Appendix L

Transmission Corridor Study

Western Greenbrier Co-Generation LLC

Electrical Transmission Line

Cultural and Ecological Evaluations

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1.1 PROJECT SUMMARY

Western Greenbrier Co-Generation, LLC (WGC) is proposing to construct a 90 MWe power-generating plant (on net basis) demonstrating an advanced atmospheric pressure fluidized-bed boiler developed by ALSTOM Power based on a compact inverted cyclone configuration. The power island will operate in tandem with a calciner to create a cementitious ash product. The organizational structure for WGC is a joint development entity formed as a limited liability company owned by three small municipalities (Rainelle, Rupert, and Quinwood).

Rainelle, West Virginia, has been selected as the site for the proposed demonstration project in a location adjacent to a planned new eco-park. The initial waste coal fuel source is located at Anjean, 18 miles by truck from the co-production facility. Anjean is a 400-acre abandoned coal mining area with approximately 4 million tons of coal waste concentrated in a 40-acre "black mountain." There are multiple other available coal waste sites within a similar distance from Rainelle assuring an ample supply of fuel for the operational life of the proposed power plant.

1.2 STUDY SCOPE

The proposed facility would be constructed and operated by WGC, with U.S. Department of Energy (DOE) providing financial support through a cooperative agreement with WGC under the DOE Clean Coal Power Initiative (CCPI) Program. The DOE is preparing an Environmental Impact Statement (EIS) for the Western Greenbrier Co-Production Demonstration Project. As part of the EIS, cultural resource and ecological studies were conducted of the project area including the initial transmission corridors and fuel supply locations. The project had proposed an original electrical transmission route approximately 8.5 miles long paralleling an existing American Electric Power (AEP) right-of-way from near a golf course south of Route 60 in Rainelle northeasterly to the McClung substation near Quinwood, WV. As a result of additional analysis, WGC is proposing an "alternate" transmission corridor route (Alternate Route). The Alternate Route would follow the same AEP line from the golf course at Route 60 to a point

approximately 3,000 feet north of the Meadow River and then proceed directly north to the Grassy Falls substation near Nettie, WV.

As part of its analysis of the Alternate Route, WGC has contracted with URS Corporation ("URS") to conduct initial cultural resource and ecological evaluations of the section of the proposed "Alternate" electrical transmission corridor not part of the initial EIS studies (i.e. north of Meadow River to Grassy Falls - see Figure 1). At this point, the Alternate Route has not been surveyed and therefore global positioning system (GPS) points provided by WGC were utilized to identify the route and study corridor. The intent and scope of this initial evaluation work was to identify potential significant/sensitive resources located within the proposed corridor. Section 2 of the report addresses the cultural resource evaluation for the Alternate Route and Section 3 presents the results of the ecological study (wetlands and threatened and endangered species) Alternate Route.

Prior to commencement of fieldwork, WGC provided URS with a Microsoft Excel spreadsheet containing geographic coordinates for the Alternate Route. URS converted the Excel spreadsheet into a database format (*.dbf) to plot the points on United States Geographic Survey (USGS) topographic maps and aerial photography using ESRI ArcMAP software to construct a Geographic Information System (GIS). Each point was given a unique identification number beginning with "PR" and a numeric value beginning with "PR1" and ending at "PR154" signifying "Proposed Right-of-Way." USGS topographic maps, aerial photography and other background GIS data were obtained from http://gis.wvdep.org and http://www.wvgis.wvu.edu. The PR points were imported into a handheld GPS unit to assist in field orienteering. All GPS points were used to develop the GIS to identify the possible archaeological and environmental impacts discussed in this report.

2-1 CULTURAL RESOURCES INVESTIGATIONS

URS conducted a Pedestrian Reconnaissance of the proposed Alternate Route in Greenbrier and Nicholas Counties (Figure 1). The goal of the Pedestrian Reconnaissance was to identify any previously recorded and unrecorded cultural resources in or adjacent to the area of potential effect (APE) for the project, and assess whether the proposed project will have any effect on cultural resources. For this study, the APE for archaeological sites includes the 17-mile alignment and 150-foot corridor where the proposed construction of the Alternate Route will occur. The field survey was conducted between August 2 and 11, 2005.

2.2 BACKGROUND RESEARCH

As part of the investigations, URS conducted background research to collect information on previously recorded cultural resources within a 2-mile (3.2-kilometer) radius of the APE. This review was conducted to evaluate the potential of the project for containing unrecorded archaeological sites to and determine if any portion of the proposed project area had been subjected to previous cultural resource investigations.

Examination of the West Virginia Archaeological Site files for Corliss, Nettie, Quinwood, and Rainelle 7.5-Minute Quadrangles, indicated that no previously recorded archaeological sites are located in the proposed project area. The nearest recorded site includes 46NI12, located approximately 2 miles northwest of the proposed transmission corridor. Site 46NI12 is situated on a ridge saddle and consists of two prehistoric mounds that probably date to the Early Woodland period. Because this site has not been subject to evaluation, its National Register status remains undetermined. The proposed project will have no effect on this resource.

Review of National Register of Historic Places (NRHP) files and West Virginia Historic Resource Survey (WVHRS) forms indicated that no National Register sites or recorded historic structures are present in the project area. Review of the resources indicates a number of other structures within a one-mile radius of the project area. These consist primarily of late nineteenth through mid-twentieth century residential and commercial

structures located east of the project area in Hominy Falls and Leivasy. These historic resources will not be impacted by the proposed project.

Previous archaeological investigations in the proposed project area are limited to work conducted by John Milner Associates, Inc. (JMA) for the proposed Western Greenbrier Co-Production Plant in Rainelle, Greenbrier County (Stevens and Chadwick 2005). Surveys consisting of shovel testing, soil auguring, and backhoe trenching on alluvial and upland landforms associated with Sewell Creek and the Plum Creek tract (area south of the property fence line) produced a single flake fragment of gray chert. Additional shovel test excavations around the original positive find failed to produce any artifacts. The single flake is classified as an isolated find and does not qualify as an archaeological site. Based on these results, JMA concluded that the proposed plant site had no potential to contain significant cultural resources and that construction should proceed as planned.

Other studies in the project vicinity consist of abandoned mine-land reclamation projects and smokeless coal mine and surface mine permit applications. Because most of these proposed undertakings involved areas occupied by steep gradients or areas previously disturbed by mining or timbering activities, the West Virginia State Historic Preservation Office (WVSHPO) designated the activities as No Effect Projects, clearing the applicants from further Section 106 responsibilities. One such permit application (01-817-MULTI) for an Incidental Boundary Revision (IBR) project involved areas located within the proposed project corridor. Previous disturbances related to timbering operations have impacted the area; as a result, the WVSHPO cleared the project.

2.3 PREHISTORIC ARCHAEOLOGICAL SENSITIVITY

URS calculated the archaeological sensitivity and the potential of the project area for unrecorded prehistoric sites by reviewing the findings of previous cultural resource investigations in the project vicinity by considering locational data on previously-recorded sites. As noted, one archaeological site has been recorded; though not determined, the site probably dates to the Early Woodland period. Additionally, the one

archaeological survey in the project vicinity failed to document any archaeological sites, suggesting that prehistoric settlement was sparse in the upper reach of the Meadow River drainage. While this review suggests a limited potential for prehistoric archaeological sites in the proposed project vicinity, unrecorded sites could be found in upland settings.

For upland settings in the proposed project area, unrecorded prehistoric sites are most likely to occur on ridgetops, benches, and saddles, as well as in stream valley bottoms that have not been disturbed by prior mining, timbering, or construction activities. These areas are considered to have a moderate potential for containing unrecorded prehistoric sites. All other project settings that run along steep slopes with gradients well in excess of 15 percent; these areas are concluded to have little or no potential for prehistoric archaeological sites.

2.4 HISTORIC ARCHAEOLOGICAL SENSITIVITY

The potential for the project area to contain unrecorded historic archaeological sites was evaluated primarily on the basis of historic structures on file at the WVSHPO and review of historic maps; given the project's isolated rural setting, however historic map coverage is limited. The project area is illustrated on a map for Greenbrier County (Harrison and Handley 1887) and on an economic geology map for Greenbrier County (Price and Heck 1937). Neither map indicates any historic settlement in the project area.

Data on recorded historic structures in the project vicinity indicate that most historic resources in the region relate to historic lumber camps and small late nineteenth- to early twentieth-century settlements east of the project alignment along Hominy Creek and to the south along Meadow River. Based on this review, there is no evidence of historic occupation in or adjacent to the proposed project area. Past historic land-use was probably limited to timbering and mining of the area. Consequently, historic archaeological potential in the project area is estimated to be low.

2.5 FIELD SURVEY

The field survey had two goals: (1) to document the existing condition of the project area; and (2) to evaluate the likelihood of encountering buried prehistoric and historic archaeological resources. Ground conditions in the APE were examined and limited soil auguring was conducted during initial walkover of the project area. The southwest-northeast-tending proposed transmission alignment traverses several ridge spurs and side slopes, crosses six named streams (Meadow Creek, Burdette Creek, Angline Creek, Kern Branch, Roaring Creek, and Hominy Creek), of the total 32 streams identified and then runs up slope and along a sinuous ridge north of Hominy Creek.

Walkover revealed that most (95 percent) of the project alignment is highly disturbed by previous timbering and mining activities; ongoing subsurface mining activities were noted east of PR 47 along Burdette Creek. Additionally, two overhead transmission lines cross the proposed alignment; one, located in the south, extends east-west across the alignment between PR 38 and 39. The second utility corridor begins at the alignment's northern terminus (PR154) and extends southwest immediately adjacent to the proposed alignment before it shifts to the east slightly at PR 141. From here, the existing transmission line continues in a southwesterly direction to PR 128, at which point it runs due south away from the proposed project alignment. Surface disturbances over most of the proposed alignment were indicated by large clear-cut areas subject to surface mining and overhead utility line installation, evidenced by irregular topography, exposed soils and bedrock. Vegetation over these areas consists of invasive secondary scrub plants, including tall grasses, saplings, and briers. Portions of the northern and southern most sections (PR 1-15 and PR 139-154) were originally thought to be prehistorically sensitive, although reconnaissance revealed surface disturbances attributed to timbering operations. Disturbances in these areas were indicated by irregular topography, old road cuts, deflated soils, and immature forests suggestive of grading activities. Large clear-cut areas that lacked vegetation indicated more recently disturbed timbering areas. Due to disturbances and steep gradients documented during the pedestrian reconnaissance, 95 percent of the proposed alignment is concluded to have limited to no potential for archaeological remains.

Despite the large amount of surface disturbances documented during the walkover, seven areas (five percent) still retain some potential for unrecorded archaeological sites. Of these, four include stream crossings (see below). The other three segments traverse ridge spurs (PR 1-2 and PR 12-13) and a ridge saddle (PR 83-84). Regarding the ridge spurs near the southern project terminus, although recent timbering activities documented above may have disturbed these landforms, the level wooded areas where the proposed alignment crosses may still retain some potential for unrecorded prehistoric archaeological sites.

Reconnaissance between PR 83 and 84 confirmed that the ridge saddle setting was sensitive for prehistoric archaeological sites (Figures 5 and 12). This setting is similar to the one documented for previously recorded site 46NI12. Disturbances in the vicinity of PR 83 and 84 are limited to minimal clearing for small residential construction, an adjacent gravel road, and All Terrain Vehicle (ATV) trails that traverse the ridge. Given the similar topographic settings for the area between PR 83 and 84 and Site 46NI12, as well as the lack of disturbances, the initial assessment of moderate prehistoric sensitivity for upland saddles remains unchanged.

As noted, the proposed alignment crosses six named streams. Except for Hominy and Roaring Branch Creeks, the remaining watercourses comprise the headwaters of first- and second-order tributaries consisting of shallow bedrock streams with limited to moderate flow. The floodplain along most of these streams comprises hummocky terrain with exposed bedrock and is occupied by secondary mixed deciduous and coniferous growth. Limited soil auguring at these locations revealed shallow soils of dark brown silts representing recent colluvium/alluvium. Steep slopes flank the floodplains of these streams. Based on these observations, URS concluded that portions of the proposed alignment that crossed Meadow Creek, Burdette Creek, Anglne Creek, Kern Branch, and the unnamed intermittent stream (between PR 122 and 123) have limited to no potential for archaeological sites.

Hominy Creek consists of a first-order tributary to the Gauley River, while Roaring Branch serves as a tributary to Hominy Creek. Pedestrian reconnaissance of areas where the proposed alignment crosses or runs adjacent to these creeks confirmed that three floodplain/lower terrace settings (PR 92-95, PR 98-99, and PR 132-134) and one ridge spur setting (PR 112-114) was sensitive for prehistoric archaeological sites (Figures 6 through 9 and 13 through 16). Walkover and limited soil auguring at these areas indicated that both creeks flow at depths ranging from approximately three to six feet. Observation of shoreline and soil augur profiles revealed intact, well-drained soils, suitable for small encampments where such activities as hunting or tool manufacturing/maintenance would have occurred. Based on these observations, the initial assessment of moderate sensitivity for prehistoric archaeological sites in stream valley bottoms aforementioned alignment segments remains unchanged. Most remaining bottom settings and upland areas overlooking Hominy Creek and Roaring Creek either encompass steep slopes or have been severely disturbed by activities mentioned above.

Based on this review, URS recommends that a subsurface archaeological survey (Phase I) be conducted in areas where project impact zones for transmission alignment intersect settings of moderate potential. These include the following seven areas (PR 1-2, PR 12-13, PR 83-84, PR 92-95, PR 98-99, PR 112-114, and PR132-134).

3.1 ECOLOGICAL INVESTIGATIONS

URS conducted an ecological evaluation of the proposed Alternate Route in Greenbrier and Nicholas Counties (Figure 1). This evaluation included (1) identification of potential types and locations of wetlands, (2) number and type of riparian stream crossings and (3) suitability of habitat for threatened and endangered species. The field survey was conducted between August 1 and 11, 2005.

3.2 THREATENED AND ENDANGERED SPECIES

As identified, there has been previous studies and documentation prepared in support of development of the EIS for this project. As part of the previous studies a request was made to the United States Fish and Wildlife Services (USFWS) for information concerning any potential impacts within a 30-mile radius of the power plant site. This radius would include the area impacted by the proposed Alternate Route. Appendix A contains the July 8, 2004 response from the USFWS identifying three mammals (2 bats and 1 squirrel), two plants and three mussels that maybe be present in this 30-mile radius. On July 26, 2005, URS contacted Monte Mathews of the Elkins, West Virginia USFWS office and provided him with a map of the Alternate Route and requested an update concerning any species of concern specific to this location. Mr. Mathews identified that there were no additional species of concern outside those listed in their July 8, 2004 letter. Mathews said that although the letter lists species that may occur within the general area, there was no confirmed documentation of any of the species along the Alternate Route. He also indicated that there are no know hibernaculum caves along the corridor. The species of concern would be the Indiana bat since it may be in the general area and its habitat (hollow trees or loose bark) is pervasive in any forested area.

Also in support of the EIS, the project requested the same information from the West Virginia Division of Natural Resources (WVDNR). An additional letter was received from the WVDNR on May 25, 2004. The letter is also included in Appendix A, and lists all of the same federal species as does the USFWS, in addition to the Shale barren rockcress (*Arabis serotina*).

3.2.1 Regional Species Occurrence

Based on consultation with the USFWS and the 2004 letter from the WVDNR the following are species that could occur within the project study area.

Indiana bat - *Myotis sodalis*
The Indiana myotis is a rather nondescript small brown bat with a wingspan of approximately 9.5-10.5 inches. This bat is very similar in appearance to the common little brown myotis (a bat often found in houses), but can be distinguished by the duller luster of its fur and toe hairs that do not extend beyond the tips of the claws. The Indiana myotis also has a more pinkish colored nose. The calcar (the cartilage which extends from the ankle to support the tail membrane) of the Indiana myotis usually has a keel, but this is often difficult to see. During hibernation Indiana myotis congregate in more densely packed clusters than other bats in its range.
Habitat: The Indiana bat is a "tree bat" in summer and a "cave bat" in winter. There are four ecologically distinct components of the annual life cycle: winter hibernation, spring staging and autumn swarming, spring and autumn migration, and the summer season of reproduction. Caves are important for the Indiana myotis. During the winter, large numbers of Indiana myotis gather in a few caves that provide suitable conditions for hibernation. During the summer, females form small colonies under the loose bark of trees. Here they raise their young. Males also appear to form small colonies in trees, either in hollow trees or under loose bark. Feeding areas for the Indiana myotis consist of wooded habitats. Early studies indicated that wooded areas along rivers were the preferred feeding areas, but more recent studies suggest that upland forests are also used.
Range: The Federally-endangered Indiana bat is known from the region that includes central West Virginia and western Virginia, and has been reported in Greenbrier County. Winter hibernacula occur along the eastern and southern border of Virginia, including Greenbrier, Hardy, Mercer, Monroe, Pendleton, Pocahontas, Preston, Randolph, and Tucker counties. In western Virginia, winter hibernacula have been reported from Bath, Bland, Craig, Giles, Dickenson, Highland, Lee, Montgomery, Tazewell, and Wise counties. Summer records for the area consist primarily of adult males, with sites in Clay and Nicholas counties, West Virginia. The U.S. Fish and Wildlife Service Recovery Plan (1999) provides a description of the life history.

