relative abundance of prime farmland in the surrounding county, and other criteria such as distance from urban support services and built-up areas, potential effects of conversion on the local agricultural economy, and compatibility with existing agricultural use. Sites with a total score of at least 160 have the potential to adversely affect prime farmland. The impact rating score for the CRN Site was 102 points (Environmental Report Appendix A).

Limited infrastructure development and structures are present on the CRN Site. Near the center of the peninsula on the plateau, TVA has installed a gravel parking lot and several mobile trailers and support structures, for use as office and storage space. The Hensley Cemetery, a small private cemetery, is located on the south side of the peninsula along River Road (Figure 2.2-1). TVA currently does and would continue to maintain this cemetery. Family access to this cemetery is allowed and would continue to be allowed in the future. As described in Subsection 2.2.2, two power transmission lines cross the CRN Site (Reference 2.2-7).

Potable water for the CRN Site is provided by the City of Oak Ridge, Tennessee, Public Works Department. Wastewater from the site is treated by the City of Oak Ridge. Solid waste is managed by TVA's solid waste disposal vendor.

As manager of federal lands around TVA reservoirs, TVA establishes land use zones within reservoir management plans. The CRN Site zones were established under the policies set forth in the 2009 Watts Bar Reservoir Land Management Plan and the 2011 TVA Natural Resource Plan. The majority of the CRN Site is designated as Zone 2 – Project Operations. A strip along the reservoir shoreline is designated Zone 3 – Sensitive Resource Management. The Grassy Creek HPA (adjacent to the CRN Site) is designated Zone 3 – Sensitive Resource Management/Natural Area. (Reference 2.2-3)

The Federal Emergency Management Agency (FEMA) develops Flood Insurance Rate Maps to determine which areas are Special Flood Hazard Areas subject to inundation by the 1 percent annual chance flood. FEMA defines the 1 percent annual chance flood (100-yr flood), also known as the base flood, as the flood which has a 1 percent chance of being equaled or exceeded in any given year. FEMA also maps areas of minimal flood hazard as those potentially subject to the 0.2 percent annual chance flood (500-yr flood). The majority of the CRN Site lies outside both the 1-percent annual flood and 0.2 percent annual flood zones (Figure 2.2-9). Portions of the Barge/Traffic area (on the south side of Bear Creek Road) lie within both the 1-percent and 0.2-percent annual flood zones. Flooding potential exists in the immediate vicinity of the CRN Site along the banks of the Clinch River arm of Watts Bar Reservoir at elevations up to 752 ft. (Reference 2.2-30; Reference 2.2-31)

2.2.1.2 The Site Vicinity

The CRN Site is located entirely within Roane County. The northwestern portion of Loudon County and part of the southwestern portion of Anderson County are included within the CRN Site vicinity, defined as a 6-mi radius from the center of the CRN Site (Figure 2.1-2).

The vicinity of the CRN Site is primarily rural, consisting of forest and pasture/hay (Figure 2.2-4). Based on the USGS land-cover classification standards and the 2011 NLCD, land use and land cover in the CRN Site vicinity is categorized and shown in Table 2.2-1 and Figure 2.2-4. Forested land (deciduous, evergreen, or mixed forest) accounts for approximately 54 percent of the CRN Site vicinity. Wetlands (emergent herbaceous or woody wetlands) occupy approximately 3 percent of the CRN Site vicinity. Other vegetated undeveloped land (grassland/herbaceous or shrub/scrub) totals approximately 5 percent of the CRN Site vicinity. Land classified as cultivated crops and pasture/hay total approximately 20 percent of the CRN Site vicinity. Open water or barren land occupy approximately 4 percent of the CRN Site vicinity. The remaining approximately 14 percent of the CRN Site vicinity is classified as developed (high, medium, or low intensity, or open space).

Approximately 18,000 ac or 7.5 percent soils in the surveyed portions of Roane County could be considered prime farmland (Reference 2.2-15). According to the Watts Bar Reservoir Land

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Management Plan, which describes existing land use for TVA-managed land on Watts Bar Reservoir, including the CRN Site, there are approximately 2900 ac of prime farmland located on reservoir lands (Reference 2.2-3).

Several commercial/industrial properties are located on north of the CRN Site along Bear Creek Road in the Clinch River Industrial Park, as depicted in Figure 2.1-2. A portion of these properties are located on TVA land designated Zone 5 – Industrial. The 161-kilovolt (kV) transmission line exits the CRN Site near the entrance gate and connects with a power substation located just outside the gate (Figure 2.2-1) (Reference 2.2-7).

The CRN Site is bounded on the northeastern side by the ORR (Reference 2.2-7). Land within the ORR is used for multiple purposes. Much of the ORR is undeveloped and consists of forested areas, grasslands and old agricultural fields, bottomlands and wetlands, utility corridors, and ridges in which a number of caves are present (Reference 2.2-16). The National Environmental Research Park and the Oak Ridge State Wildlife Management Area are both located within the ORR. These areas include wildlife management and habitat management plans. (Reference 2.2-16) Facilities within the ORR currently include the Oak Ridge National Laboratory (ORNL), the Y-12 National Security Complex, and the East Tennessee Technology Park (ETTP; Figure 2.1-2). Land uses surrounding the facilities include safety, security, and emergency planning zones; research and education areas; cleanup and remediation sites; environmental regulatory monitoring areas; wildlife management; biosolids land application; protection of cultural and historic resources; wildland fire prevention; land stewardship activities; restoration infrastructure; and public areas. The ORR 10-year (yr) site plan for land use management across the reservation was published in 2007. The 10-yr plan indicates that ORR will, in most cases, expand and build on current land uses. The 10-yr site plan includes the results of a 2002 land use planning focus group report. (Reference 2.2-17; Reference 2.2-18) In 2002, ORR identified potential surplus land in the northwest portion of the reservation (including areas northwest of the Clinch River Industrial Park and surrounding the ETTP). A focus group reviewed the land use planning associated with this potential surplus land, the public and stakeholders participated in the process. The focus group concluded with three recommendations related to ORR land use planning. The first recommendation was for the preservation of areas designated for green space/conservation within the potential surplus land area. The second recommendation was to expand the land use planning process for the remainder of the ORR. The third recommendation called for the use of a biodiversity analysis in addition to the socioeconomic impact analysis that was conducted. (Reference 2.2-19)

The south bank of the Clinch River arm of the Watts Bar Reservoir, from the Melton Hill Dam upstream of the CRN Site to beyond TN 58 downstream of the CRN Site, is largely residential with some small private pastures and farm fields. Many residences include several acres of property. The area is sparsely wooded. (Reference 2.2-7)

The Roane Regional Business and Technology Park is located approximately one-half mile east of the CRN Site, on Industrial Park Road, adjacent to I-40. This business park occupies approximately 655 ac and has several operating facilities and vacant space. Current tenants

include food distribution, tool, engineering, ceramics, roofing, energy, engine parts, and automotive companies. The industrial park also contains sites available for development. (Reference 2.2-20)

Several recreational areas are located in the immediate CRN Site vicinity. These include Melton Hill Dam Recreation Area, the Soaring Eagle Campground and RV Park, the Gallaher Recreation Area, the ORR which is a Tennessee Wildlife Management Area, the ETTP Visitor's Overlook, the Southern Appalachia Railway Museum, the Wheat Community African Burial Ground, several hiking trails and greenways, and boating and fishing activities on the Clinch River arm of Watts Bar Reservoir and Melton Hill Reservoir (Figure 2.1-2). (Reference 2.2-7) Recreational land use is discussed in detail in Subsection 2.5.2.5 Aesthetics and Recreation.

The CRN Site is located within the city limits of Oak Ridge, Tennessee, making Oak Ridge the closest city in the vicinity of the CRN Site. The City of Oak Ridge has an extensive zoning ordinance and plan. However, although the CRN Site is within the city limits, Oak Ridge zoning ordinances do not apply to federal property.

No operating airports or ports are located within the 6-mi CRN Site vicinity.

2.2.2 The Region

The CRN Site region is defined as the area within a 50 mi radius of the center of the CRN Site (Figure 2.1-1). There are 33 counties at least partially within 50-mi of the center point of the CRN Site. Three of these counties are in North Carolina, two are in Kentucky, and the rest are in Tennessee (Figure 1.1-1). The largest city in the 50-mi radius is Knoxville, Tennessee. As of the 2010 Census, the population of Knoxville was 178,874 persons. All of the other cities and towns in the region have populations of less than 50,000. Other than Knoxville, only three cities have populations of over 20,000: Oak Ridge (29,330), Maryville (27,601) and Farragut (20,676), Tennessee.

Four interstate highways traverse the region, I-40, I-75, I-640, and I-140 (Figure 2.1-1). Subsection 2.5.2.2, Transportation, provides a description of the transportation network in the vicinity of the CRN Site. The Clinch River provides a navigable corridor between Clinton, Tennessee and Kingston, Tennessee, where it joins with the Tennessee River (Watts Bar Reservoir) and thus ultimately provides transport to the Gulf of Mexico (Reference 2.2-21). The Clinch River (Melton Hill Reservoir) is designated a state scenic river from above the Melton Hill Dam to below the Norris Dam (Reference 2.2-22). The closest commercial airports located within the CRN region are the McGhee Tyson Airport and the Knoxville Downtown Island Airport (Figure 2.1-1).