Virginia Big-eared Bat - *Corynorhinus townsendii virginianus*
Description: The Virginia big-eared bat is a medium-sized bat, about 3.5 - 4 inches long. Characteristic features are the large ears (more than one inch long) and the presence of two large lumps (glands) on the muzzle. Virginia big-eared bats can be distinguished from Rafinesque's big-eared bats, by fur color and toe hairs. Virginia big-eared bats are pale to dark brown on the back and light brown underneath.
Habitat: Virginia big-eared bats prefer caves in karst regions (areas underlain with limestone bedrock and many caves and sinkholes) dominated by oak-hickory or beech-maple-hemlock forest. These bats usually hibernate in tight clusters near entrances of caves that are well-ventilated and where temperatures range from 32 to 54 degrees F. In summer, maternity colonies are found in the relatively warm parts of caves.

Range: The Federally-endangered Virginia big-eared bat is the subspecies of Townsend's big-eared bat that occurs in Kentucky, North Carolina, Virginia, and West Virginia. Caves used by the species are concentrated in the northeastern portion of the state: Grant, Tucker, Pendleton, Hardy, Preston, and Randolph counties. The largest single colony is approximately 90 miles to the northeast in Pendleton County. In Virginia, two active Virginia big-eared bat maternity colonies are currently known; both are over 60 miles away from the project area in Tazewell County.

Virginia Northern Flying Squirrel – *Glaucomys sabrinus fuscus*

Description: This species is a small nocturnal mammal, with a browner dorsal pelage, distinguished by the belly hairs being slate-colored at the bases, the coat is dense, soft and the sides grayish-brown, sometimes washed with cinnamon. The tail is broad, horizontally flattened, and there are membranes (patagia) between the fore and hind legs. The eyes are prominent, large and blackish. The total length is 11-12 in. (290 mm), and weight 4-6.5 ounces. This species usually lives in small family groups in nests in tree holes, and old bird nests. They are nocturnal, usually active even in the severest winter weather. The voice is high-pitched insect-like chirps.

Habitat: This subspecies is typically found in conifer-hardwood ecotones or mosaics consisting of mature beech, yellow birch, sugar maple, hemlock, and black cherry associated with red spruce and balsam or Fraser fir. This species often lives near streams and rivers.

Range: The Federally-endangered Virginia northern flying squirrel (*G. s. fuscus*) is known only from the Appalachian Mountains in West Virginia and Virginia. In West Virginia, it has been captured in Greenbrier, Pendleton, Pocahontas, Randolph, Tucker, and Webster counties (USFWS 1990). The closest known population is in Cranberry Wildlife Management Area on Monongahela National Forest, about 15 miles northwest of the project areas. This species is closely associated with higher elevations (>3,280 ft) and coniferous forests of spruce and fir (USFWS 1990).

Virginia Spiraea - *Spiraea virginiana*

Description: Virginia Spiraea bears cream-colored flowers on branched and flat-topped axes. This shrubby plant grows from 2 to 10 feet (0.6 to 3 meters) tall and has arching, upright stems. Its alternate leaves are of different sizes and shapes extremely variable; the usual length is 2-4 inches and elliptic in outline. The flowers, found in June and July, are white and occur in groups at the end of leafy branches. Spiraea spreads clonally and forms dense clumps that spread in rock crevices and around boulders.

Habitat: Virginia Spiraea is unique because it occurs along rocky, flood-scoured riverbanks in gorges or canyons. Although it is an unusual requirement, flood scouring is essential to this plant's survival because it eliminates taller woody competitors and creates riverwash deposits and early sucessional habitats. These conditions are apparently essential for this plant's colonization of new sites (Rawinski 1988). Spiraea is found in thickets. Common woody vine associates include fox grape; summer grape; riverbank grape; winter grape; graybark or pigeon grape; possum grape; sand grape; and muscadine, scuppernong. Other plant associates include royal fern, yellow ironweed or wing-stem; ninebark; smooth alder or brookside alder; silky cornel or kinnikinnik; and shrubby yellowroot (Parkin, U.S. Fish and Wildlife, Personal Communication, 1990). The bedrock surrounding Spiraea habitat is primarily sandstone and soils are acidic and moist. Spiraea grows best in full sun, but it can tolerate some shade (Technical Bulletin 1990). One population in West Virginia inhabits a disturbed wetland habitat near a road (Rawinski 1988).

Range: West Virginia has the largest population with 5,700 plants (Rawinski 1988). West Virginia's populations are found on the Bluestone River in Mercer County; the Buchannon River

in Upshur County; in a shrub-dominated, wet meadow in Raleigh County; and along the Gauley and Meadow Rivers in Nicholas and Fayette Counties.

Running buffalo clover - *Trifolium stoloniferum*
Description: Running buffalo clover is a glabrous perennial that forms long basal runners that root at the nodes. The plant's erect, flowering stems, typically 3 to 6 inches tall, with two leaves near the summit, their stipules with ovate-oblong blades, their obovate leaflets 2.5-4.5cm long; leaves of the runners with lancolate stipules and mostly smaller leaflets; peduncles short, from the upper axils; heads subglobose, 2.5-3.5 cm in diameter; calyx teeth twice as long as the glabrous tube; corolla white, tinged with purple, exceeding calyx. Flowering occurs from mid-April to June.
Habitat: In West Virginia, running buffalo clover is present on jeep trails, old logging roads, skid rows, and wooded thickets. The plant has been identified at approximately 35 sites in West Virginia in Barbour, Brooke, Fayette, Pendleton, Pocahontas, Randolph and Tucker Counties.

Small-whorled pogonia - *Isotria medeoloides*
Description: Small-whorled pogonia is a perennial herb with pubescent roots that grows up to 9.5 to 25 centimeters in height (USFWS 1996). A whorl of 5 or 6 leaves light green (USFWS 1996) to grayish-green are produced near the top of the stem and are usually 4 to 8 cm in length. The presence of the leaves beneath the flower(s) gives the plant its common name. The greenish-yellow flowers are solitary (or occasionally paired) and arise from the center of the leaf whorl. Flowering occurs from about mid-May to mid-June, with the flowers apparently lasting only a few days to a week or so and the species doesn't necessarily flower annually (USFWS 1996).
Habitat: Small-whorled pogonia generally inhabits open, dry, deciduous woods with acid soil. It occurs in habitat where there is relatively high shrub coverage or high sapling density (USFWS, 1996).
Range: Small-whorled pogonia is a widespread, but very local species in northeastern North America from southern Maine and Michigan, south to central and western West Virginia, western North Carolina, eastern Tennessee, and into northern Georgia. In West Virginia it has only been identified at two sites with one to two plants at each site.

Shale Barren Rockcress *Arabis serotina*
Description: A biennial plant, in that after a seed sprouts, leaves grow in a small circular cluster next to the ground during the first year. This group of leaves is called a rosette, and they remain alive through their first winter and into the second year when the plant may produce flowers near the end of summer. To produce flowers, a stem grows upward from the rosette to a height of about 2 feet and may have many branches. Small flowers and a few small leaves grow from these branches. New rosettes usually sprout from seeds although they may occasionally sprout from other rosettes.
Habitat/Range: The shale barrens, where this rockcress grows, have soil which contains many hard, small shale fragments. The hillsides typically face the south or the east, so they get very hot during summer days. Shale barrens occur on Devonian-aged shale exclusively in the Valley and Ridge Geographic Province of the Allegheny Mountains. Only a few types of plants can survive on shale barrens. These plants include pines, oaks, and junipers along with a sparsity of non-woody plant species. It has been found in only Greenbrier, Pendleton, and Hardy Counties, West Virginia.

Fanshell - *Cyprogenia stegaria*
Description: Shell rounded, solid, and moderately inflated. Anterior margin rounded, posterior margin bluntly rounded or truncated. Ventral margin broadly rounded. Umbos not elevated above the hinge line. Beak sculpture, if visible, of a few weak ridges. Growth lines appear as distinct elevated ridges. Numerous pustules usually concentrated in the center but occasionally covering the entire surface of the shell. Periostracum usually greenish yellow, with a pattern of dark green rays made up of numerous smaller broken lines or dots. Length to 3 inches (7.6 cm). Pseudocardinal teeth relatively large and serrated; two in the left valve, one in the right. Lateral teeth roughened, straight to slightly curved, heavy and very short. Interdentum wide. Beak cavity shallow to moderately deep. Nacre white, iridescent posteriorly.
Habitat/Range: Ohio River basin from Illinois across to Alabama, Virginia, West Virginia and Pennsylvania in medium to large rivers in gravel riffles.In West Virginia it has been identified in the Kanawha River in Fayette and Kanawha Counties.

Northern Riffleshell - *Epioblasma torulosa rangiana*
Description: This subspecies is a small to medium-sized, sexually dimorphic freshwater mussel. Shell lengths of adults range from 4.5 - 7.6 cm. The shell is brownish yellow to yellowish green with diffuse, fine green rays. The very broadly rounded expansion of the shell of adult females enables one to differentiate between the sexes.
Habitat/Range: The mussel lives mainly in highly oxygenated riffle areas of rivers or streams of various sizes. Preferred substrates range from rocky, sandy bottoms, to firmly packed sand and fine to coarse gravel. Only two specimens have been reported in West Virginia in the Elk River in Kanawha County.

Pink Mucket - *Lampsilis abrupta*
Description: Shell round to elliptical, solid, and inflated. Anterior end rounded, posterior end bluntly pointed in males, truncated in females. Dorsal margin straight, ventral margin straight to slightly curved. Umbos turned forward and elevated above the hinge line. Beak sculpture, if visible, of three or four double-looped ridges. Shell smooth, yellow or yellowish green and rayless or with faint green rays. Length to 4 inches. Pseudocardinal teeth triangular, thick, divergent; two in the left valve, one in the right, occasionally with a smaller tubercular tooth in front. Lateral teeth short, heavy, and relatively thick. Beak cavity deep. Nacre pink or white, iridescent posteriorly.
Habitat/Range: The lower Mississippi and Ohio rivers and their larger tributaries in gravel or sand. In West Virginia it has been identified in the Ohio River in Cabell, Mason and Wood counties, Kanawha River in Fayette County and Elk River in Kanawha County.

3.2.2 Results of Field Reconnaissance

As a result of the fieldwork activities no threatened or endangered mammal species were identified. Based on a review of the aerial maps and field reconnaissance, it is estimated that approximately 50 % of the corridor is forested land. Therefore, due to the habitat present and range for the Indiana Bat (*Myotis sodalis*), it is not impossible for the Indiana Bat to be present at various locations along the proposed route.

Habitat for the Virginia Big-eared Bat (*Corynorhinus townsendii virginianus*) and the Virginia Northern Flying Squirrel (*Glaucomys sabrinus fuscus)* appeared to be limited as a result of the fieldwork activities. The Virginia Big-eared Bat prefers caves in the karst regions while the Virginia Northern Flying Squirrel prefers spruce and fir forests. Neither of these habitat types was encountered during fieldwork activities.

No threatened or endangered plant species were encountered as a result of fieldwork activities. Virginia Spirea (*Spirea virginiana*) habitat includes rivers and gorges. There are no large riverine systems within the project area, therefore the possibility of encountering this species is unlikely. Shale barren rockcress habitat is limited to shale barrens. There were no shale barrens encountered during fieldwork activities, therefore the possibilities of the presence of this species is also unlikely.

Habitat for the Running Buffalo Clover (*Trifolium stoloniferum*) and the Small Whirled Pagonia (*Isotria medeoloides*) prefer open woodlands. Due to historical coal mining and logging operations throughout various portion of the proposed corridor, suitable habitat was considered limited and no species were noted.

Habitat for the Northern Riffle Shell (*Epioblasma torulosa rangiana*), Fanshell (*Cyprogenia stegaria*), and the Pink Mucket (*Lampsilis abrupta*) is not present within the proposed corridor. These mussel species prefer medium to large rivers with gravel and sand and have been identified in the Kanawha River in Fayette County and the Elk River in Kanawha County.

3.3 WETLAND AND STREAM EVALUATIONS

On August 1 through August 11, 2005 an evaluation was conducted to estimate the potential wetlands and streams that occur within the proposed electric transmission corridor for the WGC project.

Wetlands were delineated using the Modified Routine On-site Determination Method, as described in the *1987 Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1). All wetlands within the study corridor were classified according to the U.S. Fish and Wildlife Service's (USFWS) *Classification of Wetlands and Deepwater Habitats for the United States* (Cowardin et. al., 1979). Wetland classification found in the project corridor included: palustrine emergent (PEM), palustrine scrub/shrub (PSS), palustrine open water (POW), palustrine forested (PFO) and a combination of above.

The study area soils were examined with a drain spade shovel. Soils were classified according to the criteria outlined in the 1987 Federal Manual through the use of a *Munsell Soil Color Chart* (Kollmorgen, 1975). In addition to the direct observation of soil saturation and inundation, hydrologic indicators such as buttressed root systems, wetland drainage patterns, leaf litter staining, etc. were also used to determine the presence of wetland hydrology within the study area.

National Wetland Inventory (NWI) Mapping (1996) for the study area was reviewed to identify potential wetlands prior to entering the field. Once field activities commenced, any NWI wetlands identified located within the study corridor were thoroughly investigated in the field to determine if these areas were regulated wetlands. Additional wetlands not shown on the NWI map were identified based on observations made during the field investigation.

Once the field team determined that a potential system was a wetland, the wetland was identified and flagged using survey flagging. GPS equipment was then used to locate the wetland boundaries if possible. Color photos were taken at each wetland.

Information collected during the field investigation included dominant vegetation, soil characteristics, hydrology source and any other pertinent notes regarding the wetland.

Coal mining and timbering operations were the most significant type of disturbance within the project study corridor. Other disturbances noted during the field investigations

included mowing and electrical line right-of-ways. Wetlands were considered to exist in a disturbed condition if one or more of the three wetland criteria (hydrophytic vegetation, hydric soils and hydrology) exhibited strong unnatural characteristics.

Figures 17 through 34 identify the location of the streams and potential wetland areas.

3.3.1 Wetlands – Results

The NWI mapping identified two wetland systems within the project study corridor. One wetland was identified as a palustrine, unconsolidated bottom, permanently flooded, diked/impounded wetland (PUBHh) located near PR 40. The other NWI wetland, located near PR 97, was designated as palustrine, unconsolidated bottom, permanently flooded, artificial substrate, excavated wetland (PUBHrx).

Soil colors, vegetation and hydrologic indicators indicate that wetlands are present within the study corridor. During the field investigation, a total of 14 palustrine wetland systems were identified and delineated. A listing of wetland classifications, location and sizes is presented in Table 3-1.

Table 3-1. Wetland Summary Table

Wetland Name	Location	Classification	Size (acres)	Size (hectares)
W-01	PR14	PEM	0.01	0.01
W-02	PR26	PEM	0.09	0.04
W-03	PR28/PR29	PEM	0.01	>0.01
W-04	PR38	POW	0.12	0.05
W-05	PR38/PR39	POW/PEM	0.33	0.13
W-06	PR40	POW	0.23	0.09
W-07	PR47/PR48	PEM	0.09	0.04
W-08	PR97	POW/PEM	0.50	0.20
W-09	PR98/PR99	PEM/PSS	0.08	0.03
W-10	PR100	PEM	0.02	0.01
W-11	PR101	PEM/PFO	0.68	0.27
W-12	PR102	PEM	0.31	0.13
W-13	PR116/PR117	POW	0.27	0.11
W-14	PR151	PEM	0.05	0.02
Total Wetland Sizes			**2.79**	**1.13**

PEM – Palustrine Emergent
POW – Palustrine Open Water
PSS – Palustrine Scrub Shrub
PFO – Palustrine Forested

Wetlands – Descriptions

The hydrology of the wetlands is driven by several different sources. Groundwater, usually in combination with overland flow, is the primary source of hydrology for a majority of the wetlands. Most of the wetlands also exhibit drainage patterns, soil saturation and standing water.

The majority of the soils taken within the wetlands are silt loam or clay loam in texture. Rock fragments were present throughout many of the wetland soils that were identified and delineated. Typical wetland soils for this project have a hue of 10 YR, value of 3 and 6 and a chroma of 1 or 2 (*Munsell Soil Color Chart*). Activities such as coal mining and various timbering operations have influenced the soils in a number of areas within the project study corridor.

Several species of plants appear within each vegetative class. Typical PEM wetlands within the project corridor contain Sensitive Fern (*Onoclea sensibilis*), Soft Rush (*Juncus effuses*), Spotted Jewelweed (*Impatiens capensis*) and Grass sp. (*Graminaceae sp.*). Typical PSS vegetation contains Black Willow (*Salix nigra*) and saplings (less than 3 in. diameter at breast height [dbh]) of Slippery Elm (*Ulmus rubra*) and Silver Maple (*Acer saccharinum*). Typical components of PFO contain trees (< 3 in. dbh) of the aforementioned species. Wetlands having more than one vegetative class are generally composed of a combination of the above species. No threatened or endangered plant species were identified at the time of the field investigations.

Wetlands – Summary

A total of 14 wetlands were identified and delineated within the project study area corridor. These wetlands comprise 2.79 acres (1.13 ha) of wetland habitat. The classification of the majority of the wetlands identified was PEM. There were seven PEM wetlands comprised a total of 0.58 acres (0.24 ha). Three wetlands determined to be POW wetlands totaled 0.62 acres (0.25 ha). Two POW/PEM wetlands were identified totaling 0.82 acres (0.33 ha). One PEM/PSS wetland was identified totaling 0.08 ac (0.03 ha) and one PEM/PFO wetland measured 0.68 acres (0.27 ha).

3.3.2 Streams – Results

Aquatic biota sampling was undertaken in perennial and intermittent streams in order to document macroinvertebrate occurrence. Qualitative macroinvertebrate samplng was conducted during fieldwork activities by overturning the rock substrate at several locations within the study corridor. Macroinvertebrates were then identified in the field. Generally, mayflies (*Ephemeroptera*), stoneflies (*Plecoptera*) and caddisflies (*Trichoptera*), are generally considered pollution sensitive taxa, and therefore are abundant in streams with good water quality.

A total of 32 streams (perennial and intermittent) were identified in the project study corridor. Sample points for each stream were established at the crossing within the corridor. The stream was then surveyed for the width of the study corridor. Table 3-2 provides results from the field investigations.

There were 24 perennial streams identified within the project study corridor. Meadow Creek, Burdette Creek, Hominy Creek and its unnamed tributary were identified as a result of the fieldwork activities. These four streams were the largest of the streams encountered, with average widths of 20 to 30 ft and depths of an average of 3 ft. Substrate present within all of the perennial streams include bedrock, boulders, rubble, cobble. Macroinvertebrates that were evident in most of the perennial streams include *Trichoptera*, and *Plecoptera*, which are all indicators of good water quality. *Chrironomidae*, was also noted, however this species is not indicative of water quality since it is tolerant of many pollution sources. Numerous species of fish were also located in several of the larger streams.

Seven of the streams identified were considered intermittent. These streams were of this classification because of the substrate present with an established bed and bank but no flowing water.

One of the streams, S-17 showed characteristics of both perennial and intermittent streams within the project study corridor.

The majority of the streams had stable, vegetated banks. Typical vegetation on the streambanks include Rhododendron (*Rhododendron sp.*), Mountain Laurel (*Kalmia latifolia*), birch (*Betula sp.*) and maple (*Acer sp.*) species.

Factors that may impact the streams within the study corridor include mining activities and timbering practices that are currently being conducted. Without the proper best management practices, the streams can be impacted from siltation entering the stream and lack of cover to cool the streams and provide food for macroinvertebrates.

Table 3-2. Stream Summary Table

Stream ID	Location	Type	Estimated Width	Estimated Depth	Notes
S-01	PR8/ PR9	Perennial	2 ft	6 in	Established bed and bank with flowing water; macroinvertebrates identified (*Trichoptera, Chironomidae*)
S-02	PR13/ PR14	Perennial	16 in	6 in	Established bed and bank with flowing water; macroinvertebrates identified (*Chironomidae*)
S-03	PR19/ PR20	Perennial	12 ft	12 in	Meadow Creek; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*); stream listed on the WVDNR for stocking
S-04	PR22	Intermittent	NA	NA	Pockets of water noted with no macroinvertebrates noted
S-05	PR26	Perennial	12 ft	6-10 in	Established bed and bank with flowing water; macroinvertebrates identified (*Trichoptera, Chironomidae*); Blacknose Dace (*Rhinichthys atratulus*) also noted
S-06	PR28/ PR29	Intermittent	10 in	2 in	Channel contains substrate but no water. Stream flows into W-03
S-07	PR38	Intermittent	1 ft	3 in	Channel contains substrate but no water. Flows into W-05
S-08	PR38	Perennial	1 ft	3 in	Water flows into W-05, but no macroinvertebrates identified
S-09	PR42	Perennial	6 ft	6-8 in	Established bed and bank with flowing water; macroinvertebrates identified (*Trichoptera, Chironomidae*)
S-10	PR47	Perennial	8 ft	8 in	Burdette Creek; Water cloudy due to recent rains; established bed and bank (approximately 8ft wide)
S-11	PR51	Perennial	3 ft	2 in	Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*)
S-12	PR51/ PR52	Intermittent	2 ft	NA	Established bed and bank with no flowing water
S-13	PR57	Perennial	3 ft	8 in	Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*)
S-14	PR67	Perennial	20 ft	6-10 in	Anglines Creek; Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*)
S-15	PR75	Intermittent	3 ft	NA	Established bed and bank but no flowing water; 2 AMD seeps flow into stream
S-16	PR76	Perennial	8 ft	18 in	Kern Branch; Heavy siltation present within stream bottom; Blacknose Dace (*Rhinichthys atratulus*) also noted
S-17	PR85/ PR86	Intermittent/ Perennial	10 in	1 in	Stream originated from drainage/seep; no macroinvertebrates noted
S-18	PR87/ PR88	Perennial	3 ft	6 in	Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*); stream splits in corridor then reconverges outside of the project corridor

Stream ID	Location	Type	Estimated Width	Estimated Depth	Notes
S-19	PR94	Perennial	20 ft	2 ft	Hominy Creek; bank erosion noted in areas as well as fish (not identified)
S-20	PR97	Perennial	3 ft	4 in	Outflow of W-07; high gradient stream with established bed and bank
S-21	PR98/ PR99	Perennial	3 ft	3 in	Slight erosion on stream banks noted
S-22	PR102	Perennial	2 ft	6 in	Stream flows through W-11; macroinvertebrates sampled include *Trichoptera* and *Chironomidae*
S-23	PR103	Perennial	1 ft	6 in	Established banks with *Chironomidae* noted
S-24	PR106/ PR107	Perennial	2 ft	8 in	Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Diptera* and *Chironomidae*);
S-25	PR116	Perennial	10 ft	12 in	Roaring Creek; Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*);
S-26	PR118	Perennial	10 ft	10 in	Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*);
S-27	PR122	Perennial	10 ft	8 in	Established bed and bank, good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Diptera* and *Chironomidae*);
S-28	PR134	Perennial	20 ft	1 ft +	Unnamed tributary to Hominy Creek; good substrate with flowing water; macroinvertebrates identified (*Plecoptera, Trichoptera, Chironomidae*);
S-29	PR138	Intermittent	1 ft	1 in	Originated from groundwater seeps outside of the study corridor
S-30	PR143	Perennial	1.5 ft	4 in	Originates in a recently timbered area; good substrate with flowing water; macroinvertebrates identified (*Trichoptera* and *Chironomidae*)
S-31	PR151	Perennial	1 ft	2 in	Banks degraded; forms around groundwater seep; macroinvertebrates identified (*Trichoptera* and *Chironomidae*)
S-32	PR153	Intermittent	2 ft	2 in	Stream flows subsurface for portions of the stream channel

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Appendix A

July 8, 2004 Letter from US Fish and Wildlife

May 25, 2004 Letter from West Virginia Department of Natural Resources

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
694 Beverley Pike
Elkins, West Virginia 26241

July 8, 2004

Mr. Fred Carey. P.E.
Project Manager
Potomac-Hudson Engineering, Inc.
4833 Rugby Avenue, Suite 100
Bethesda, Maryland 20814

Re: Environmental Impact Statement, Western Greenbrier Co-Gen, LLC, Co-Production Facility, Greenbrier County, West Virginia

Dear Mr. Carey:

This responds to your information request of 27 April 2004 regarding the potential impacts of a proposed project on federally listed endangered and threatened species and species of concern. Western Greenbrier Co-Gen, LLC, proposes to design, construct and operate an 85 MW ACFB power plant, which will burn 1,800 tons per day of waste coal for the generation of electricity and steam. The selected area is a 26-acre site near the town of Rainelle, in Greenbrier County, West Virginia. The initial site for acquiring waste coal is near Anjean, West Virginia.

Potomac-Hudson Engineering has requested impacts from this project on any endangered or threatened species within a 30-mile radius from the site for the preparation of an Environmental Impact Statement (EIS). This distance is requested due to the possible changes in atmospheric conditions that may occur from this power plant. These comments are provided pursuant to the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e).

Fish and Wildlife Surveys and Investigations

For the purposes of this report, impacts to federally listed endangered and threatened species have been separated into two different categories: *(1) Site Specific Impacts*, and *(2) 30-Mile Radius Impacts*. In addition, other impacts to fish and wildlife have been provided and are listed under the category: *(3) Other Impacts*.

(1) Site Specific Impacts:
Certain impacts can be attributed to the actual construction of the power plant and the associated features (rail-way, transmission lines, etc.). A check of our records indicate that only one federally listed species could occur in the project area, the endangered Indiana bat, Myotis sodalis.

The federally listed endangered Indiana bat may occur in the project area and could conceivably be adversely affected by the project proposal. The Indiana bat may use the project area for foraging and roosting between April 1 and November 15. Indiana bat summer foraging habitats are generally defined as riparian, bottomland, or upland forest, and old fields or pastures with scattered trees. Roosting/maternity habitat consists primarily of live or dead hardwood tree species, which have exfoliating bark that provides space for bats to roost between the bark and the bole of the tree. Tree cavities, crevices, splits, or hollow portions of tree boles and limbs also provide roost sites.

The U.S. Fish and Wildlife Service (Service) has determined the number of acres of suitable foraging and roosting habitat on the West Virginia landscape available to each Indiana bat, versus the total acreage of forest. On that basis, we have determined that small projects, outside of a five-mile radius of a hibernaculum and a two-mile radius of a capture site, affecting 17 acres or less of suitable forested habitat, will have a very small chance of resulting in direct or indirect take of the species, and therefore these effects are considered discountable.

If less than 17 acres of potential habitat for that species will be impacted, then no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required regarding the Indiana bat on a site-specific impact. Should project plans change, or if additional information on the Indiana bat becomes available, this determination may be reconsidered. If more than 17 acres of forested habitat will be impacted, further coordination with this office will be required for this site-specific concern.

(2) 30-mile radius impacts:
Several endangered and threatened species occur within the 30-mile radius from the proposed project site. They include the Indiana bat (Myotis sodalis), the Virginia big-eared bat (Corynorhinus townsendii virginianus), Virginia spiraea (Spiraea virginiana), the West Virginia Northern flying squirrel (Glaucomys sabrinus fuscus), small whorled pogonia (Isotria medeoloides), running buffalo clover (Trifolium stoloniferum), the northern riffleshell mussel (Epioblasma torulosa rangiana), the pink mucket pearly mussel (Lampsilis abrupta), and the fanshell mussel (Cyprogenia stegaria).

While the Service commends the energy community for providing lower emission power plants, federally protected species (as listed above) could be sensitive to even slight changes in atmospheric conditions. For example, the endangered West Virginia Northern flying squirrel is dependant upon a specific habitat type. Potential habitat for the West Virginia northern flying squirrel is defined as high elevation northern hardwood forest with a conifer component, usually of red spruce or hemlock. Other parameters indicative of potential habitat include abundant

large woody debris on the forest floor, cooler temperatures and higher humidity that promotes lichen growth and presence of moss, fern, liverwort or clubmoss groundcover. The cumulative effects from acid deposition may have a detrimental impact upon this type of habitat (especially those found in higher elevations and colder temperature regimes).

In addition, the three protected mussels species found within the 30-mile radius may show detrimental effects to changes in stream water pH and metal accumulation (aluminum, mercury, etc.) through contaminated rain and snowfall. Federally listed plants could also become indirectly impacted through acid deposition on soils, which may change the nutrient composition of the soils (calcium depletion, increasing sulfur and nitrogen, etc.).

Projected emissions were not included within your letter. Accurate emission figures, coupled with anticipated deposition rates, historical wind currents and rainfall amounts are necessary to determine environmental (and species specific) changes through atmospheric deposition (via modeling). Until this is complete, we cannot determine the long-range impact to listed species.

(3) *Other Impacts:*
Of particular concern are impacts to other fish and wildlife resources that stem from the storage and disposal of waste materials generated at coal burning plants. This waste material is generally composed of noncombustible materials (minerals) and can be either collected within the flue stacks (fly ash) or as heavier bottom ash. Your letter states that the Woodbrik manufacturing plant will use a portion of this ash (along with other materials) in the construction of bricks. Your letter goes on to state that excess ash will also be used to remediate acid mine drainage (AMD) from the source waste coal piles. The Service not only recognizes the problems in water quality associated with AMD, but also the potential for ash to release high levels toxic metals within the stream environment. The Service cannot recommend trading one environmental problem for another, potentially more serious one. Therefore the Service recommends a proper study of the composition of the ash to be used, as well as the expected dissolution of toxic metals within the downstream environment and all associated cumulative health risks to fish and wildlife. Alternate disposal areas should also be considered in order to minimize any potential risks to water quality.

Typically, power plants discharge water at permitted sites covered under the National Pollutant Discharge Elimination System (NPDES) permitting procedures. While your letter states that the power plant will provide hot water and steam for nearby businesses, it is not clear if all waste water will be processed in this manner or if some portion will be discharged into the environment. Discharged water may contain biocides and other additives used to control algae and bacteria within the power plant lines. This, as well as the extreme temperatures may be harmful to surface and groundwater quality. Possible discharge sites should be explored in order to provide for the least damaging alternative.

Conclusion

Overall, the purpose of this project remains unclear. There was no indication within your letter that the construction of this power plant would alleviate a power deficiency within West

Virginia. In fact, your letter does not mention any type of alternatives that have been considered prior to the preparation of an EIS or the implementation of the National Environmental Policy Act (NEPA) process. The NEPA process should assist with the procedures of choosing the appropriate alternative, instead of supporting the choice made prior to the NEPA implementation. With this in mind, alternate locations should be considered so that those who benefit from the electricity generated from this plant would also be responsible for the proper disposal and control of the inherent pollution.

If you have any questions regarding this letter, please contact Mr. Monte Matthews of my staff at (304) 636-6586, or at the letterhead address.

Sincerely,

Thomas R. Chapman
Field Supervisor

DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Operations Center
P.O. Box 67
Elkins, West Virginia 26241-3235
Telephone (304) 637-0245
Fax (304) 637-0250

Bob Wise
Governor

Ed Hamrick
Director

May 25, 2004

Mr. Fred Carey
Potomac-Hudson Engineering, Inc.
4833 Rugby Avenue, Suite 100
Bethesda, MD 20814

Dear Mr. Carey:

We have reviewed our files for information on rare, threatened, and endangered (RTE) species in the area the proposed Western Greenbrier Co-Gen, LLC Co-Production Facility in Rainelle, Greenbrier County, West Virginia. There are no known occurrences of RTE species at the Rainelle site, nor do we have any known occurrences at the Anjean waste coal piles.

Enclosed is a compact disc containing a list of RTE species currently known from Greenbrier County (GreenbrierCounty.doc), RTE species within a 30-mile radius of Rainelle (RainelleData.xls), and an explanation of our ranking system denoting species rarity (Rankexpl.doc). The table below lists federally protected species within the boundaries of your project description:

Name	Status*	Comments
Greenbrier County		
Shale barren rockcress (*Arabis serotina*)	LE	Restricted to shale barrens of Greenbrier, Hardy, and Pendleton counties.
Northern flying squirrel (*Glaucomys sabrinus fuscus*)	LE	Restricted to the higher elevations of the mountain counties (Greenbrier, Pendleton, Pocahontas, Randolph, Tucker, Webster); in areas with red spruce or a conifer component.
Small-whorled pogonia (*Pogonia medeoloides*)	LT	Currently known from only Greenbrier County; does not appear restricted to a specific habitat.

Indiana bat (*Myotis sodalis*)	LE	Hibernates in caves in Greenbrier, Hardy, Mercer, Monroe, Pendleton, Pocahontas, Preston, Randolph, and Tucker counties; documented as utilizing mine portals in Fayette and Raleigh counties as summer roosts; also utilizes trees as roosts; suspected maternity site in Boone County in 2003.
Virginia spiraea (*Spiraea virginiana*)	LT	A riparian shrub known to occur along the Bluestone, Greenbrier, Gauley, and Meadow rivers; additional non-riparian sites in Raleigh County.
30-MILE RADIUS OF RAINELLE		
Shale barren rockcress (*Arabis serotina*)	LE	See comments above.
Virginia big-eared bat (*Corynorhinus townsendii virginianus*)	LE	Utilizes caves as hibernacula and maternity colonies in Grant, Hardy, Pendleton, Preston, Randolph, and Tucker counties; utilizes mine portals as summer and fall roosts
Fanshell mussel (*Cyprogenia stegaria*)	LE	Known from the Kanawha River in Fayette County and the Ohio River in Wood and Jackson counties.
Northern riffleshell (*Epioblasma torulosa rangiana*)	LE	Known from the only the Kanawha River in Fayette and Kanawha counties.
Northern flying squirrel (*Glaucomys sabrinus fuscus*)	LE	See comments above.
Small-whorled pogonia (*Pogonia medeoloides*)	LT	See comments above.
Pink mucket pearly mussel	LE	Known from the Kanawha River in Fayette and Kanawha counties, and the Ohio River in Cabell, Mason, and Wood counties.
Indiana bat (*Myotis sodalis*)	LE	See comments above.
Virginia spiraea (*Spiraea virginiana*)	LE	See comments above.
Running buffalo clover (*Trifolium stoloniferum*)	LE	Found in disturbed areas in old jeep trails, logging roads, skid rows, etc. in Barbour, Brooke, Fayette, Pendleton, Pocahontas, and Randolph counties; historically known from Preston and Webster counties.

*LE = endangered; LT = threatened

This response is based on information currently available and should not be considered a comprehensive survey of the areas under review. We hope you find this information helpful in your planning process.

Enclosed please find an invoice.

Thank you for contacting us and please call if you should have any questions.