Based on the USGS land-cover classification standards and the 2011 NLCD, land use and land cover in the CRN Site vicinity is categorized and shown in Table 2.2-1 and Figure 2.2-5. Forested land (deciduous, evergreen, or mixed forest) accounts for approximately 62 percent of the region. Wetlands (emergent herbaceous or woody wetlands) occupy less than 1 percent of

the region. Other vegetated undeveloped land (grassland/herbaceous or shrub/scrub) totals approximately 8 percent of the region. Land classified as cultivated crops and pasture/hay totals approximately 16 percent of the region. Open water or barren land occupy approximately 3 percent of the region. The remaining approximately 11 percent of the region is classified as developed (high, medium, or low intensity, or open space). According to the USDA, in 2007 Anderson County's top crop in terms of acreage was forage (9160 ac) and the top livestock inventory items were cattle and calves, producing a total of 4.4 million dollars of agricultural products that year (Reference 2.2-23). In Roane County, the top crop was also forage (11,383 ac) and the top livestock items were cattle and calves, producing a total of 5.1 million dollars of agricultural products (Reference 2.2-24). In Loudon County the top crop is forage (21,136 ac) and the top livestock items are also cattle and calves, producing 60 million dollars of agricultural products (Reference 2.2-25). Knox County has a similar agricultural regime, with forage the top crop (21,673 ac) and cattle and calves the top livestock, producing a total of 19 million dollars of agricultural products (Reference 2.2-26).

Federal lands in the region include the ORR, the Watts Bar Dam Reservation, the Melton Hill Dam Reservation, Great Smoky Mountains National Park, Cherokee National Forest, Big South Fork National River and Recreational Area, and Daniel Boone National Forest. Most of these federal lands offer camping, fishing, swimming, boating, and other recreational activities for visitors. The ORR includes three DOE campuses with distinct missions. The ORNL is the DOE's largest multi-purpose laboratory conducting research in advanced materials exploration, alternative fuels, climate change, and supercomputing. Two of the laboratory's more significant facilities include the Spallation Neutron Source facility, a center for neutron science research, and the High Flux Isotope Reactor, an 85-megawatt high flux reactor-based source of neutrons. The Y-12 Complex mission includes modernizing defense systems and reducing nuclear stockpiles worldwide. The East Tennessee Technology Park is located on the site of a former uranium enrichment complex, which is currently being remediated, revitalized, and transitioned into a private sector business/industrial park. Seasonal hunting activities are available on the ORR as well. (Reference 2.2-27)

2.2.3 Transmission Corridors and Offsite Areas

There are currently two transmission corridors crossing the CRN Site (Figure 2.2-6). The Kingston FP - Ft Loudoun HP 161 kV No.1 transmission line crosses the CRN Site from the southeastern tip of the peninsula to the northwestern corner of the CRN Site near the entrance gate. The Bull Run FP-Watts Bar NP 500 kV transmission line transverses the CRN Site northeast to southwest.

Onsite and offsite transmission lines are to be modified for the project. Onsite transmission lines are to be modified by relocating the 161 kV line to accommodate placement of the CRN facility. Offsite transmission lines are modified through the establishment of a 69kV underground transmission line from the Bethel Valley Substation to the CRN facility and upgrades needed to support stability of the TVA power grid. This 69 kV transmission line is to be placed within the existing 500 kV line right-of-way (Figure 2.2-6). Transmission line segments requiring upgrades

are shown in Figure 2.2-7. Ten 161 kV transmission lines over a distance of 191 mi would require uprating. An additional sixteen 161 kV transmission lines over a distance of 122 mi would require uprates or reconductoring. Modifications related to uprating and reconductoring would affect a total of 2317 and 1476 ac respectively. Finally, one section of a 12.7 mi long transmission line would require rebuilding covering a total of 154 ac. All actions related to offsite transmission line modifications would occur within the existing transmission line rights-of-way. Figure 2.2-10 shows the federal and tribal lands, wildlife areas and refuges, wilderness areas, and parks in the vicinity of these offsite transmission lines. Detailed information regarding changes associated with the transmission lines, including lengths of individual segments affected, is discussed in Section 3.7.

Additional offsite areas include the rail offloading area, the Barge/Traffic Area, and several existing borrow pits. TVA anticipates utilizing the EnergySolutions Heritage Railroad rail siding near the CRN Site for deliveries. The refurbishment of this rail siding is addressed in the DOE's *Environmental Assessment, Transfer of Land and Facilities Within the East Tennessee Technology Park and Surrounding Area, Oak Ridge, Tennessee (DOE/EA-1640)* (Reference 2.2-28).

Roadway improvements are required in the Barge/Traffic Area and an existing barge terminal (that was used for TN 58 construction) in that area is to be refurbished (Figure 2.2-6). Based on the USGS land-cover classification standards and the 2011 NLCD, land use and land cover in the Barge/Traffic Area is categorized and shown in Table 2.2-1 and Figure 2.2-5. Forested land (deciduous, evergreen, or mixed forest) accounts for approximately 53 percent of the Barge/Traffic Area. Wetlands (emergent herbaceous or woody wetlands) occupy approximately 5 percent of the Barge/Traffic Area. Other vegetated undeveloped land (grassland/herbaceous or shrub/scrub) totals less than 1 percent of the Barge/Traffic Area. Land classified as cultivated crops and pasture/hay total approximately 16 percent of the Barge/Traffic Area. Open water or barren land occupy approximately 5 percent of the Barge/Traffic Area. The remaining approximately 21 percent of the Barge/Traffic Area is classified as developed (high, medium, or low intensity, or open space). The Barge/Traffic Area and the rail offloading area are located within the 6 mi CRN Site vicinity.

Fill material will be required for the CRN Site. In addition to potentially using borrow material from the CRN Site, offsite borrow sources may be used. The volume of fill material and selection of the source for fill material will be dependent on the backfill plan and the required material properties identified by analyses performed in support of the COLA. Material excavated from portions of the CRN Site will be characterized in accordance with the backfill plan to determine whether the material has the characteristics and provides the needed quantities for use as fill on the site. If additional fill material is need from offsite, the borrow source(s) will be selected based on material properties and quantities available at the potential source locations. The soil quality at each potential borrow site will be required to meet the criteria for acceptability for use as fill material at the CRN Site.

Offsite borrow areas that have been identified for possible use are shown in Figure 2.2-8. At least two of the borrow sites identified in Figure 2.2-8 are currently being utilized in support of other TVA projects. The total acreage of these nine potential borrow sites is 227 ac. The combined volume of fill material present in the disturbed and fully permitted offsite borrow areas is anticipated to meet the volume of fill material that would be needed for the CR SMR Project. Therefore, it is unlikely that any existing borrow areas would need to be expanded beyond currently permitted boundaries or that any new borrow areas would need to be opened to accommodate the CR SMR Project.

The borrow pits are located within the 50 mi CRN Site region.

2.2.4 References

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Table 2.2-1
USGS Land-Use Categories for the CRN Site and Surrounding Areas

USGS Description	CRN Site		Barge/Traffic Area		6-Mile Radius		50-Mile Radius	
	CRN Site (ac)	Percent of Land Use (%)	Barge/Traffic Area (ac)	Percent of Land Use (%)	Vicinity (ac)	Percent of Land Use (%)	Region (ac)	Percent of Land Use (%)
Barren Land (Rock/Sand/Clay)	20	2	1	<1	255	<1	15,396	<1
Cultivated Crops	8	1	4	2	94	<1	57,767	1
Deciduous Forest	320	34	102	50	33,452	46	2,393,380	48
Developed, High Intensity	1	<1	2	1	658	1	18,187	<1
Developed, Medium Intensity	6	1	16	8	2996	4	144,325	3
Developed, Low Intensity	19	2	21	10	1323	2	56,021	1
Developed, Open Space	42	4	4	2	4933	7	327,463	7
Emergent Herbaceous Wetlands	0	0	2	1	24	<1	1682	<1
Evergreen Forest	67	7	7	3	3595	5	321,477	6
Grassland/Herbaceous	26	3	1	1	2942	4	277,539	6
Mixed Forest	62	7	0	0	2152	3	391,240	8
Open Water	16	2	9	4	2353	3	136,732	3
Pasture/Hay	245	26	28	14	15,139	21	746,414	15
Shrub/Scrub	20	2	0	0	507	1	113,803	2
Woody Wetlands	83	9	9	3	1967	3	22,033	<1
Total	935	100	203	100	72,389	100	5,023,459	100

Note: The offsite portion of the 69-kV underground transmission line would be installed within an approximately 210-ac portion of an existing 500-kV transmission line right-of-way that is entirely within the 6-mi vicinity radius.