Sincerely,

Barbara Sargent
Environmental Resources Specialist
Wildlife Diversity Program

enclosures

FIGURES

FIGURE 1
PROPOSED ELECTRIC TRANSMISSION ROW

Western Greenbrier Co-Generation LLC

0 5,000 10,000 20,000 30,000 Feet

1:70,000

URS

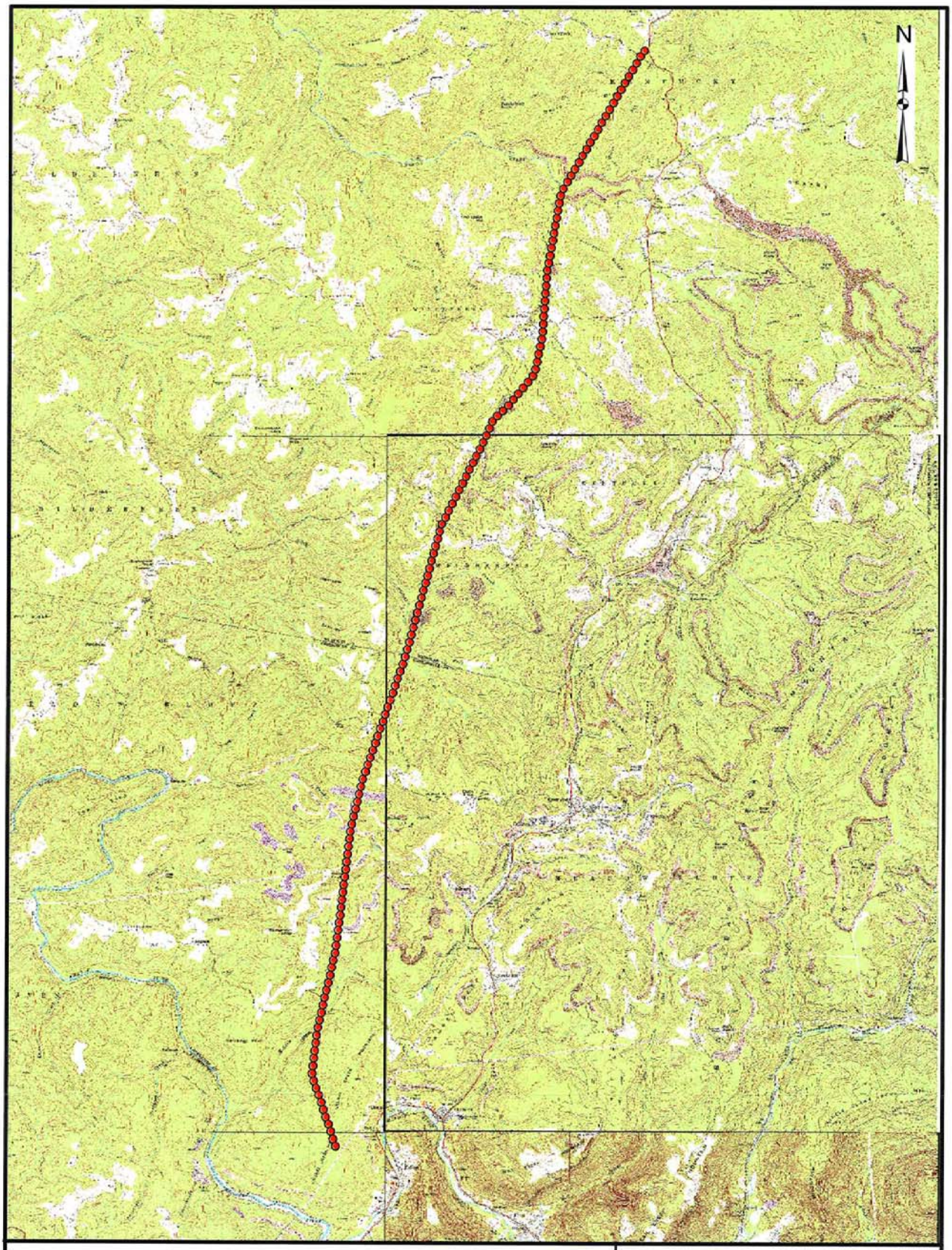

FIGURE 2
PROPOSED ELECTRIC TRANSMISSION ROW

Western Greenbrier Co-Generation LLC

0 5,000 10,000 20,000 30,000 Feet

1:70,000

URS

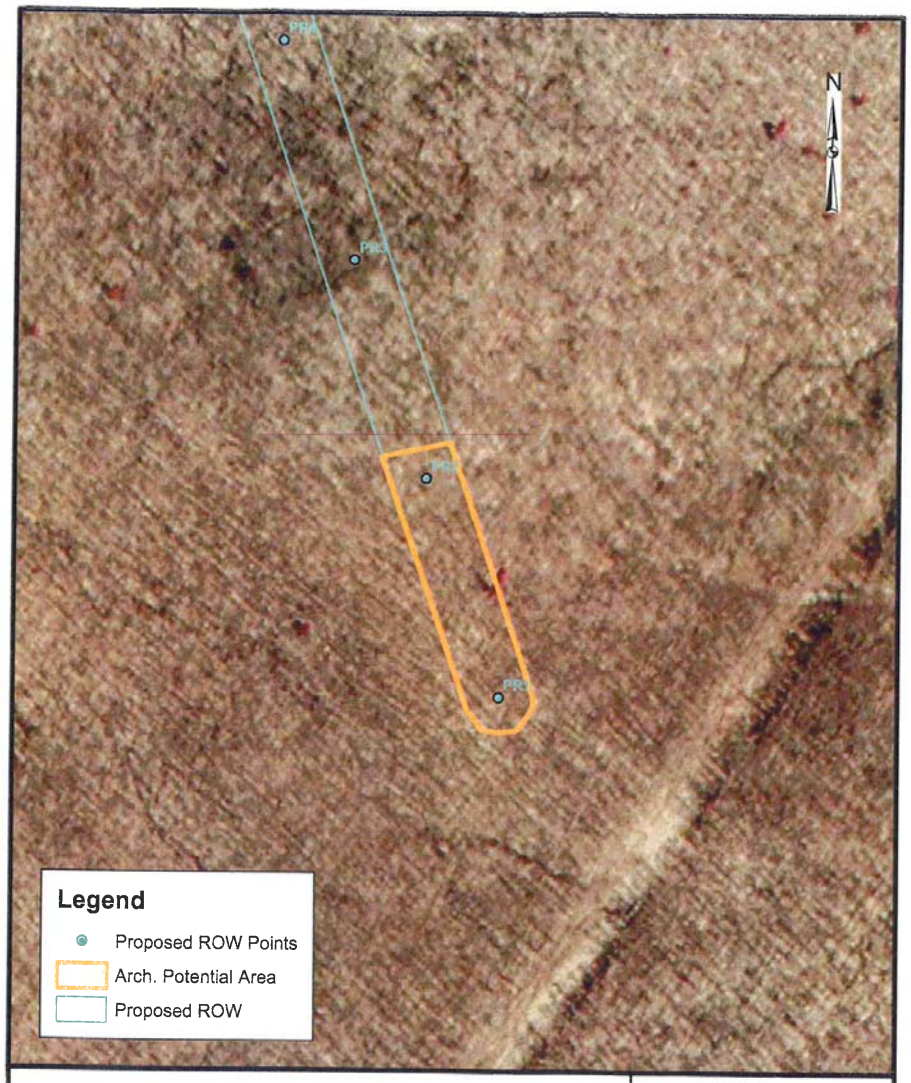

FIGURE 3
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

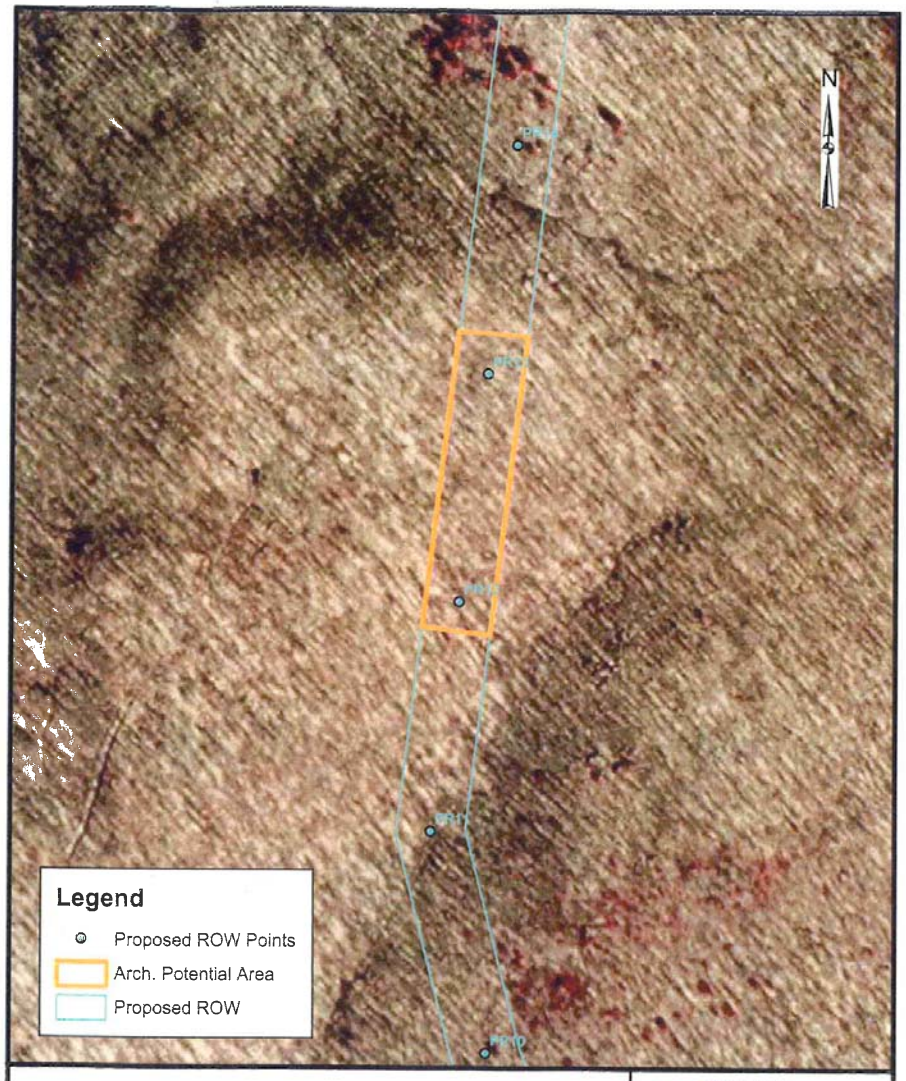

FIGURE 4
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

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URS

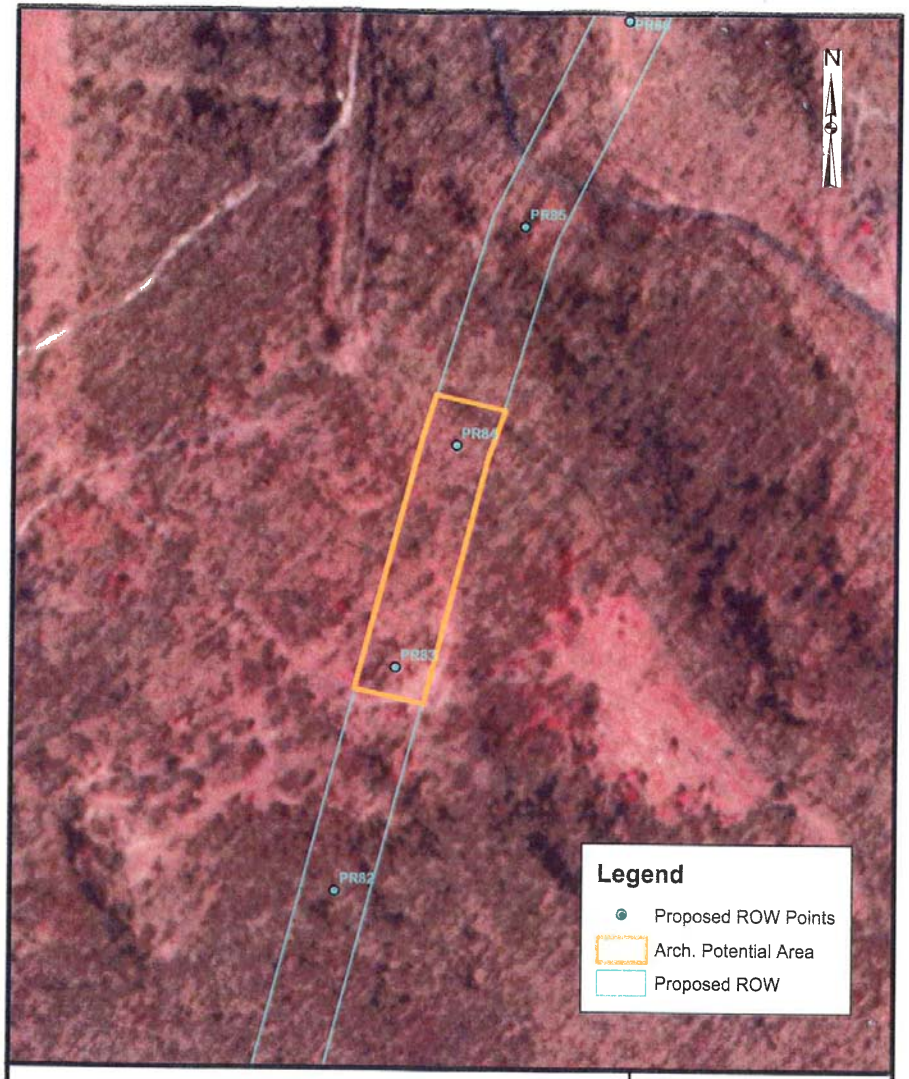

FIGURE 5
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

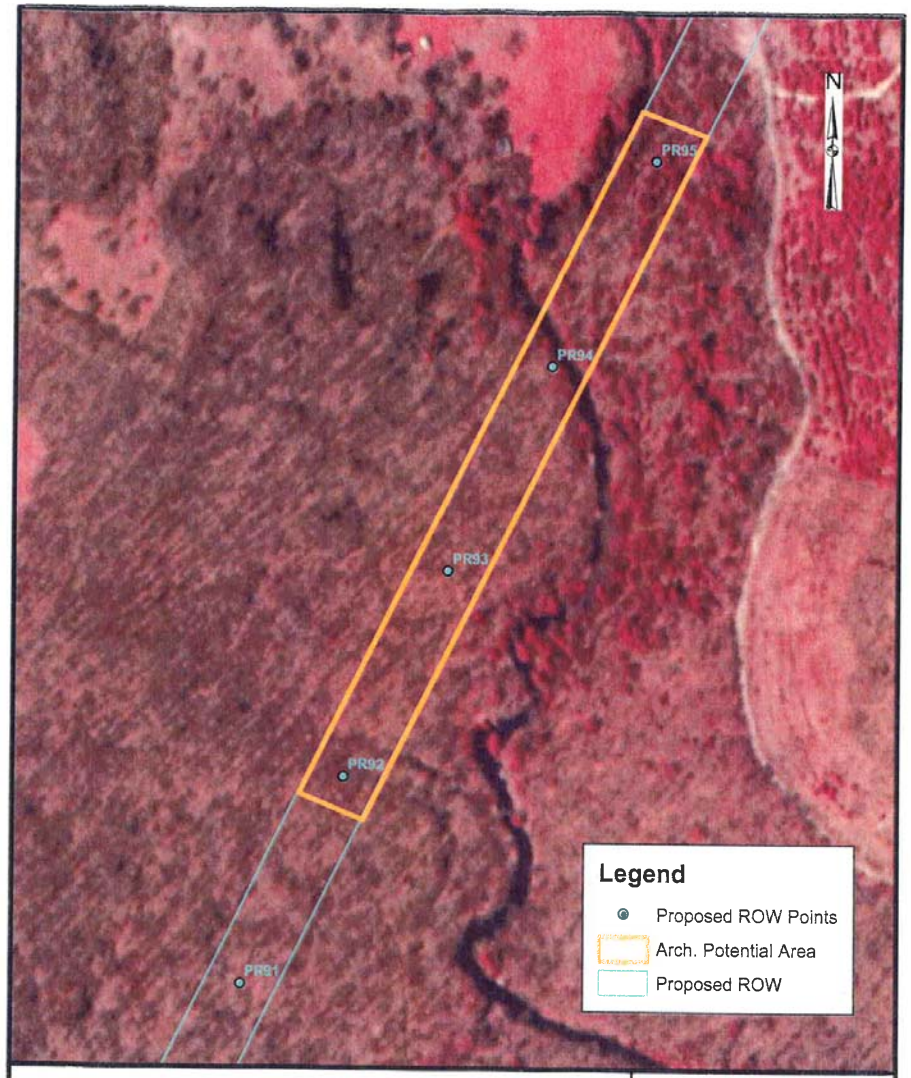

FIGURE 6
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

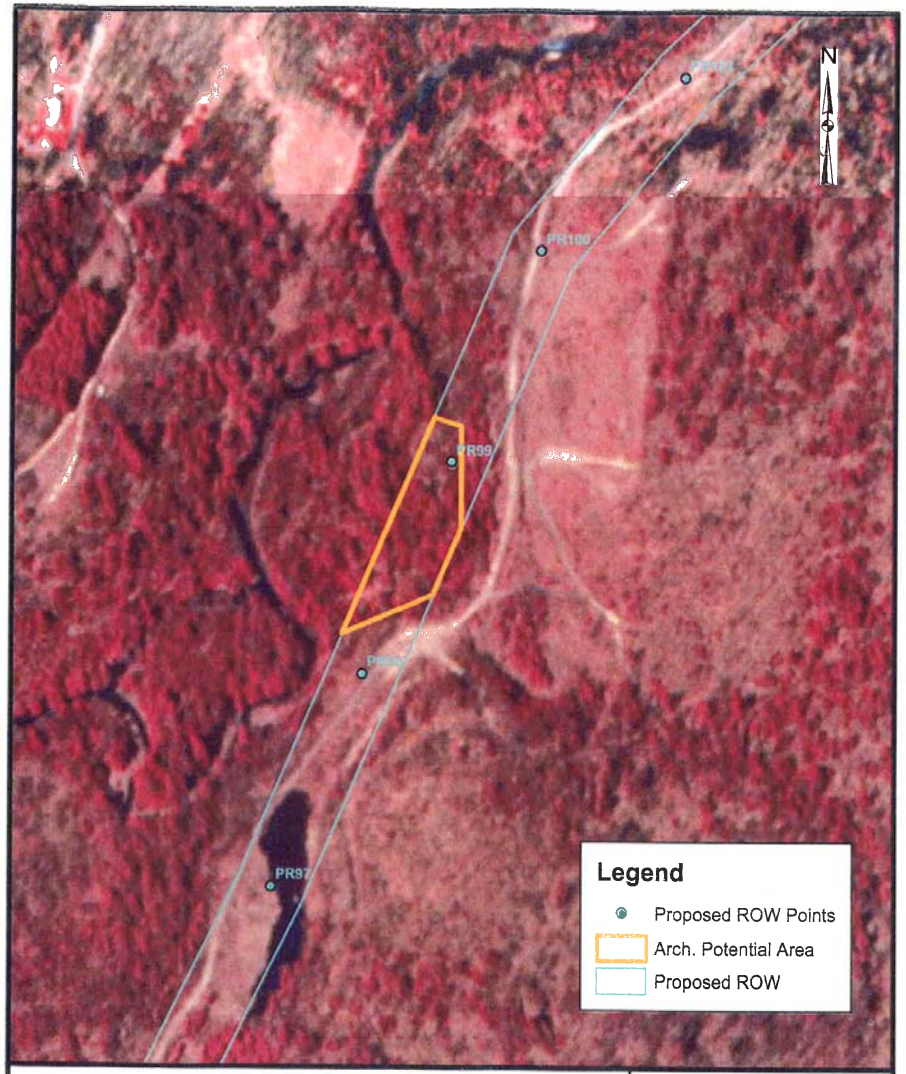

FIGURE 7
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

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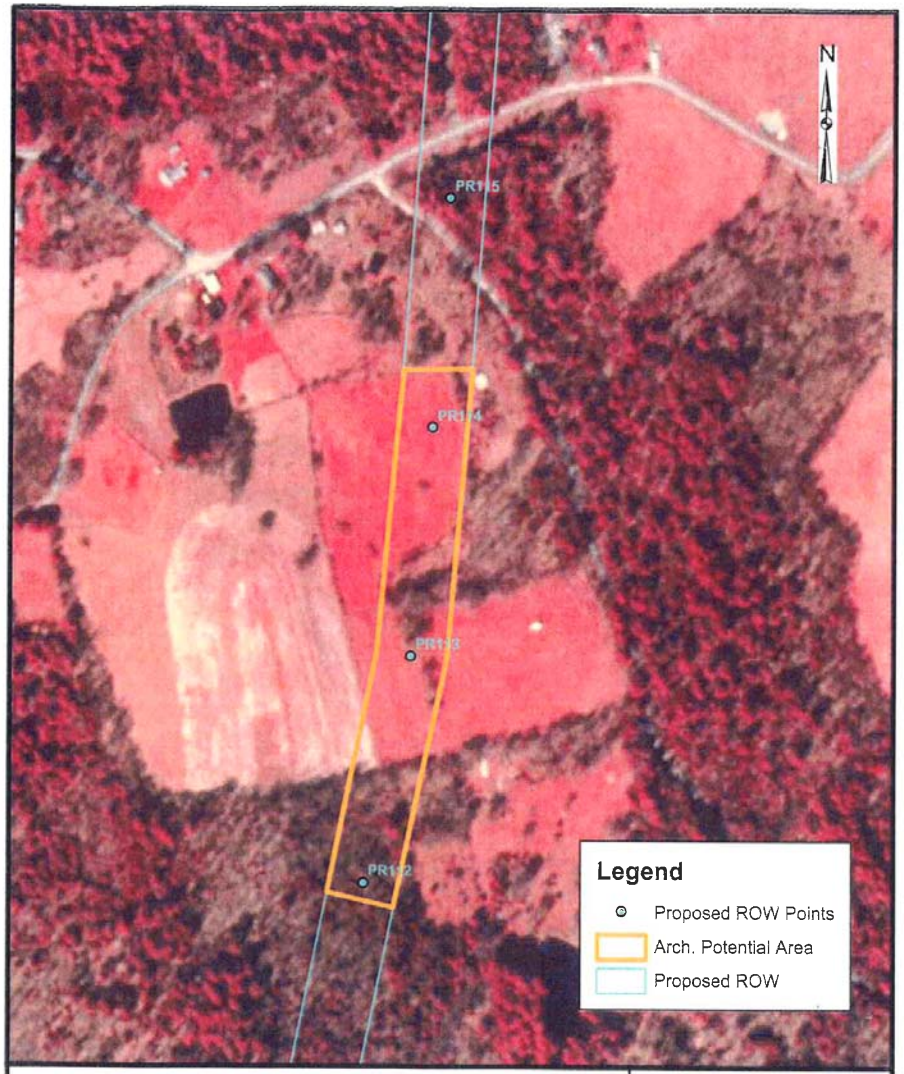