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Table 2.2-2 (Sheet 1 of 2)
1942 Soil Survey for Roane County, Tennessee

Soil	Description	Productivity Classification
Al	Atkins very fine sandy loam	Fourth-class
As	Armuchee silt loam	Fifth-class
Av	Apison very fine sandy loam	Second-class
Avk	Apison very fine sandy loam, eroded slope phase	Fifth-class
Avr	Apison very fine sandy loam, eroded phase	Fifth-class
Cc	Clarksville cherty silt loam	Third-class
Cch	Clarksville cherty silt loam, smooth phase	Third-class
Ccl	Clarksville cherty silt loam, hilly phase	Fourth-class
Ccz	Clarksville cherty silt loam, steep phase	Fifth-class
Clx	Colbert silt loam, slope phase	Fourth-class
Cs	Colbert silty clay loam	Fourth-class
Fc	Fullerton cherty silt loam	Third-class
Fch	Fullerton cherty silt loam, smooth phase	Second-class
Fcl	Fullerton cherty silt loam, hilly phase	Fourth-class
Fcr	Fullerton cherty silt loam, eroded phase	Third-class
Fct	Fullerton cherty silt loam, eroded hilly phase	Fifth-class
Fcz	Fullerton cherty silt loam, steep phase	Fifth-class
Gs	Greendale silt loam	Second-class
Jg	Jefferson gravelly fine sandy loam	Third-class
Jgx	Jefferson gravelly fine sandy loam, slope phase	Third-class
Ls	Lehew strong (or stoney) fine sandy loam	Fifth-class
Lv	Leadvale very fine sandy loam	Second-class
MI	Melvin silt loam	Fourth-class
Nvc	Nolichucky very fine sandy loam	Second-class
Nvr	Nolichucky very fine sandy loam, eroded phase	Third-class
PI	Pope loamy fine sand	Third-class
Pv	Pope very fine sandy loam	Second-class
Rg	Roane gravelly loam	Third-class
Rga	Rough gullied land, apison soil material	Fifth-class
Rgf	Rough gullied land, Fullerton soil material	Fifth-class
RsC	Rolling stony land, Colbert and Talbott soil material	Fourth-class
Rs	Rough stony land	Fifth-class
RsT	Rough stony land, Talbott soil material	Fifth-class
Sv	Sequatchie very fine sandy loam	Second-class
Ts	Talbott silty clay loam	Third-class
Tsh	Talbott silty clay loam, smooth phase	Second-class
Tsl	Talbott silty clay loam, hilly phase	Fifth-class

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Table 2.2-2 (Sheet 2 of 2)
1942 Soil Survey for Roane County, Tennessee

Soil	Description	Productivity Classification
Us	Upshur silty clay loam, valley phase	Fourth-class
Ws	Wolftever silt loam	Second-class
Wsx	Wolftever silt loam, slope phase	Second-class
Wvb	Waynseboro very fine sandy loam, eroded hill phase	Fourth-class
Wvx	Waynseboro very fine sandy loam, slope phase	Third-class

Notes:

First-class = good to excellent cropland

Second-class = fair to good cropland

Third-class = poor to fair cropland

Fourth-class = best suited to pasture, poorly adapted to cropland

Fifth-class = best suited to forest

Source: (Reference 2.2-29)

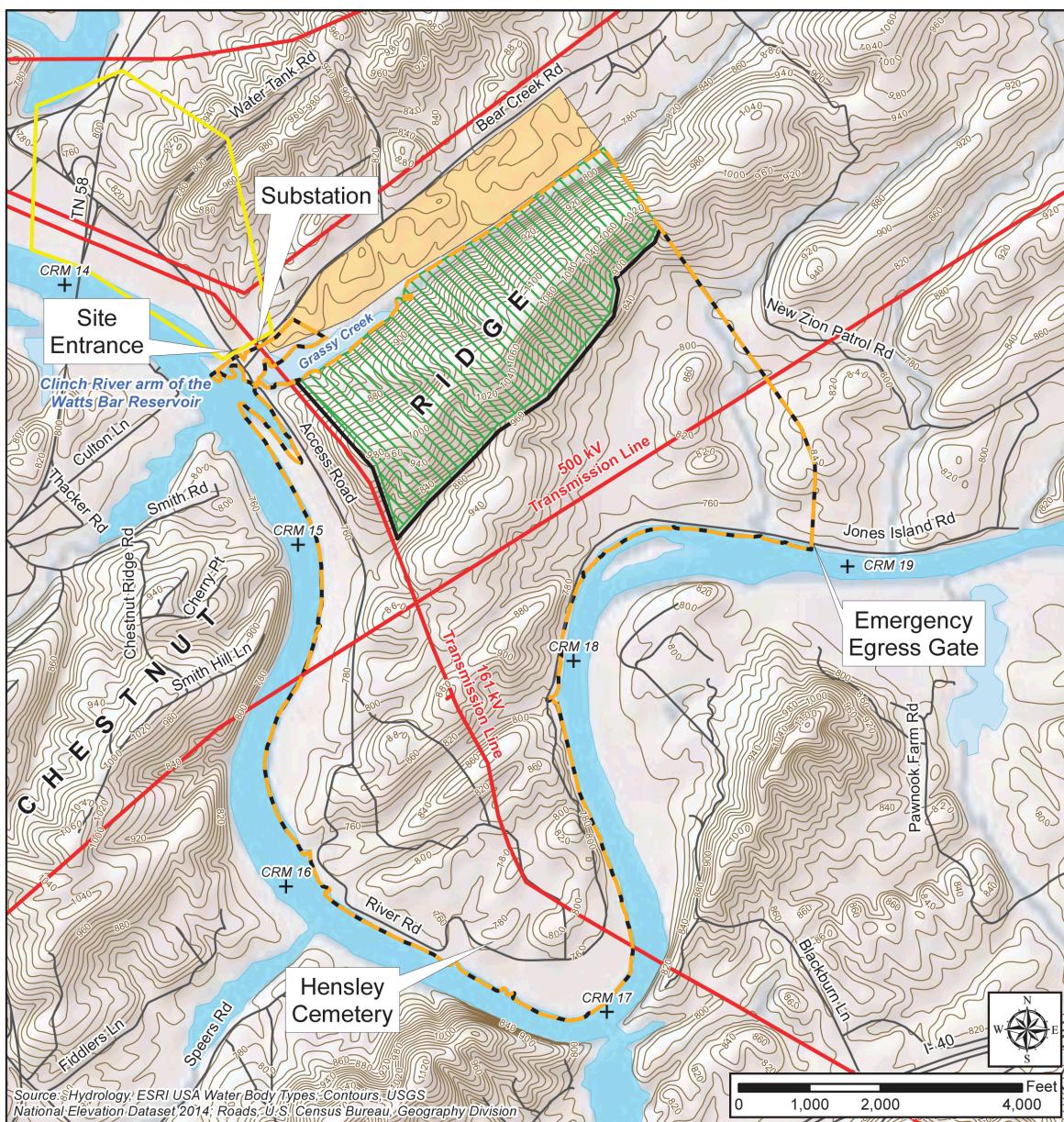
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Table 2.2-3
2009 Soil Survey for Roane County, Tennessee

Soil	Description	Prime Farmland
AeD	Allen loam, 12 to 20 percent slopes	No
AmC	Armuchee silt loam, 5 to 12 percent slopes	No
AmD	Armuchee silt loam, 12 to 20 percent slopes	No
AmE	Armuchee silt loam, 20 to 35 percent slopes	No
Bg	Bloomingdale silty clay loam, occasionally flooded	No
CbD	Colbert-Lyerly-Rock outcrop complex, 5 to 20 percent slopes	No
DeC	Dewey silt loam, 6 to 15 percent slopes	No
DeD	Dewey silt loam, 15 to 25 percent slopes	No
EtC	Etowah silt loam, 6 to 12 percent slopes	No
FuC	Fullerton-Pailo complex, 5 to 12 percent slopes	No
FuD	Fullerton-Pailo complex, 12 to 20 percent slopes	No
FuE	Fullerton-Pailo complex, 20 to 35 percent slopes	No
MnC	Minvale gravelly silt loam, 5 to 12 percent slopes	No
MoD	Montevallo channery silt loam, 12 to 20 percent slopes	No
MoE	Montevallo channery silt loam, 20 to 35 percent slopes	No
TeC	Townley silt loam, 5 to 12 percent slopes	No
TeD	Townley silt loam, 12 to 20 percent slopes	No
WaC	Waynesboro loam, 5 to 12 percent slopes	No
WaD	Waynesboro loam, 12 to 20 percent slopes	No
CaB	Capshaw silt loam, 2 to 5 percent slopes	Yes
EtB	Etowah loam, 2 to 6 percent slopes	Yes
Ha	Hamblen silt loam, occasionally flooded	Yes
WaB	Waynesboro loam, 2 to 5 percent slopes	Yes
WhB	Whitwell loam, 1 to 4 percent slopes, occasionally flooded	Yes

Source: (Reference 2.2-15)

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Legend

+ Clinch River Mile (CRM)	[Yellow Box] Barge/Traffic Area	[Red Line] Transmission Line
[White Box] CRN Site	[Orange Box] Clinch River Industrial Park	[Black Line] Local Road
[Blue Box] Rivers and Lakes	[Green Box] Grassy Creek Habitat Protection Area	[Grey Line] 20' Contour Lines
[Dashed Orange Box] Clinch River Property		