FIGURE 8
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

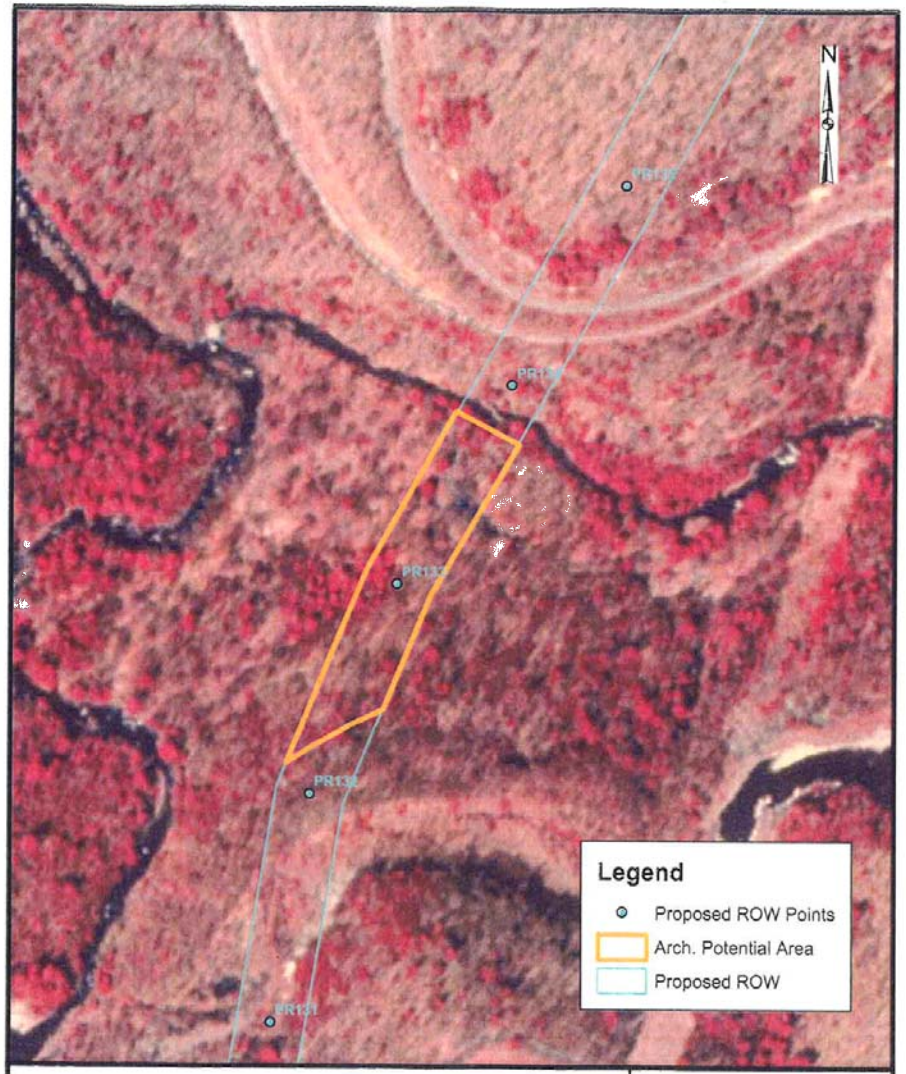

FIGURE 9
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

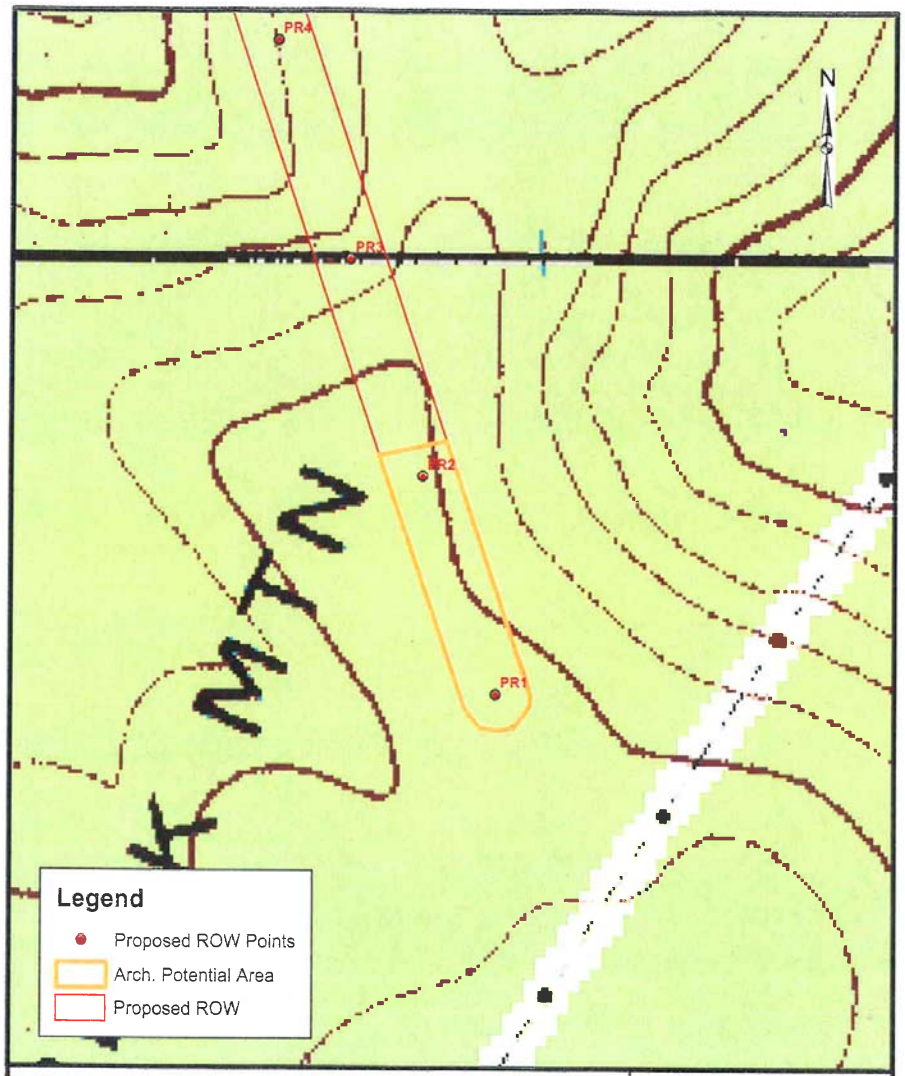

FIGURE 10
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

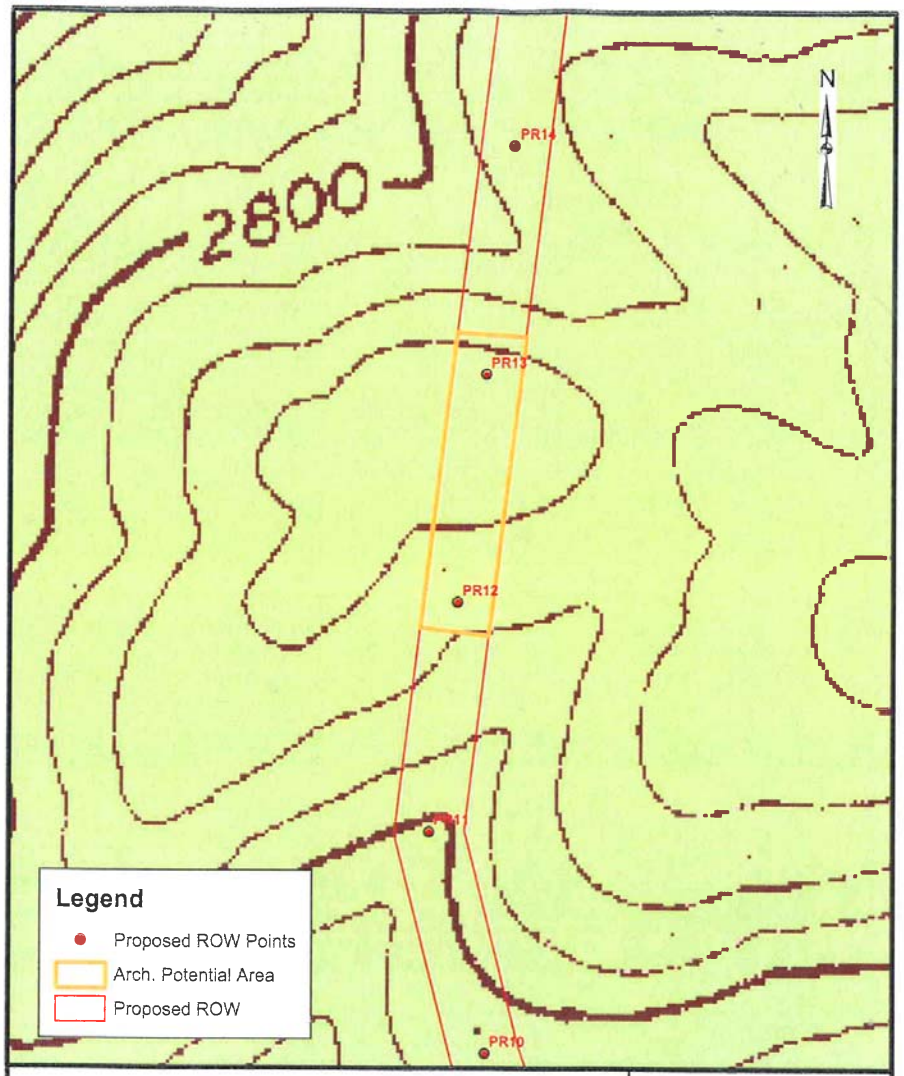

FIGURE 11
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

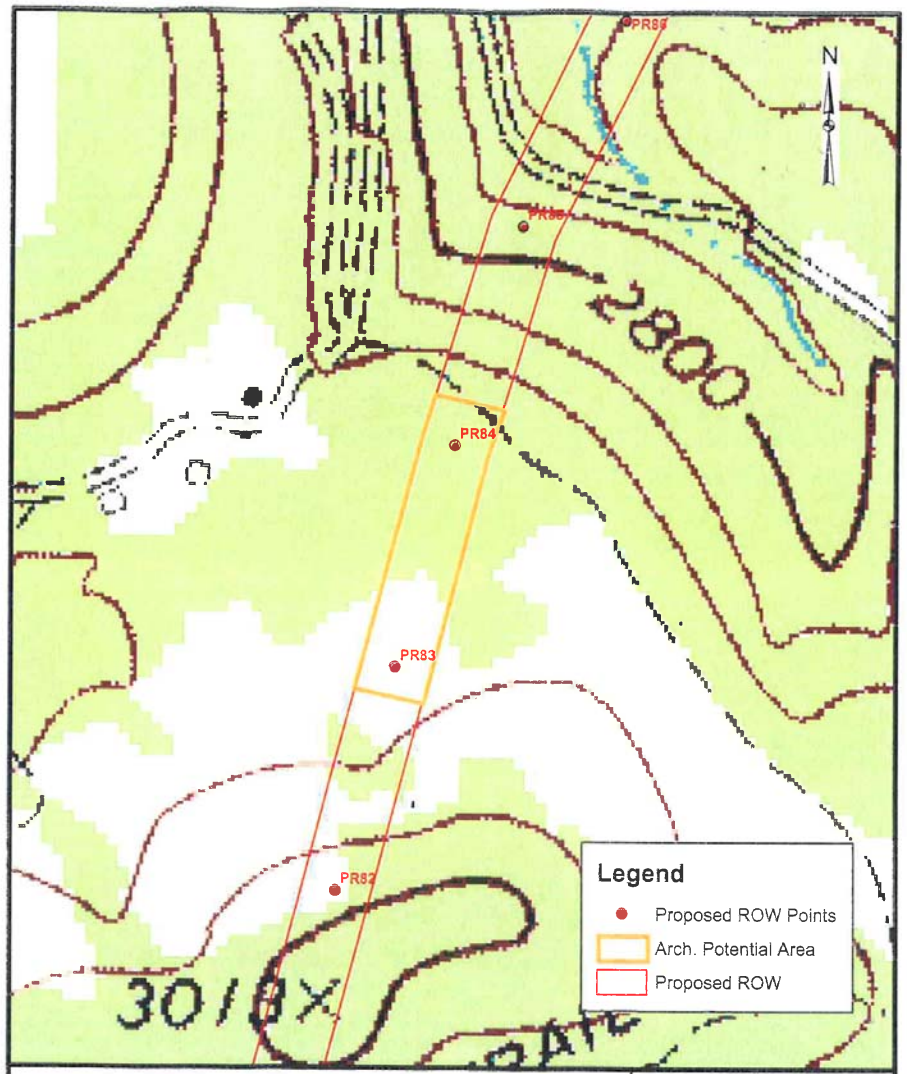

FIGURE 12
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

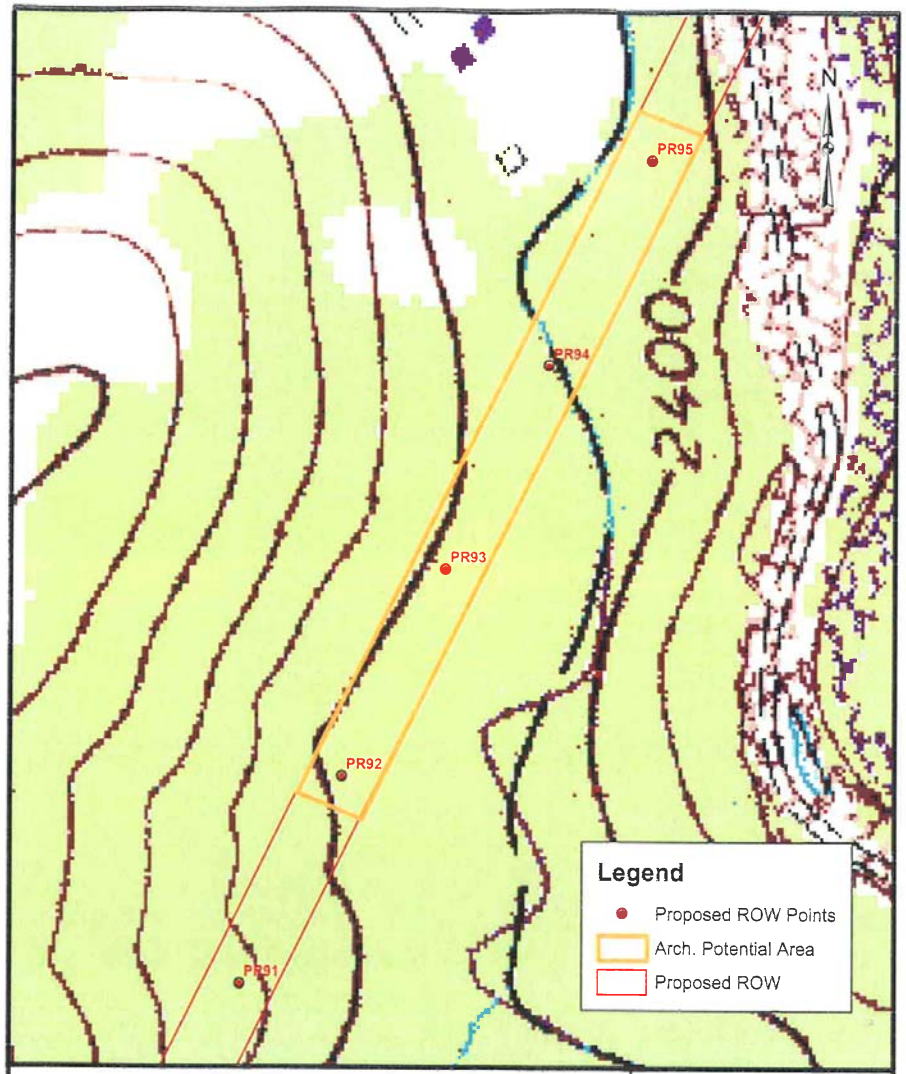

FIGURE 13
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

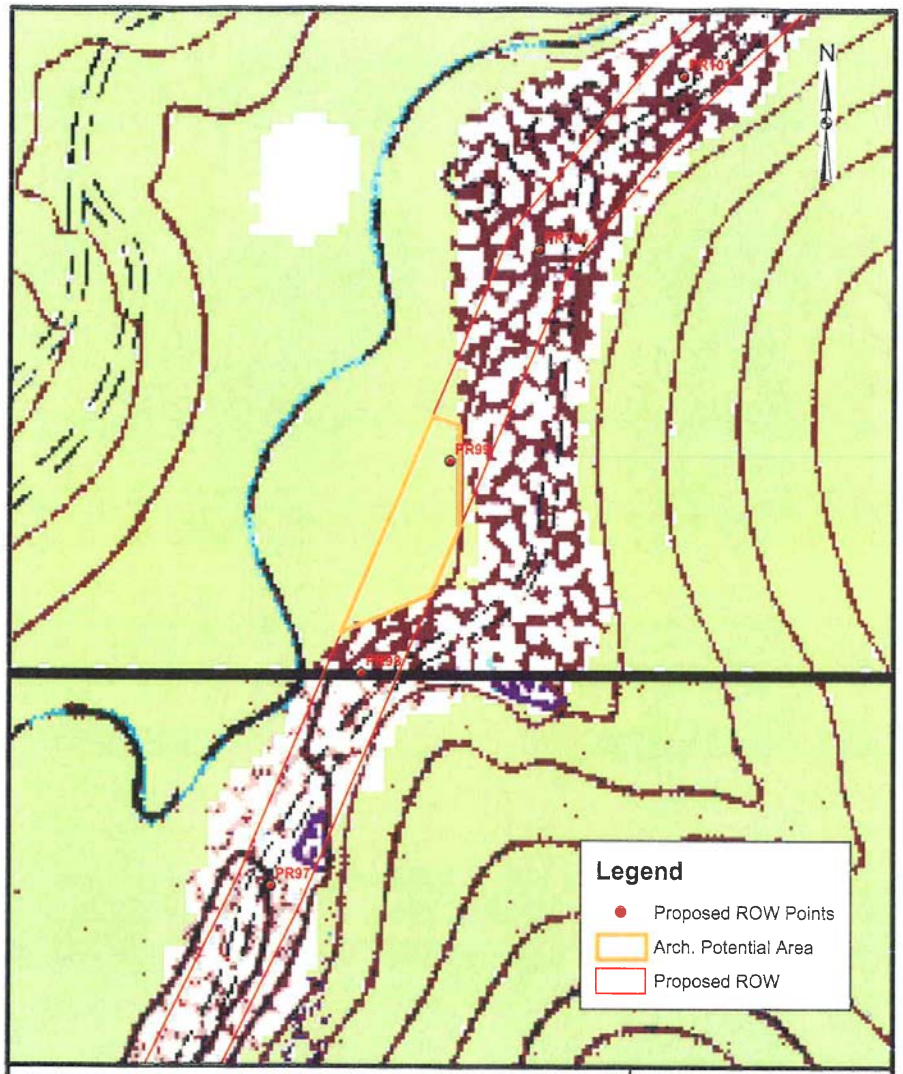