Figure 2.2-1. CRN Site Topographic Map

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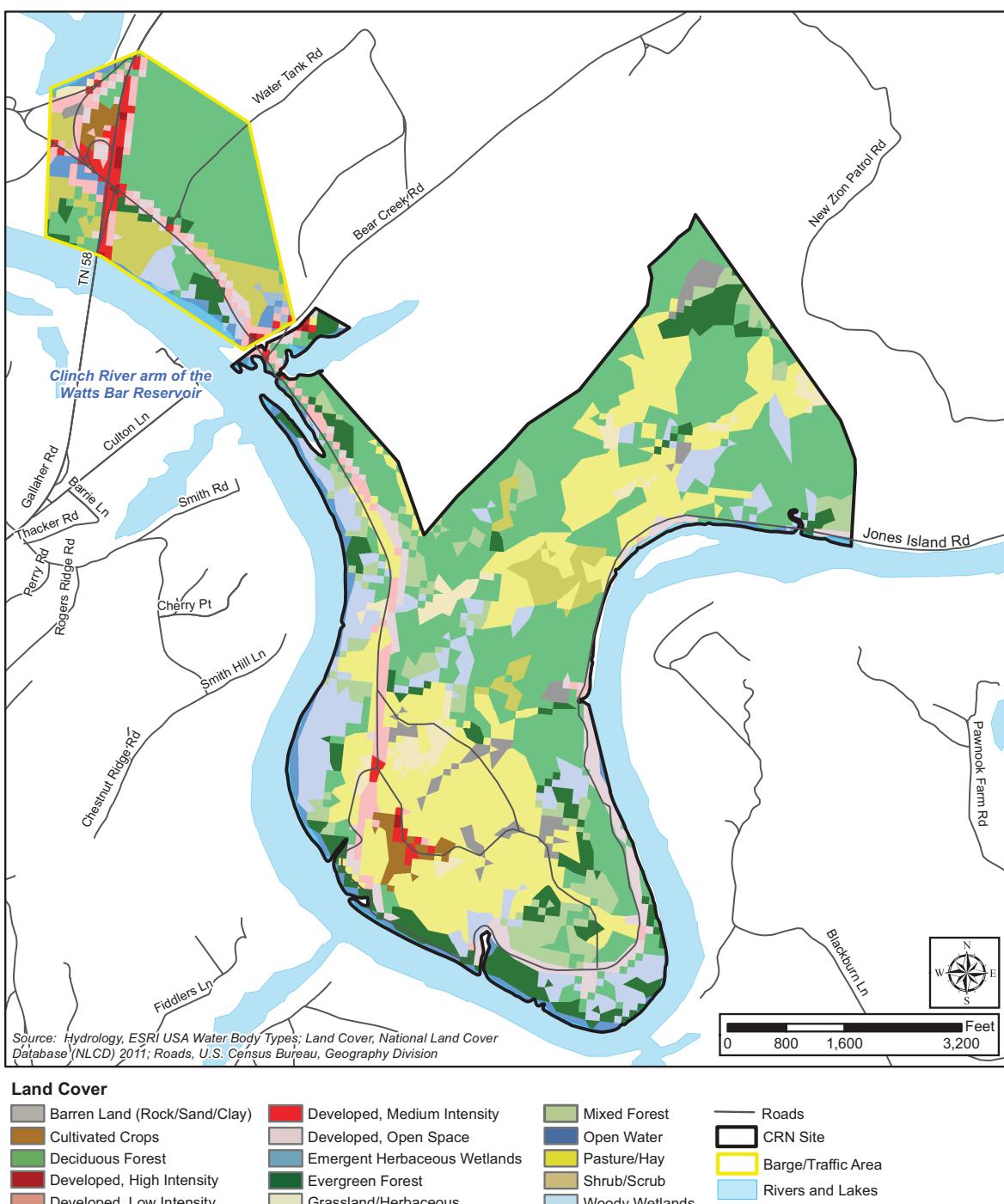


Figure 2.2-2. CRN Site Land Cover Types

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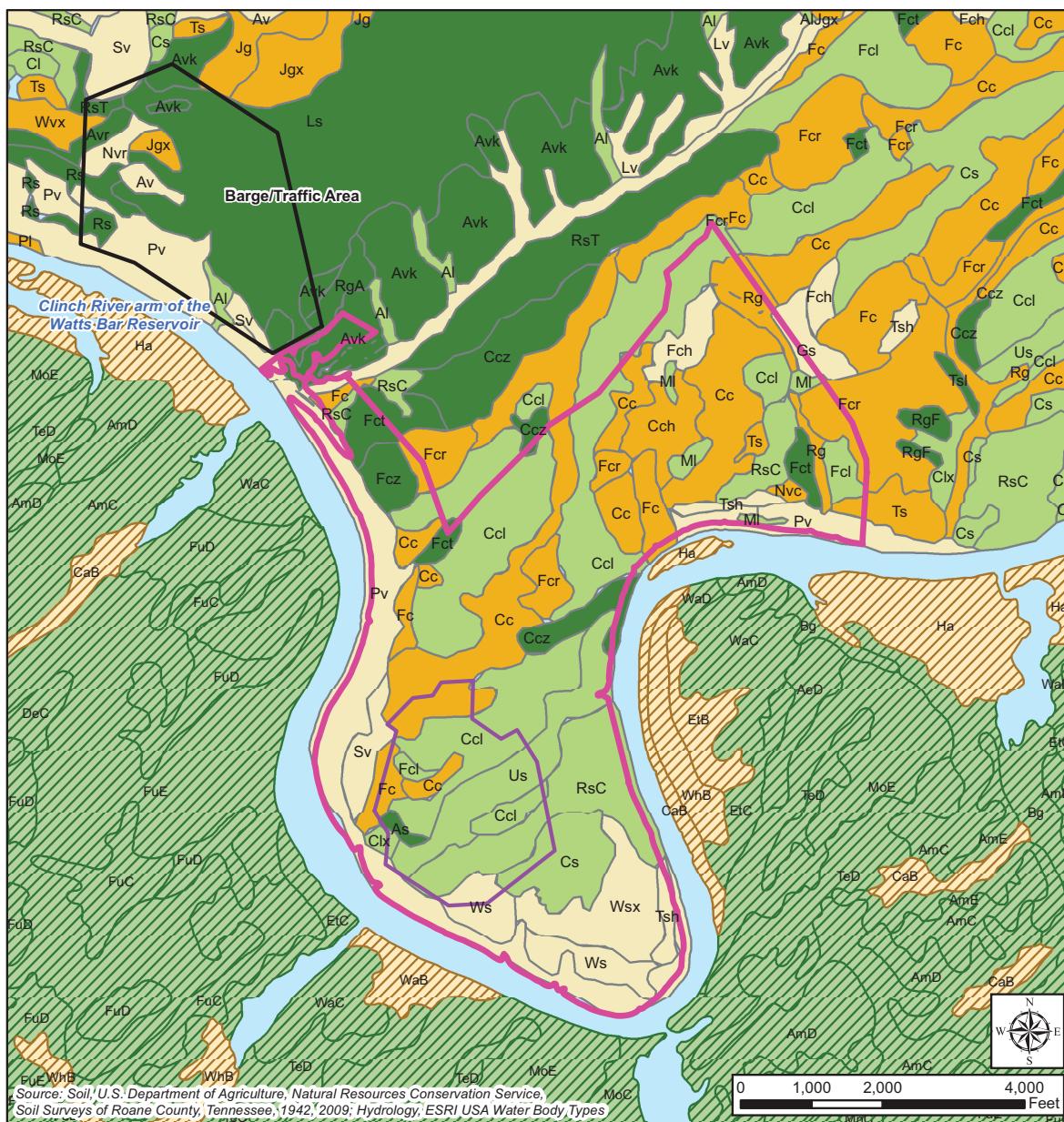
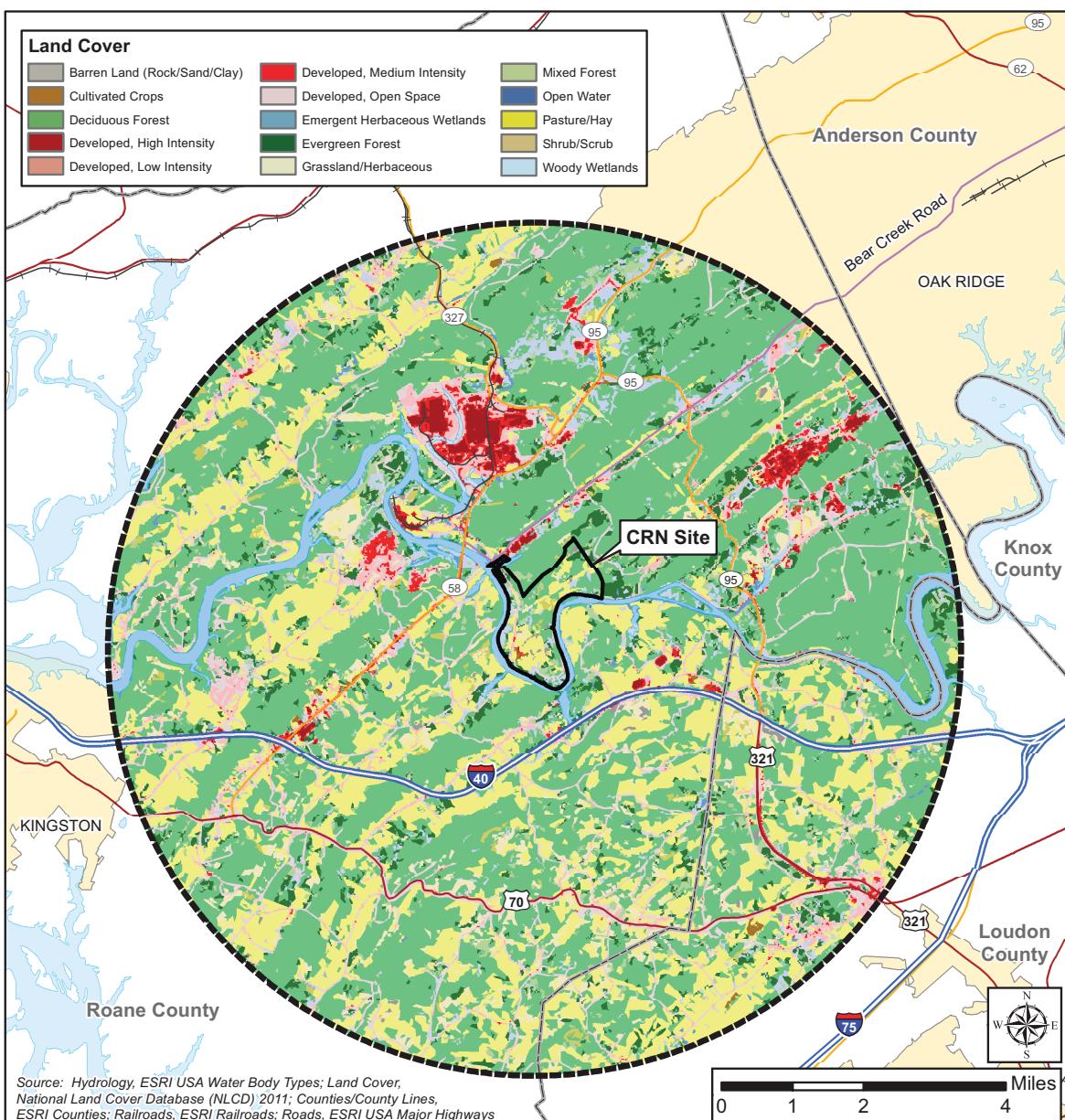