FIGURE 14
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

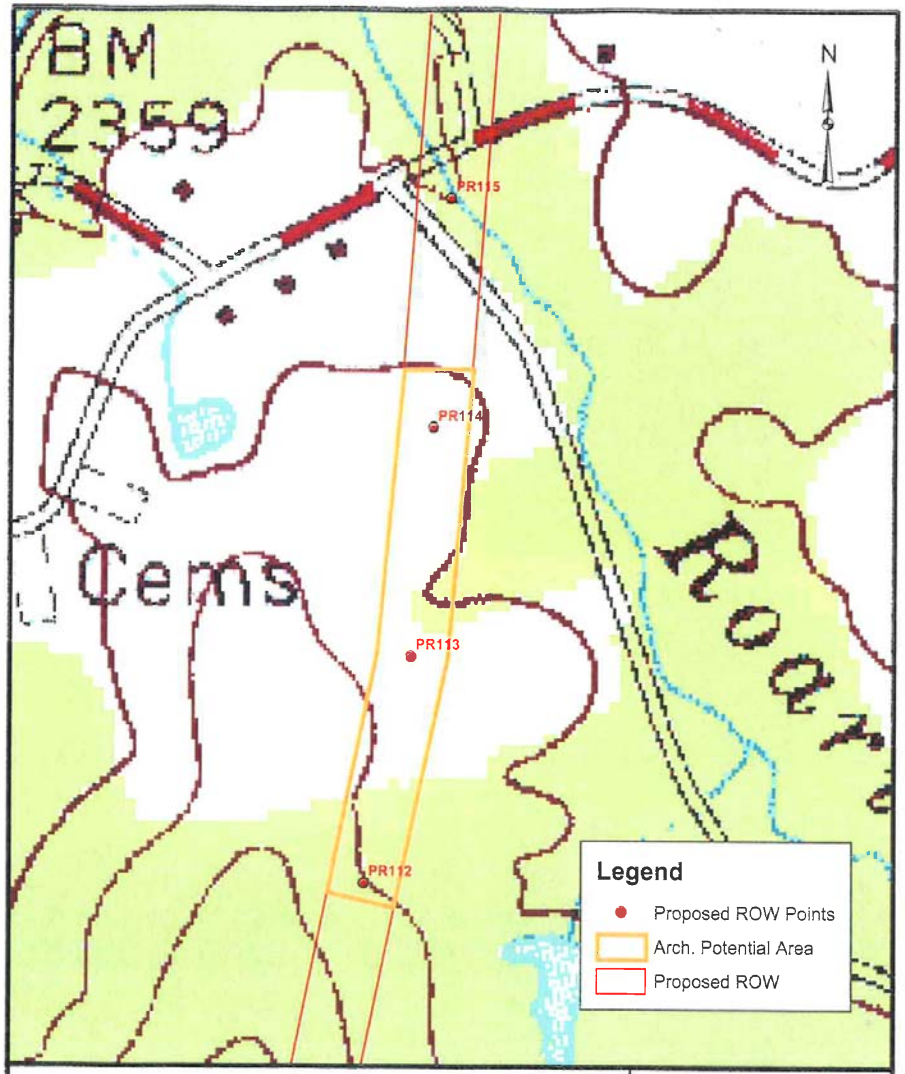

FIGURE 15
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

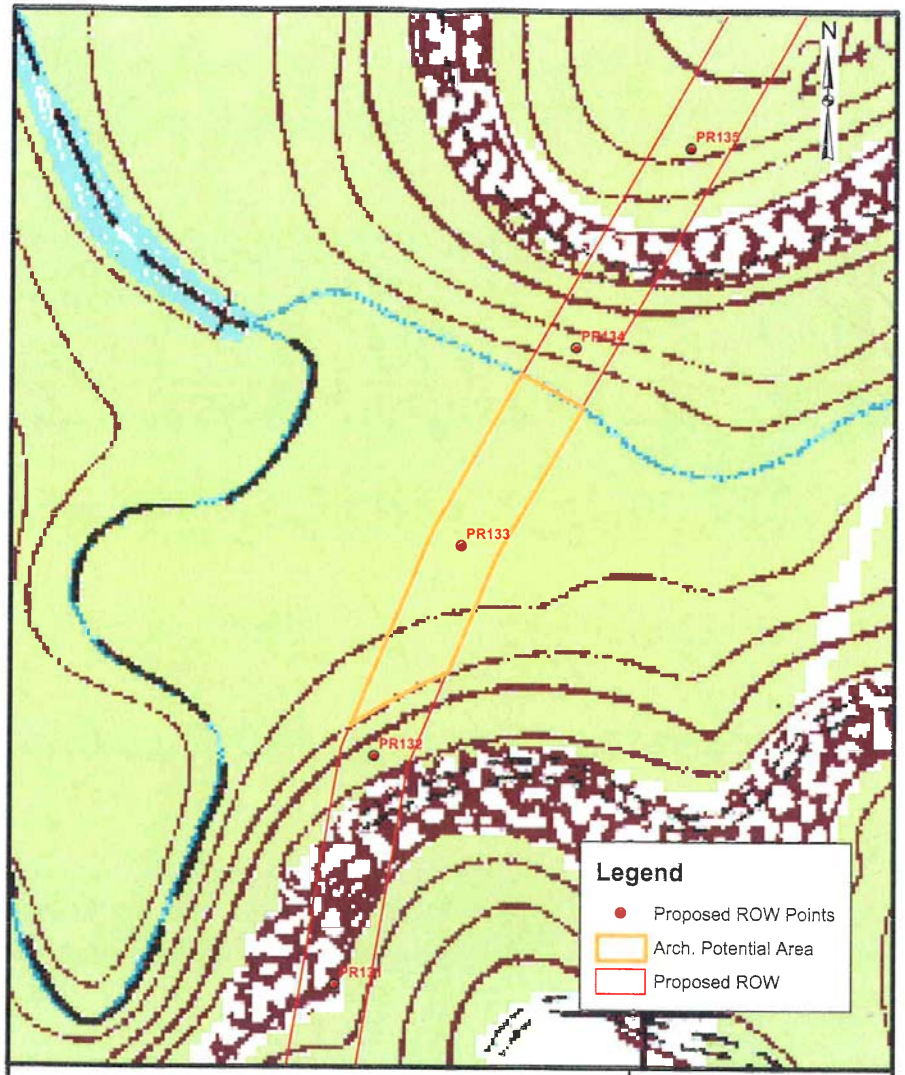

FIGURE 16
AREAS OF MODERATE ARCHAEOLOGICAL POTENTIAL

Western Greenbrier Co-Generation LLC

0 125 250 500 750 Feet 1:3,000

URS

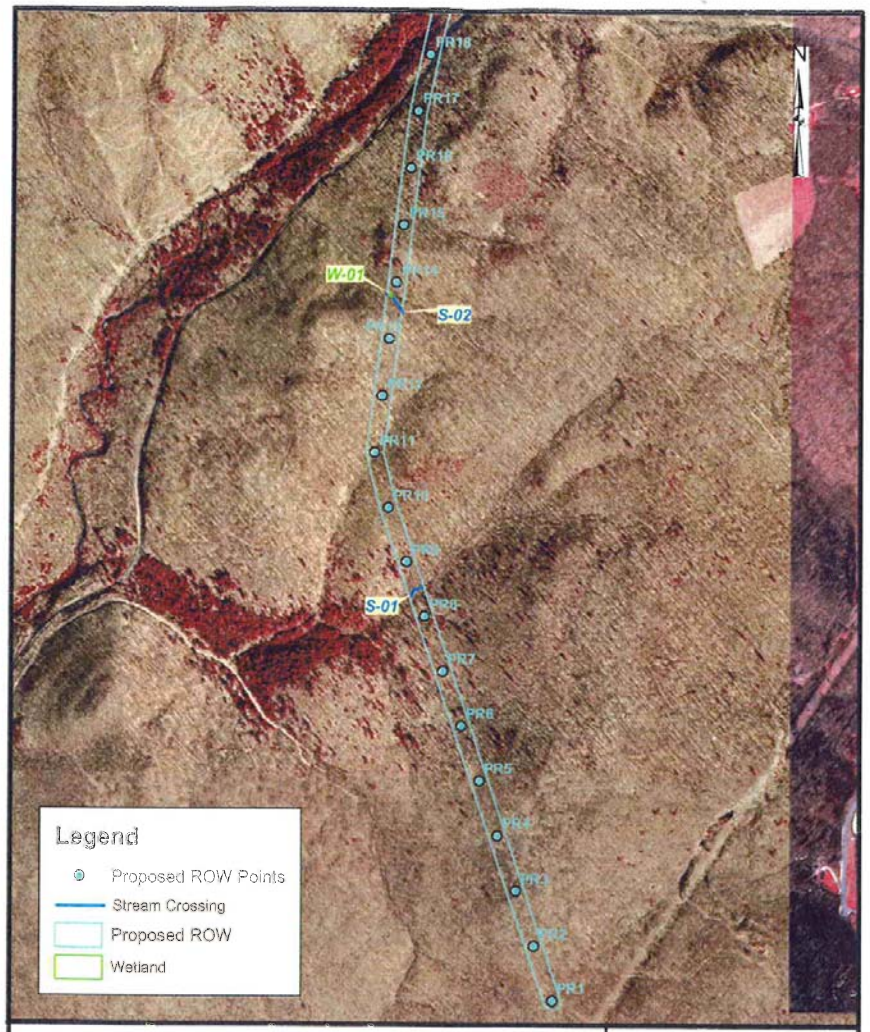

FIGURE 17
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet

1:12,000

URS

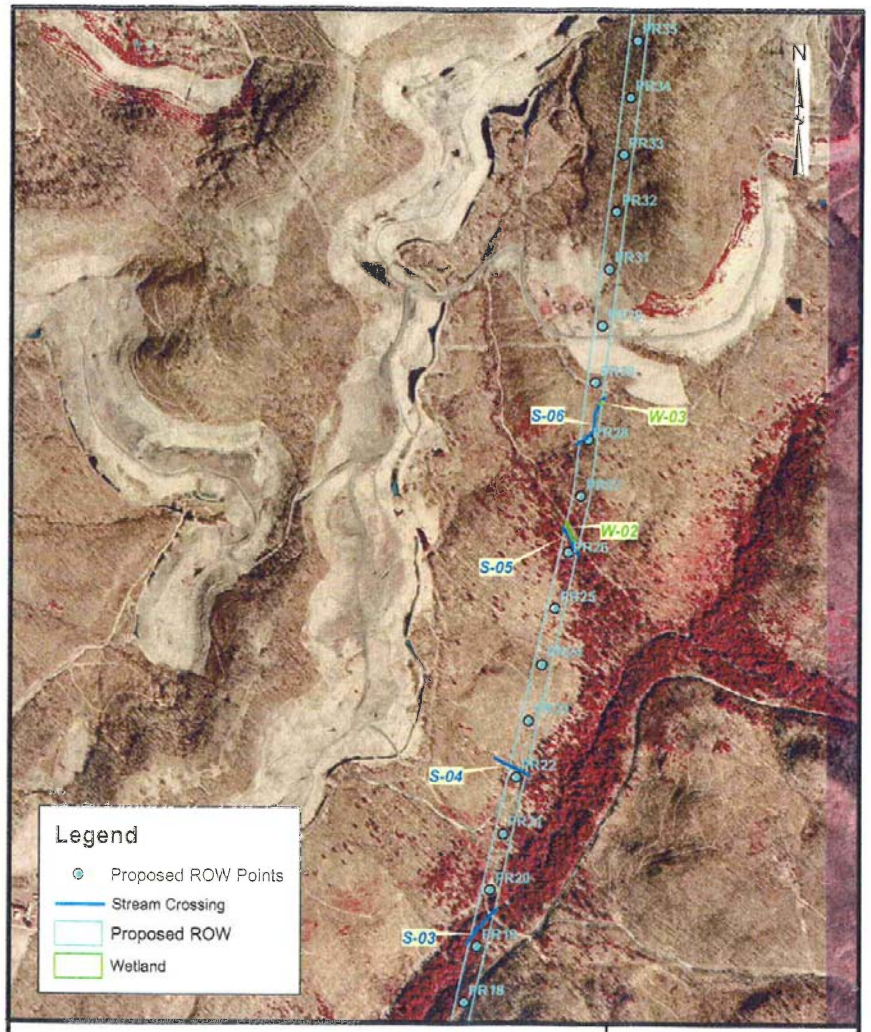

FIGURE 18
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet

1:12,000

URS

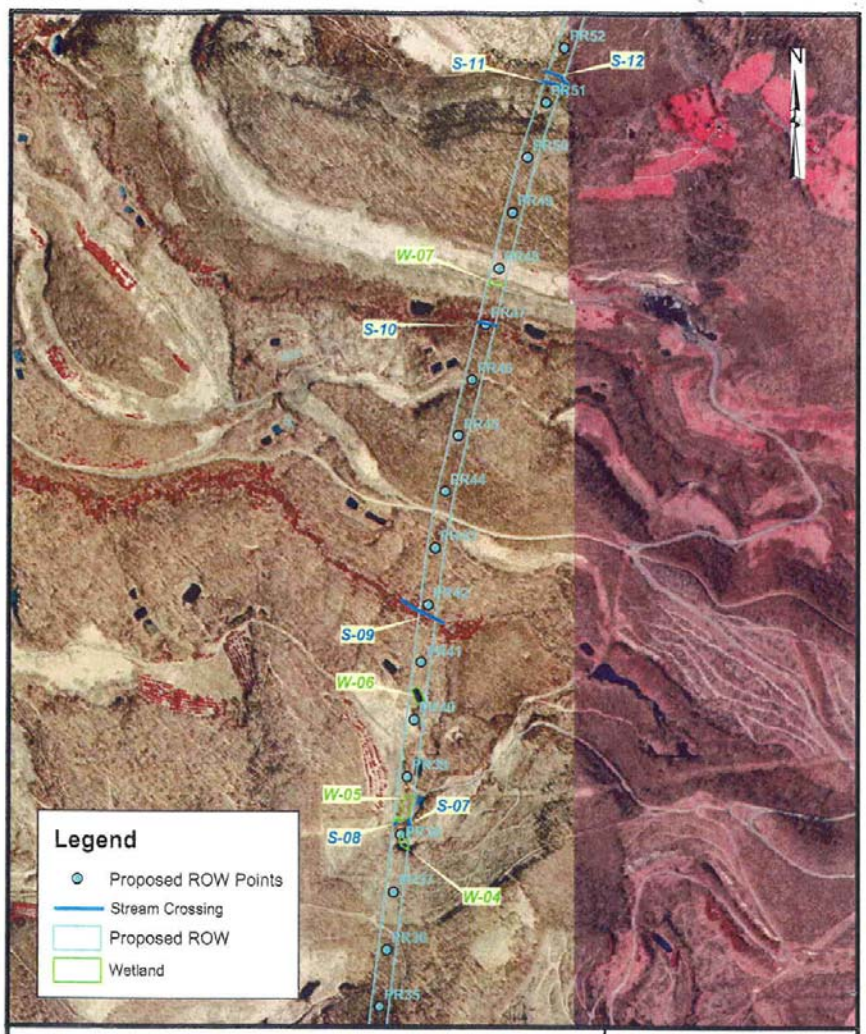

FIGURE 19
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

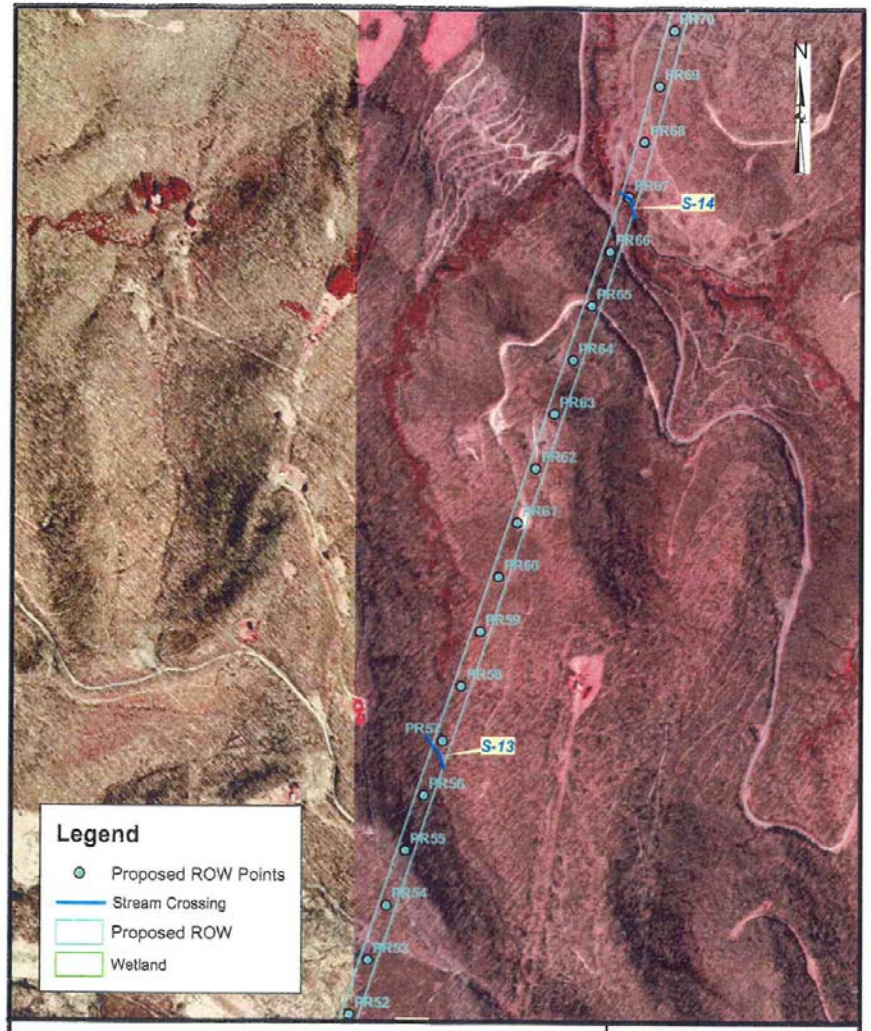

FIGURE 20
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

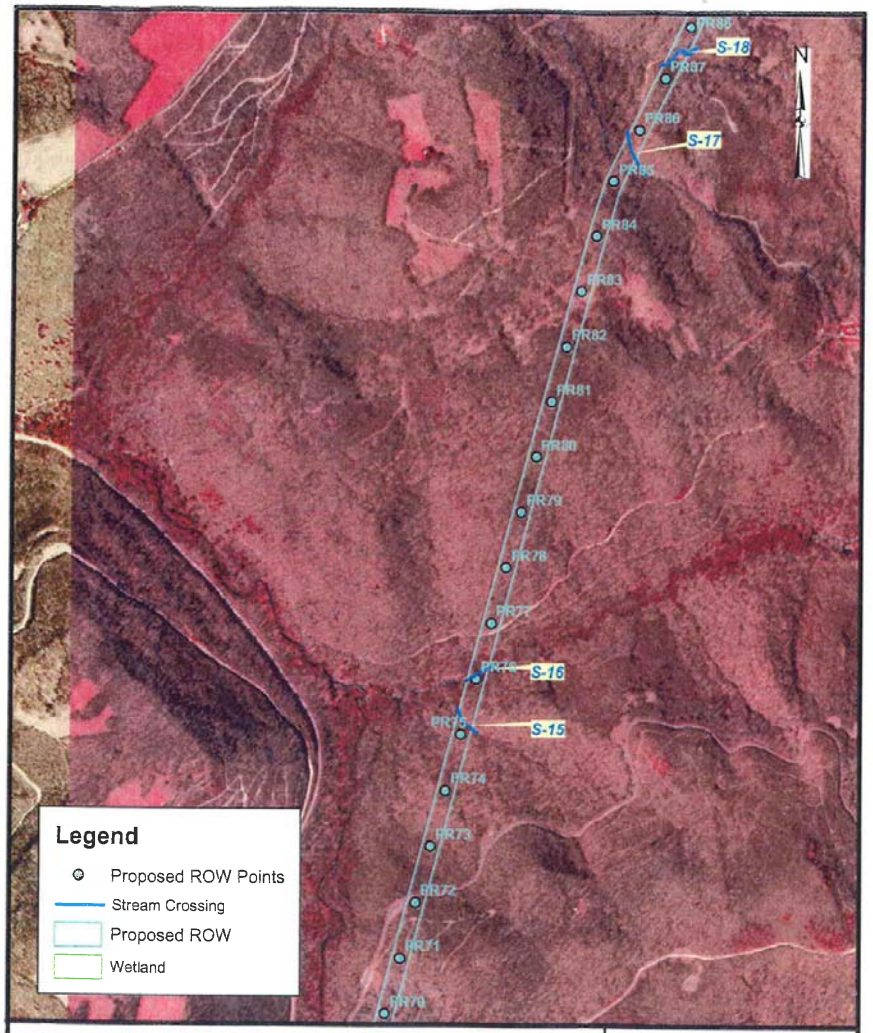

FIGURE 21
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

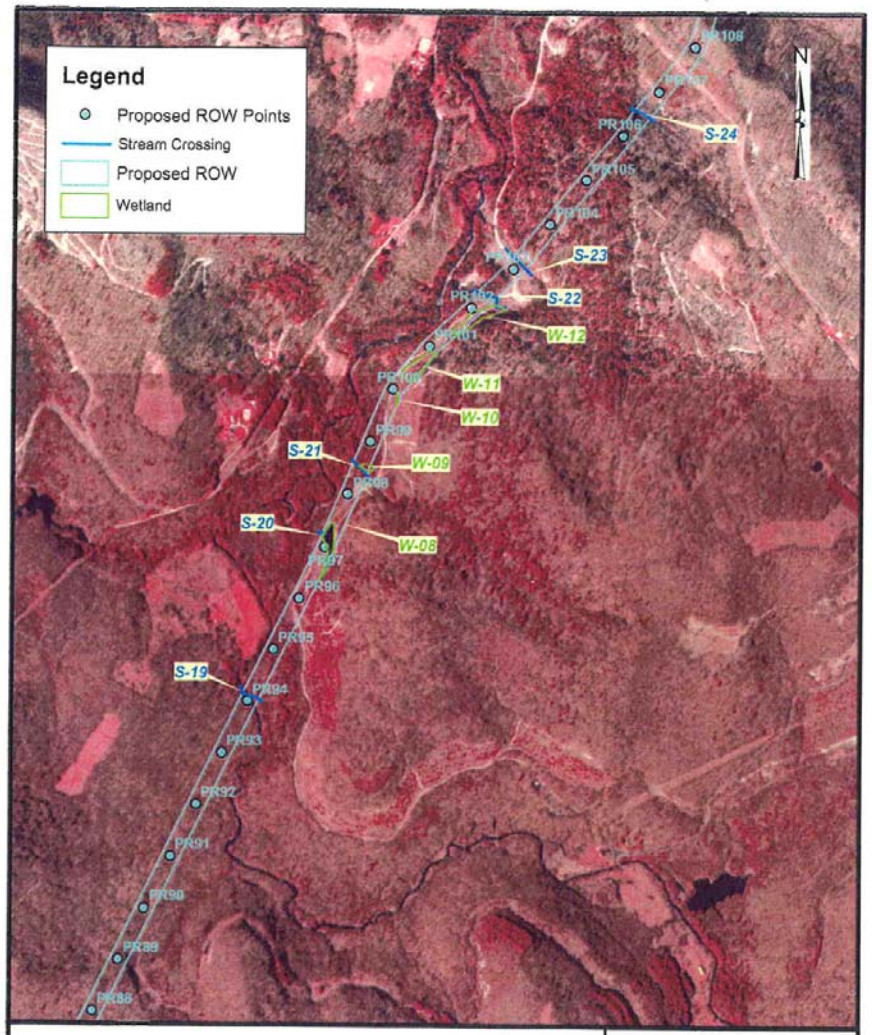

FIGURE 22
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

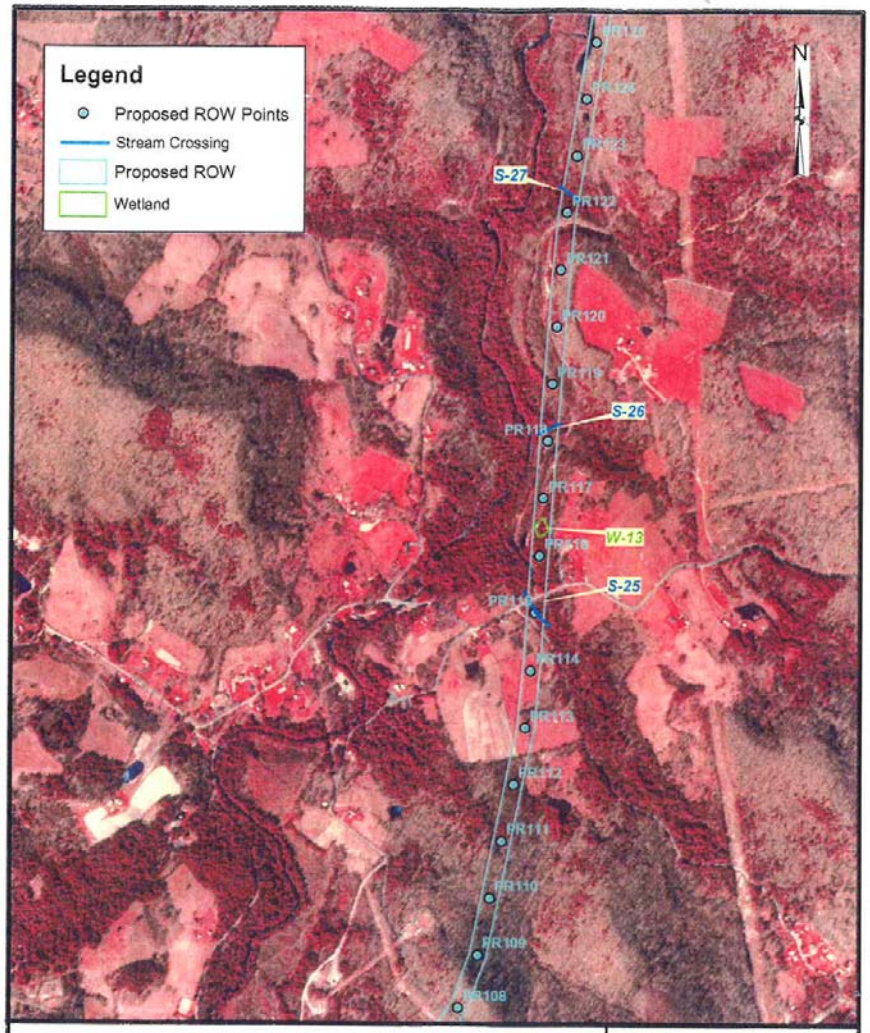

FIGURE 23
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

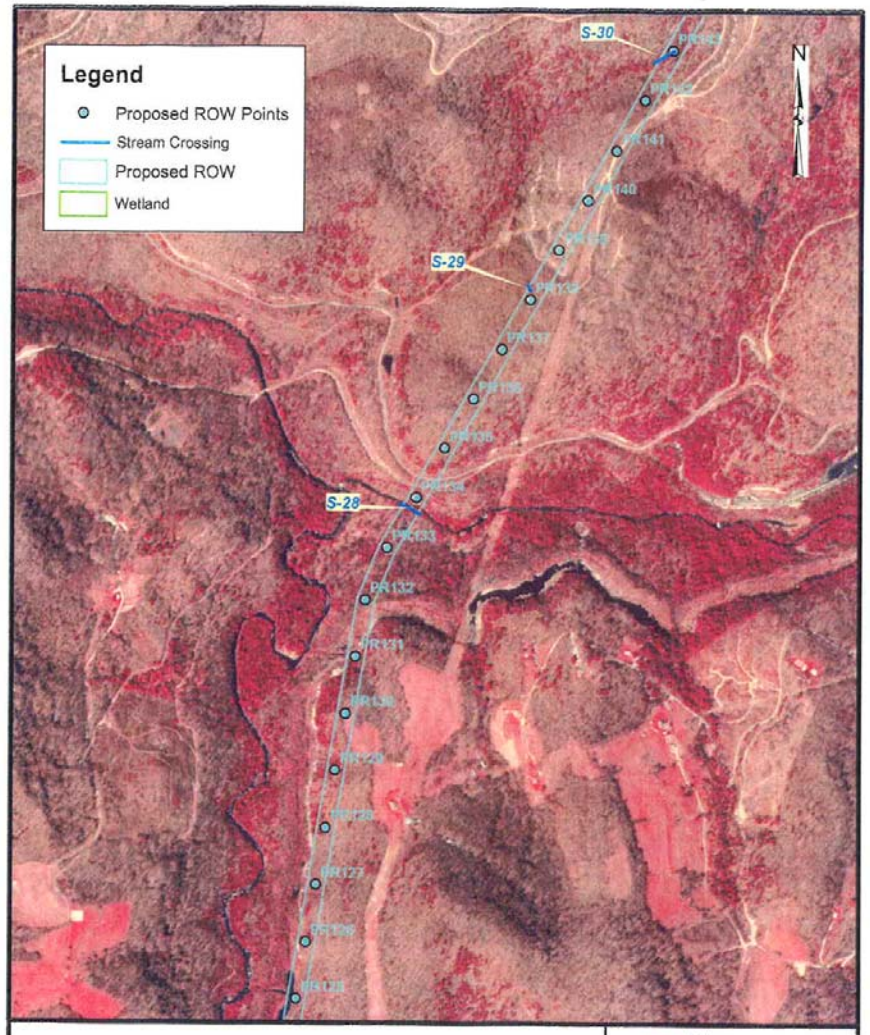

FIGURE 24
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