Figure 2.2-3. CRN Site Prime Farmland Soils

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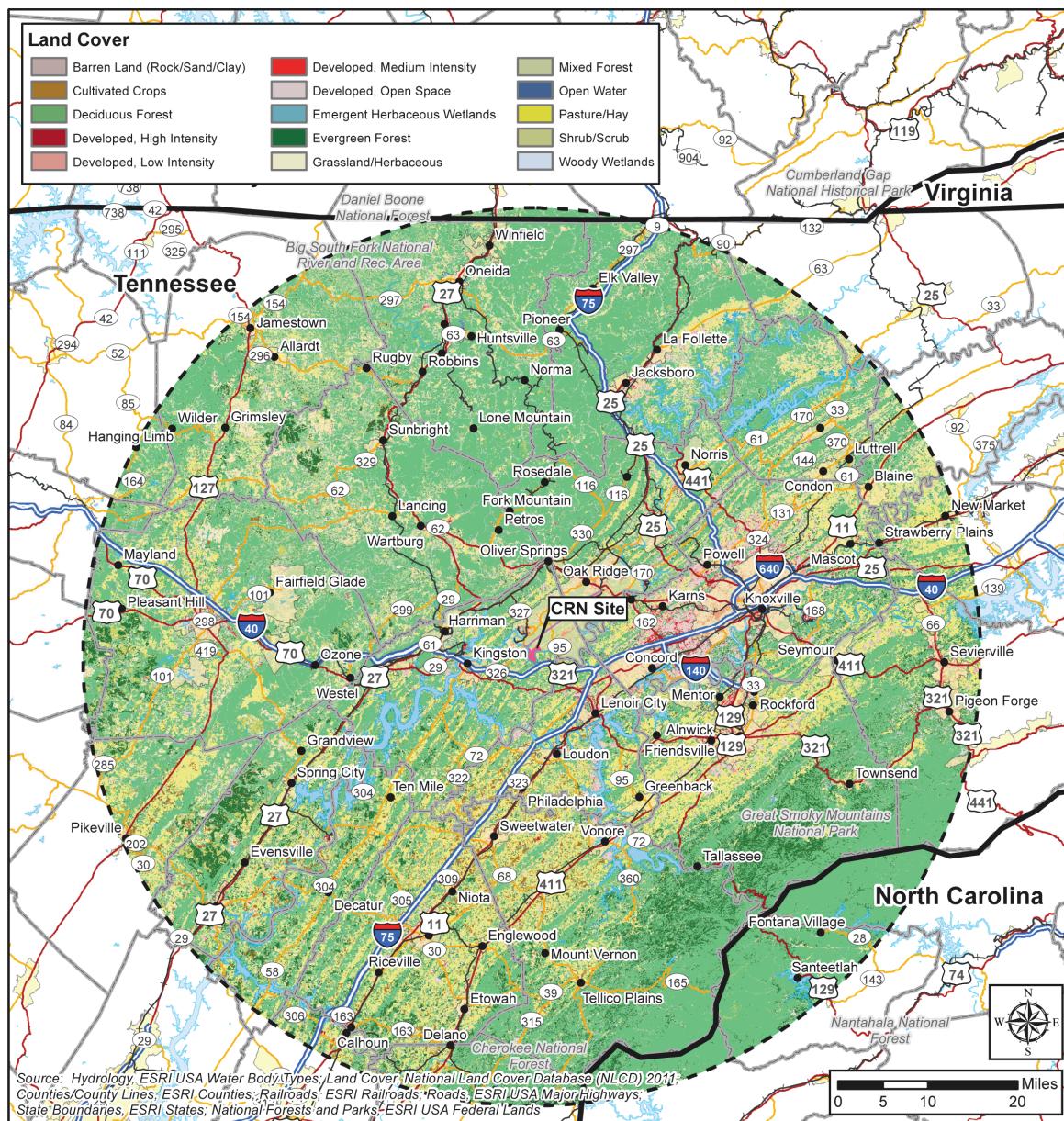


Legend

6-Mile Radius	Rivers and Lakes	Highway	Bear Creek Road
CRN Site	—+— Railroad	— Major Road	
City/Town Boundaries	— Interstate		
Counties			

Figure 2.2-4. CRN Site 6-Mile Vicinity Land Cover Map

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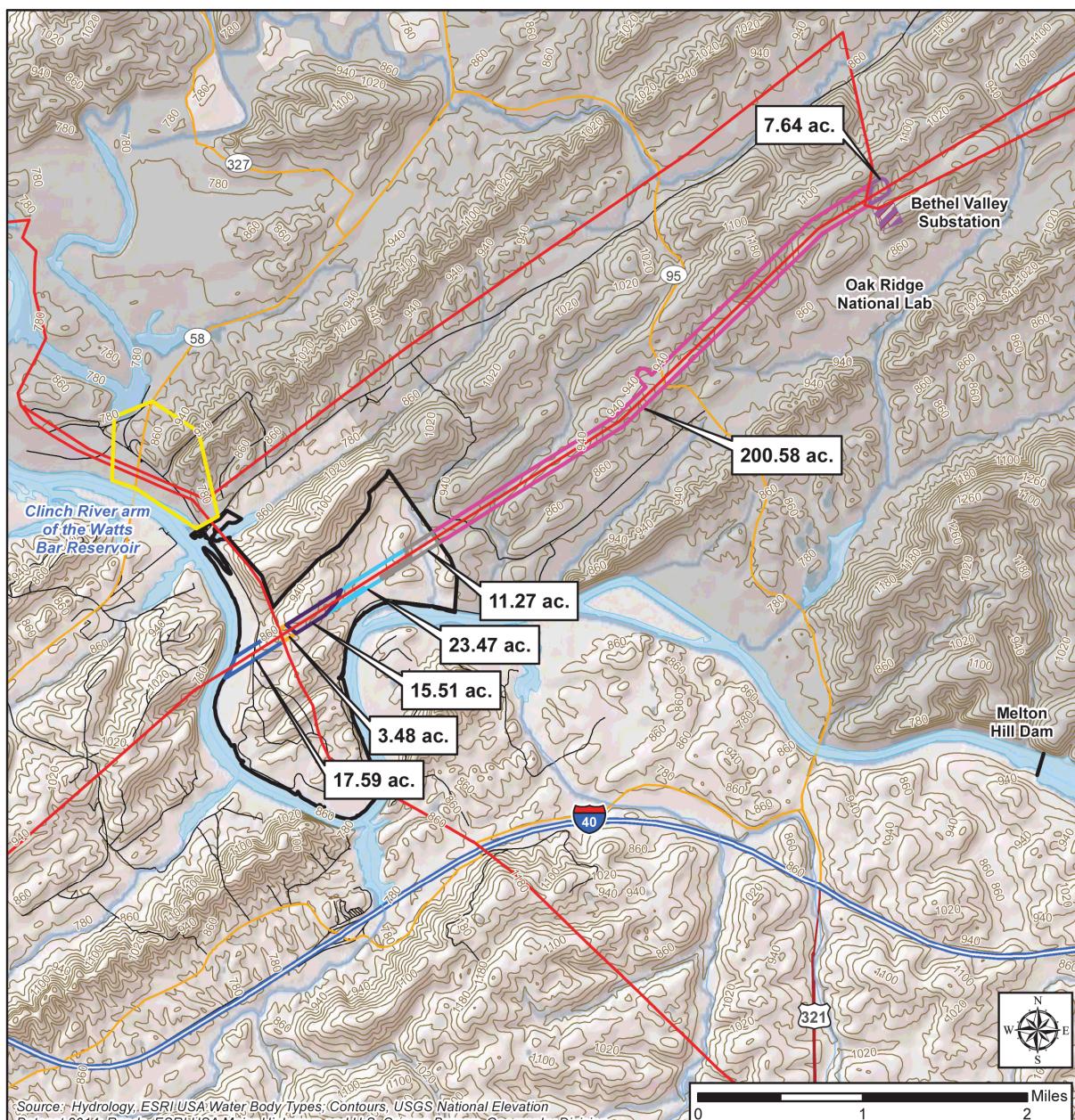


Legend

50-Mile Radius	Rivers and Lakes	Highway
CRN Site	—+— Railroad	— Major Road
Counties	— Interstate	— Bear Creek Road
State Boundaries		

Figure 2.2-5. CRN Site 50-Mile Regional Land Cover Map

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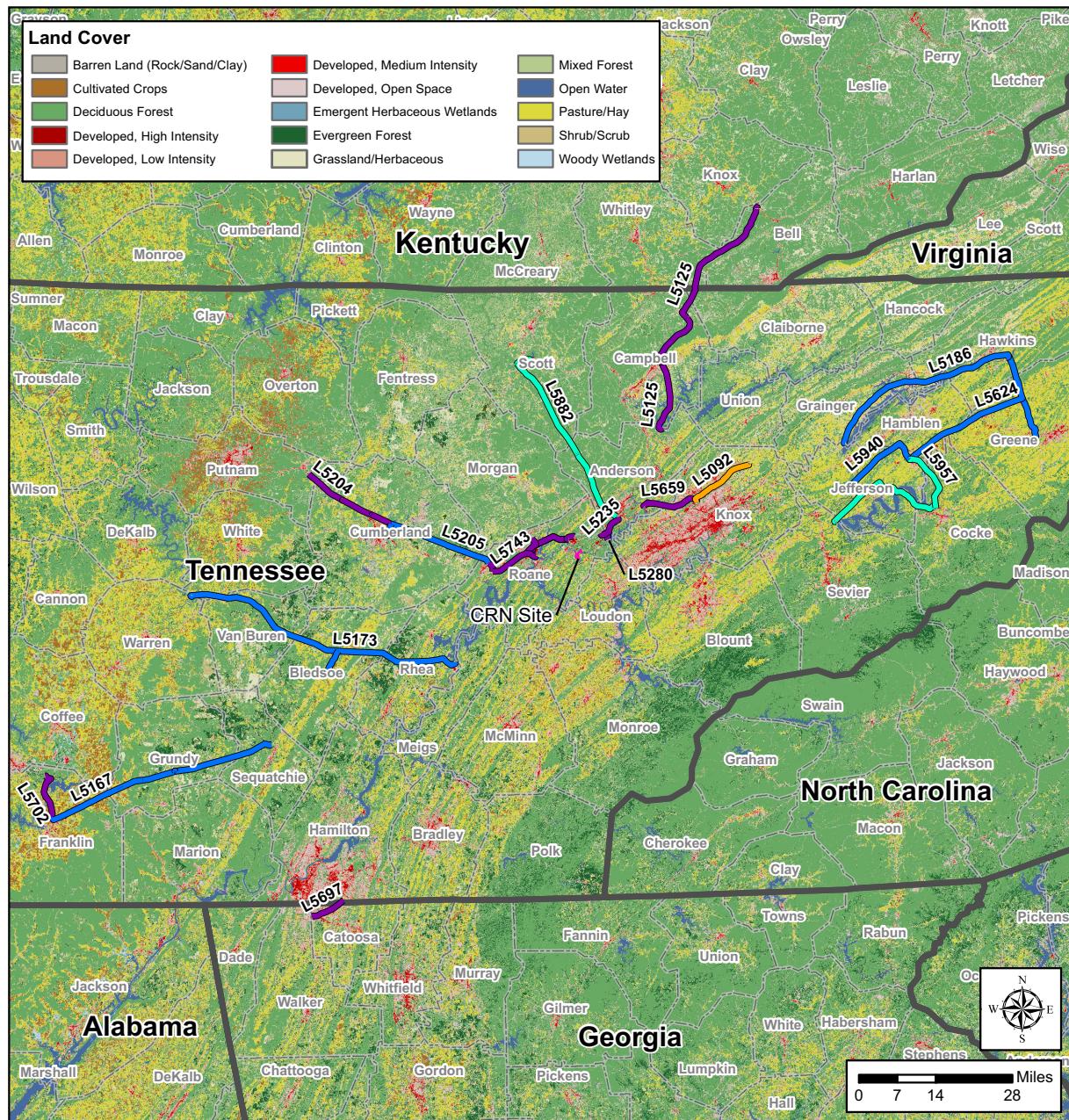


Legend

CRN Site	Bethel Valley Substation	Interstate	40' Contour Lines
ORR	Barge/Traffic Area	Highway	Major Road
Rivers and Lakes		Transmission Line	Local Roads

Figure 2.2-6. CRN Site Vicinity Transmission Lines

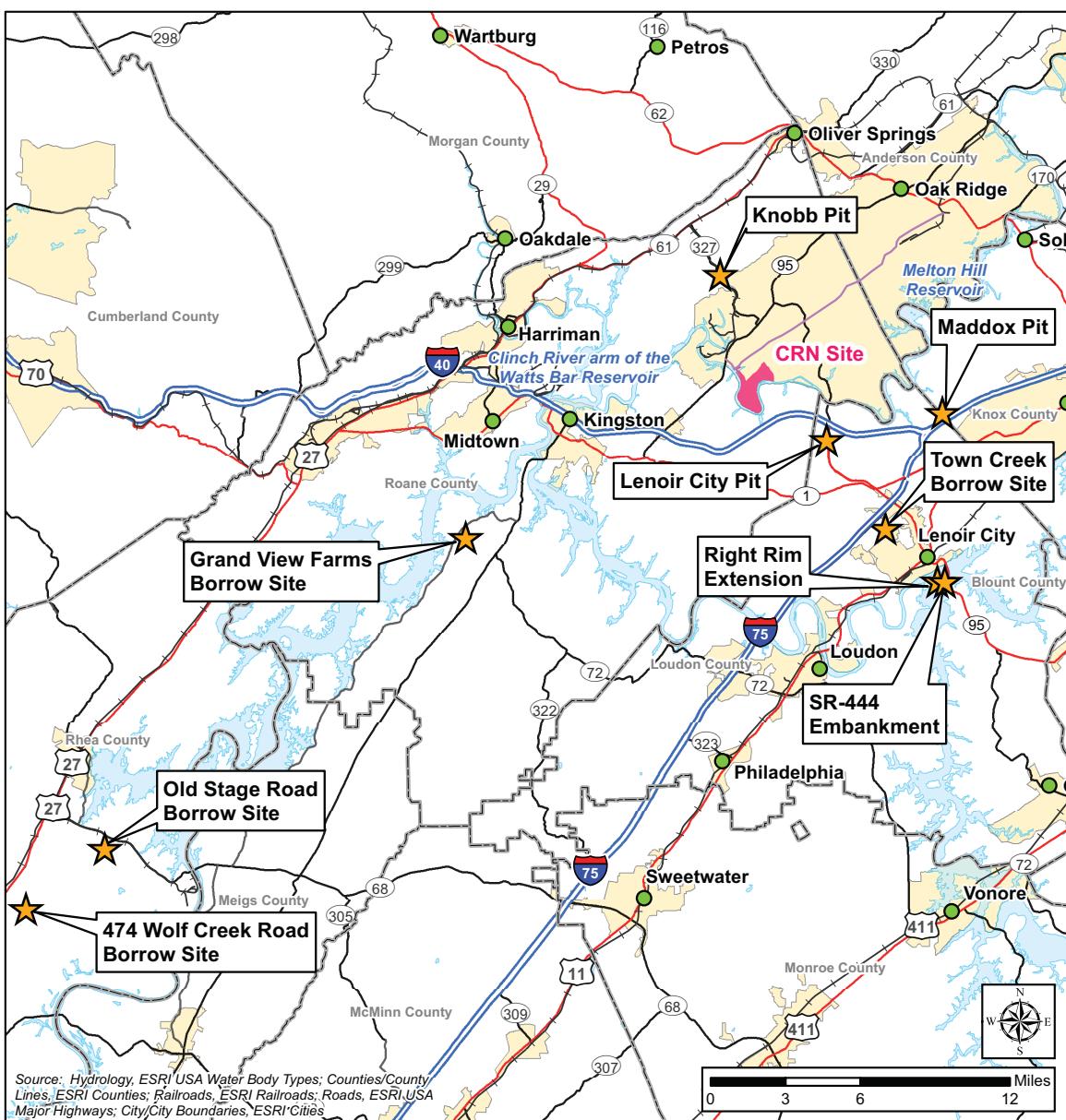
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Legend

- | | |
|-------------------------|------------------|
| Rebuild | CRN Site |
| Reconductor | Counties |
| Upgrade | State Boundaries |
| Upgrade and Reconductor | |

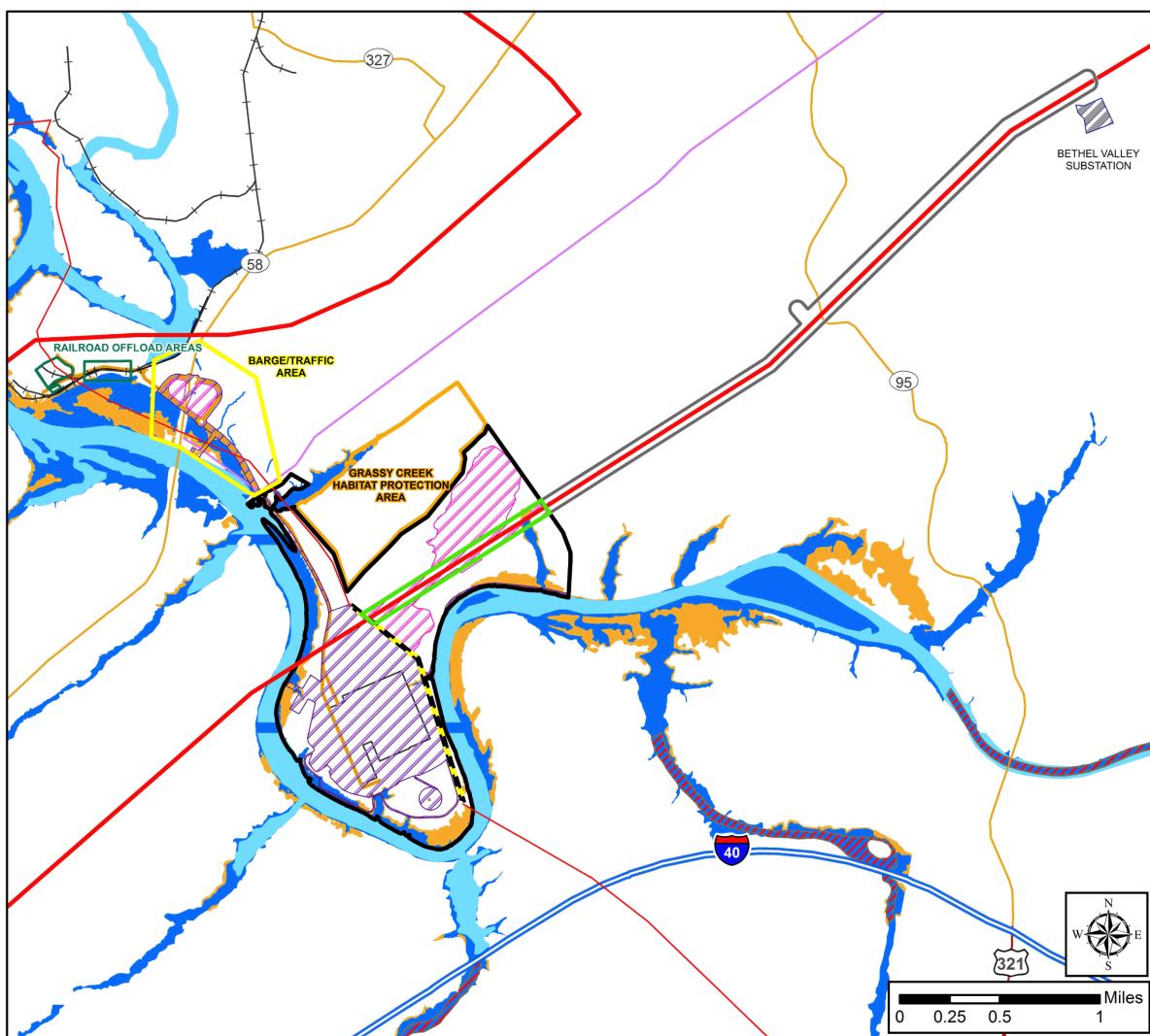
Figure 2.2-7. Transmission Line Segments Requiring Upgrades



Legend

★	Borrow Sites	□	Counties	—	Highway
■	CRN Site	—	Railroad	—	Major Road
■	Rivers and Lakes	—	Interstate	—	Bear Creek Road
■	City/Town Boundaries				

Figure 2.2-8. CRN Site Borrow Areas



Legend

CRN Site 500 kV Transmission section for potential underground line	CRN Site	Railroad
Offsite 500 kV Transmission Line section for potential underground line	Bethel Valley Substation	Interstate
Barge/Traffic Area	Grassy Creek Habitat Protection Area	Highway
161 kV Transmission Line	Permanently Cleared Areas (358 Acres)	Major Road
500 kV Transmission Line	Temporary Cleared Areas (182 Acres)	Regulatory Floodway
Approximate Proposed 161 kV	Bear Creek Road	Stream or River
	Railroad Offload Areas	1% Annual Chance Flood Hazard
		0.2% Annual Chance Flood Hazard

Source: Reference 2.2-30
Reference 2.2-31

Figure 2.2-9. CRN Site Flood Hazard Map

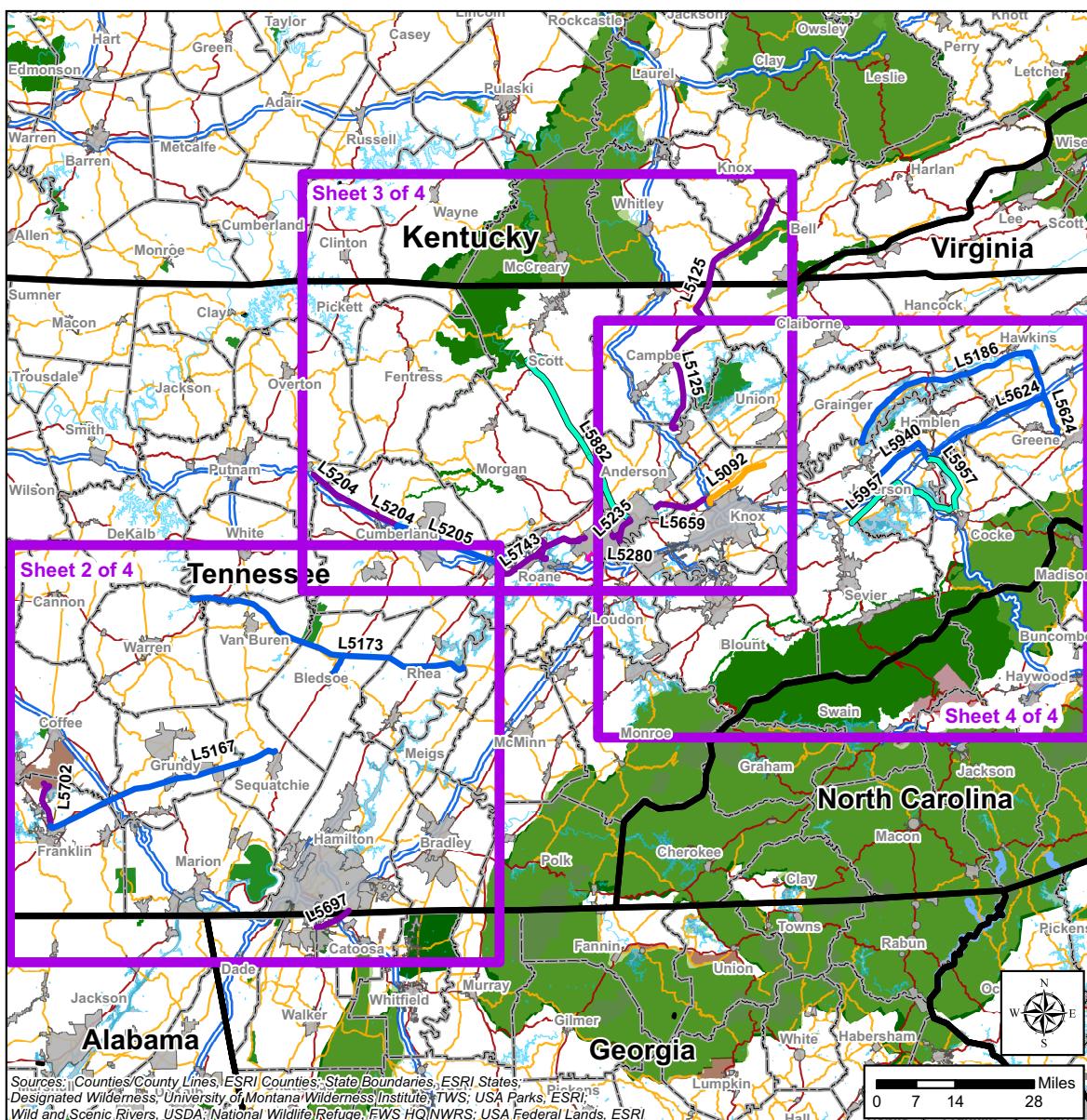


Figure 2.2-10. (Sheet 1 of 4) Transmission Segments Requiring Upgrades with Federal Lands, Parks, Wildlife Refuges and Wilderness Areas

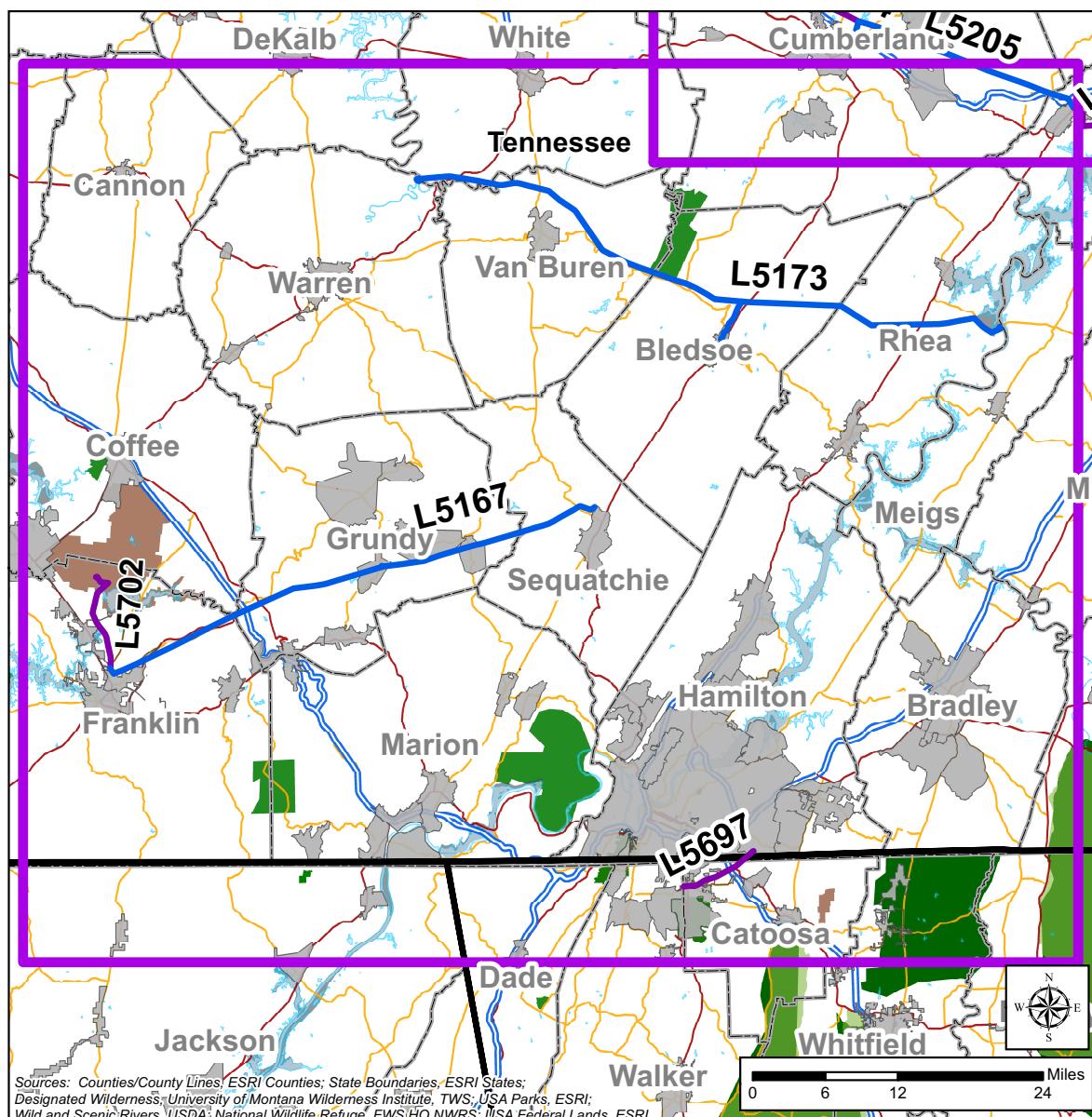


Figure 2.2-10. (Sheet 2 of 4) Transmission Segments Requiring Upgrades with Federal Lands, Parks, Wildlife Refuges and Wilderness Areas

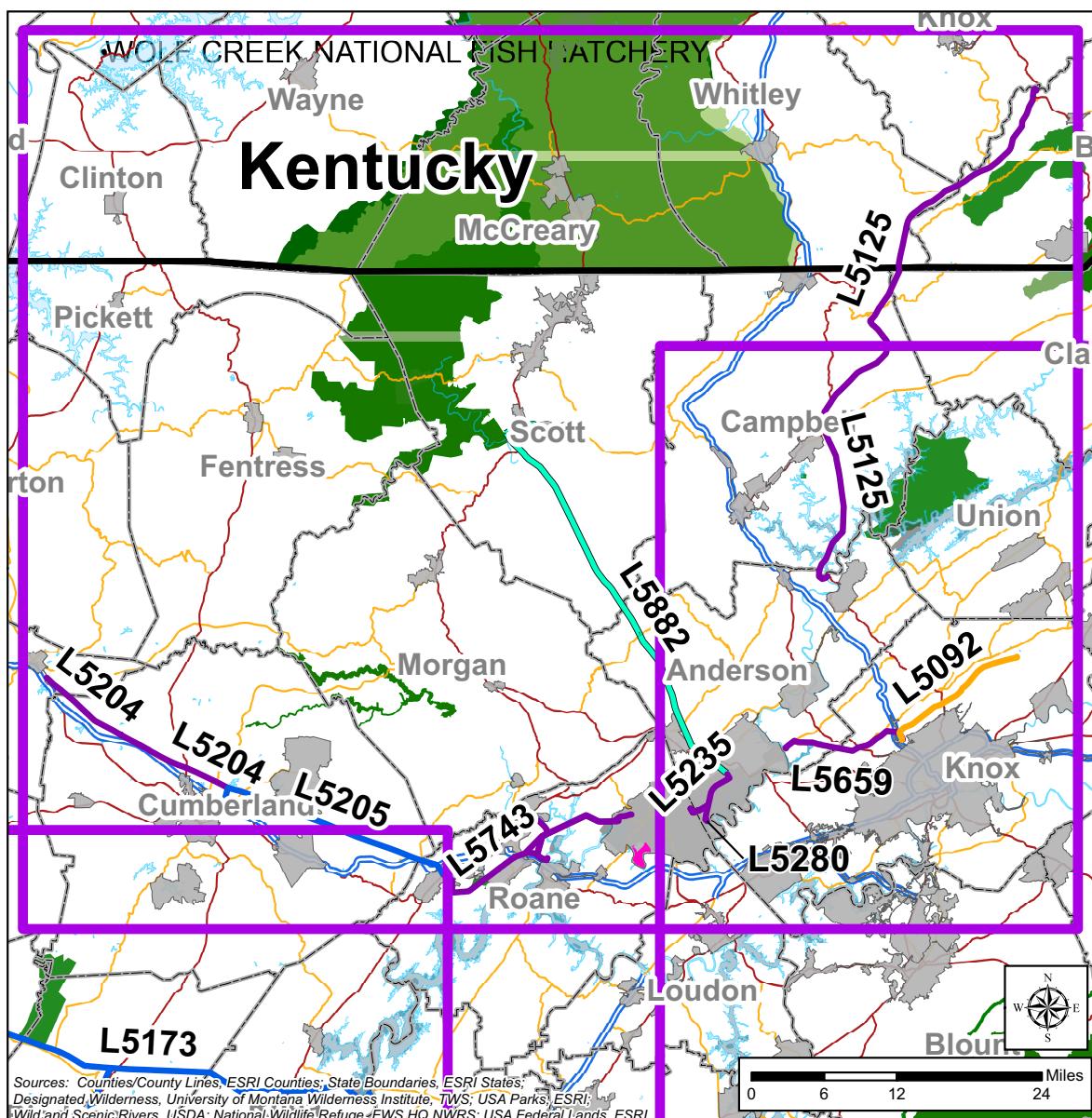


Figure 2.2-10. (Sheet 3 of 4) Transmission Segments Requiring Upgrades with Federal Lands, Parks, Wildlife Refuges and Wilderness Areas

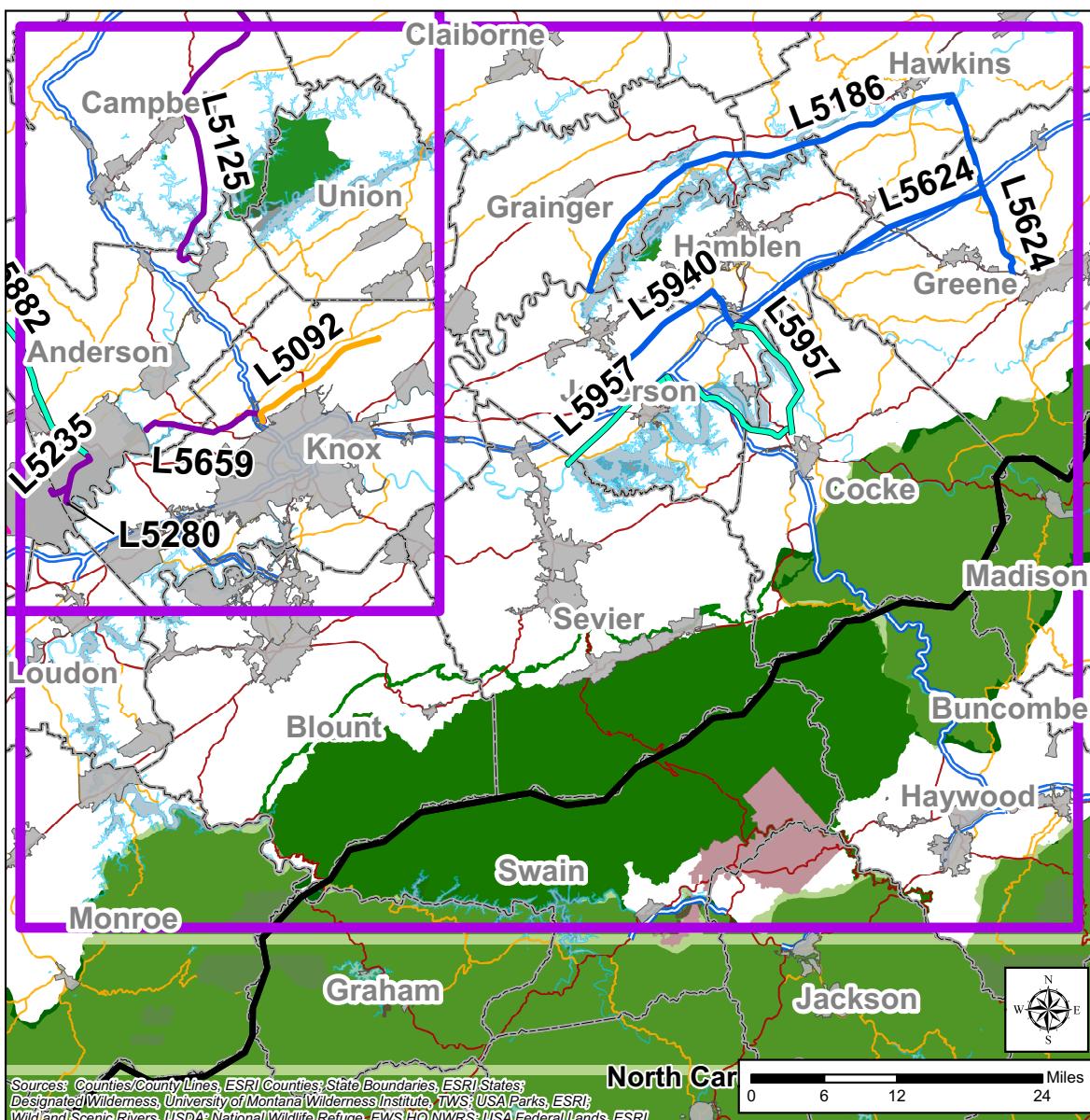


Figure 2.2-10. (Sheet 4 of 4) Transmission Segments Requiring Upgrades with Federal Lands, Parks, Wildlife Refuges and Wilderness Areas