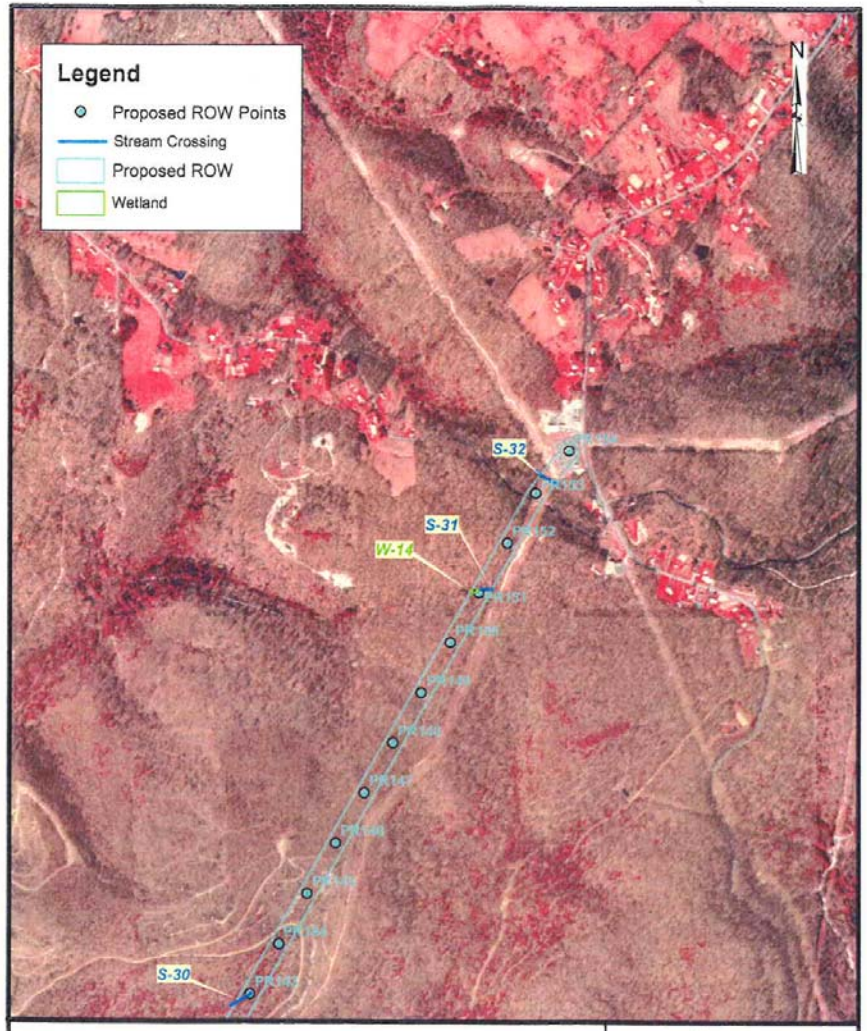

FIGURE 25
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

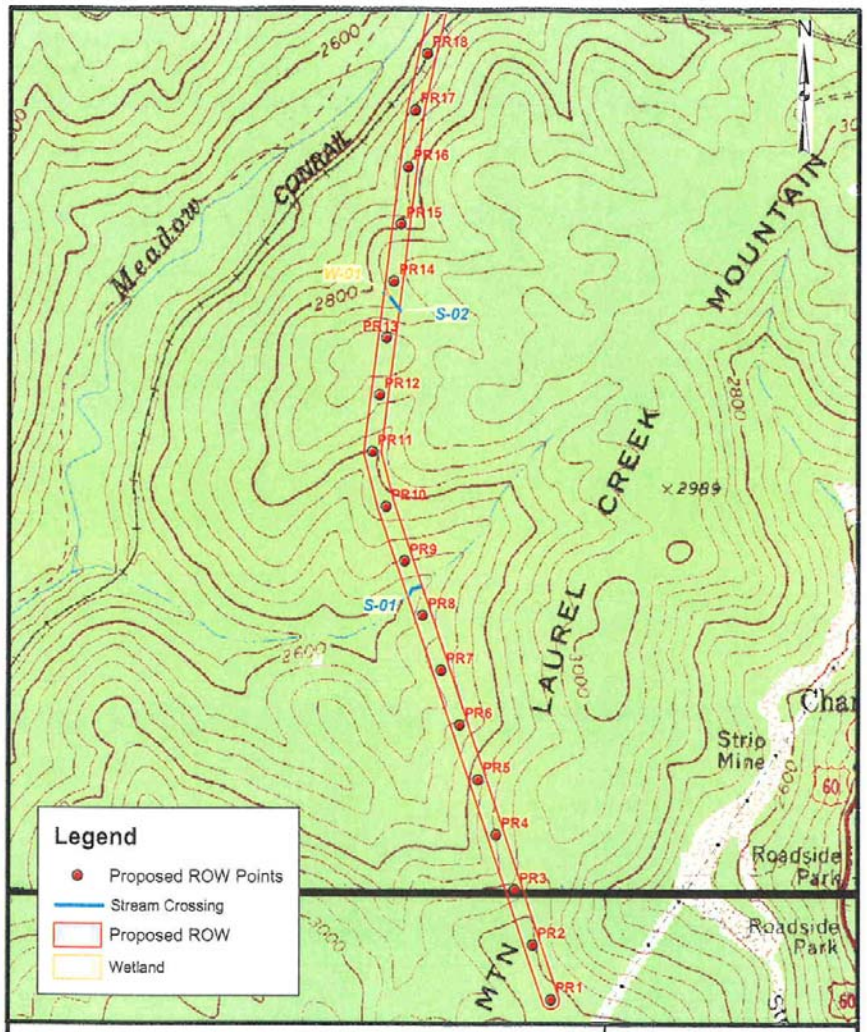

FIGURE 26
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

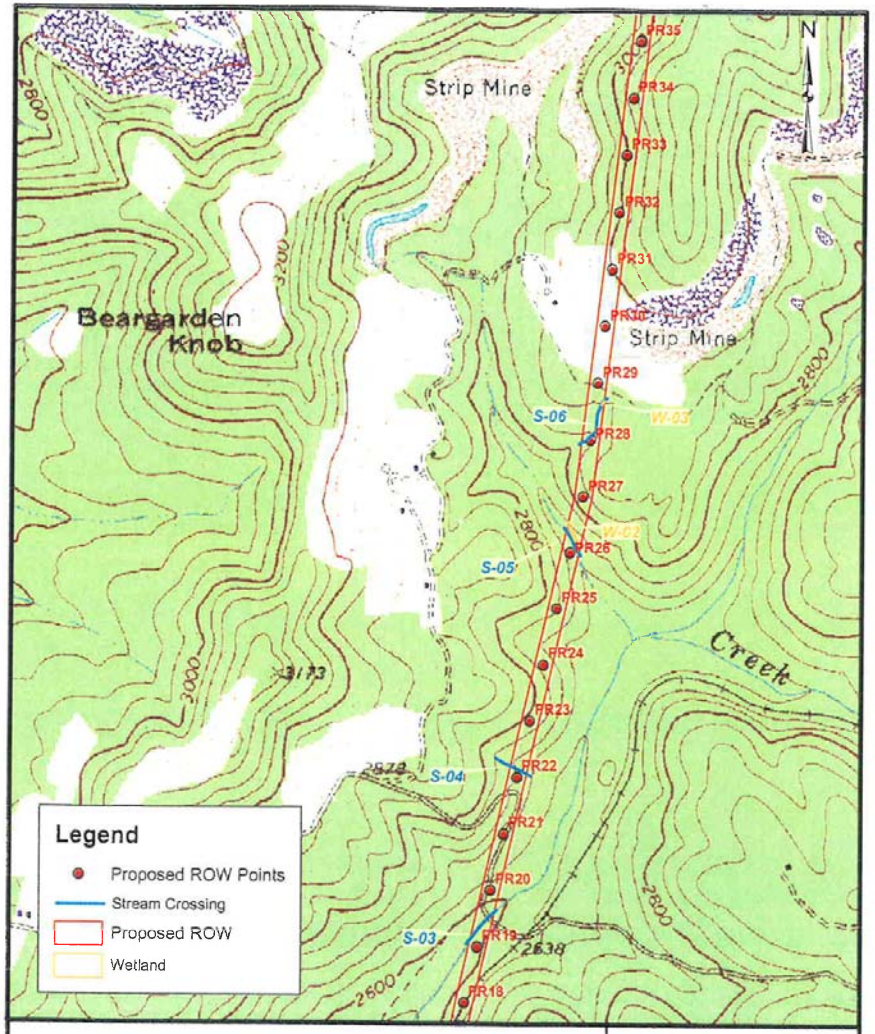

FIGURE 27
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

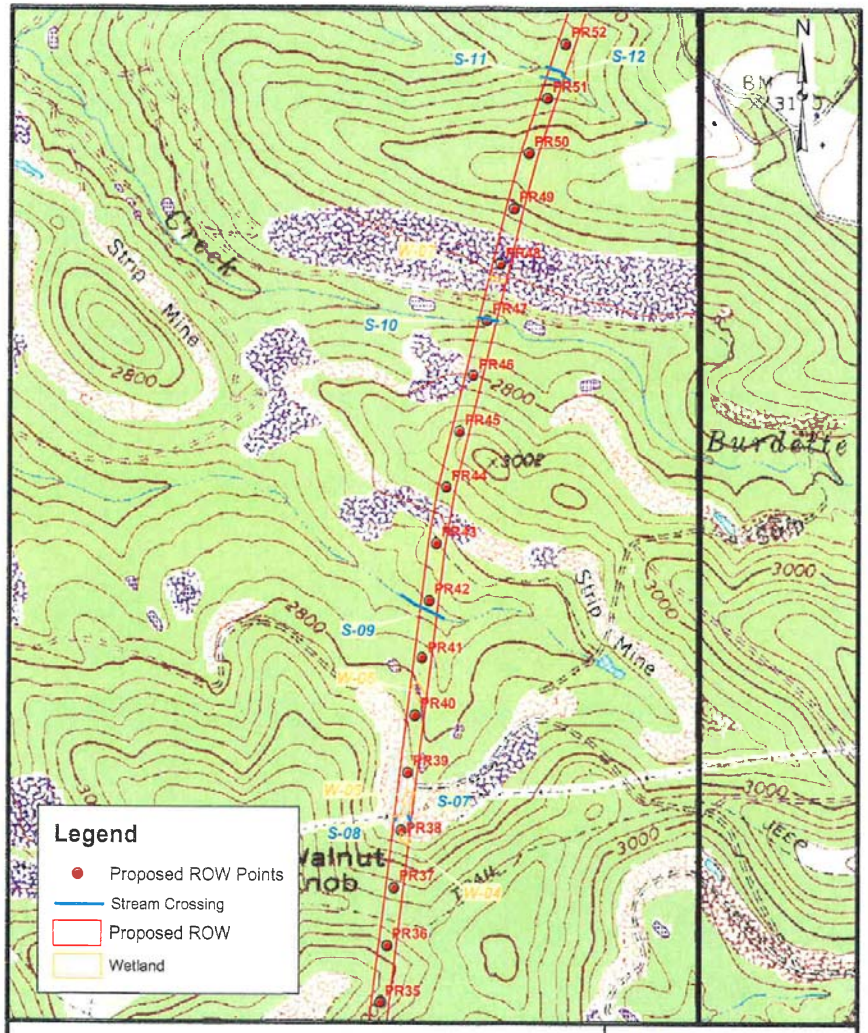

FIGURE 28
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

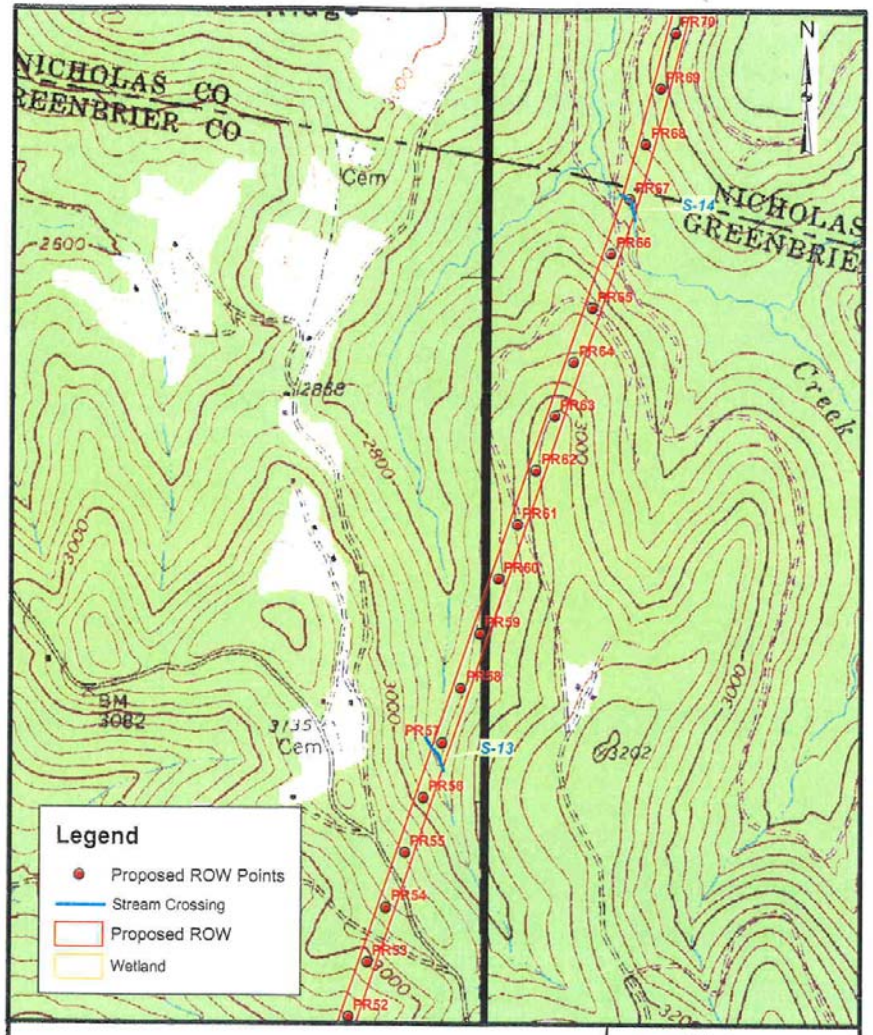

FIGURE 29
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

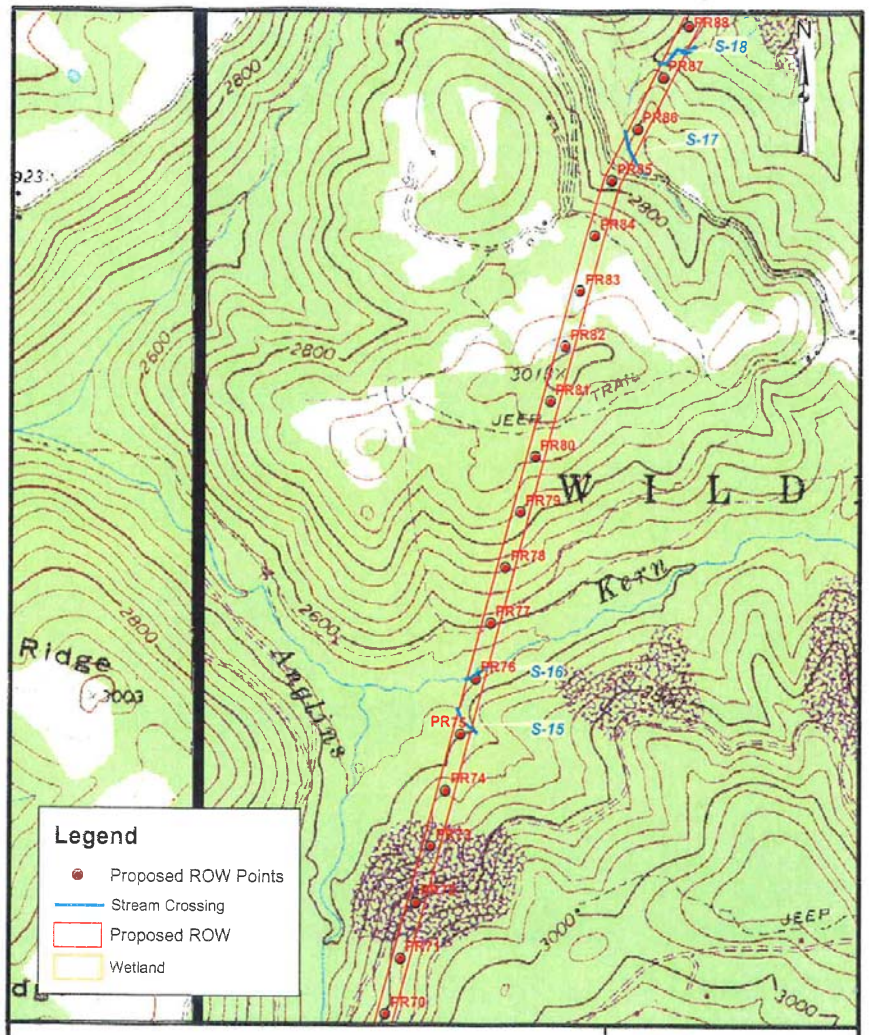

FIGURE 30
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

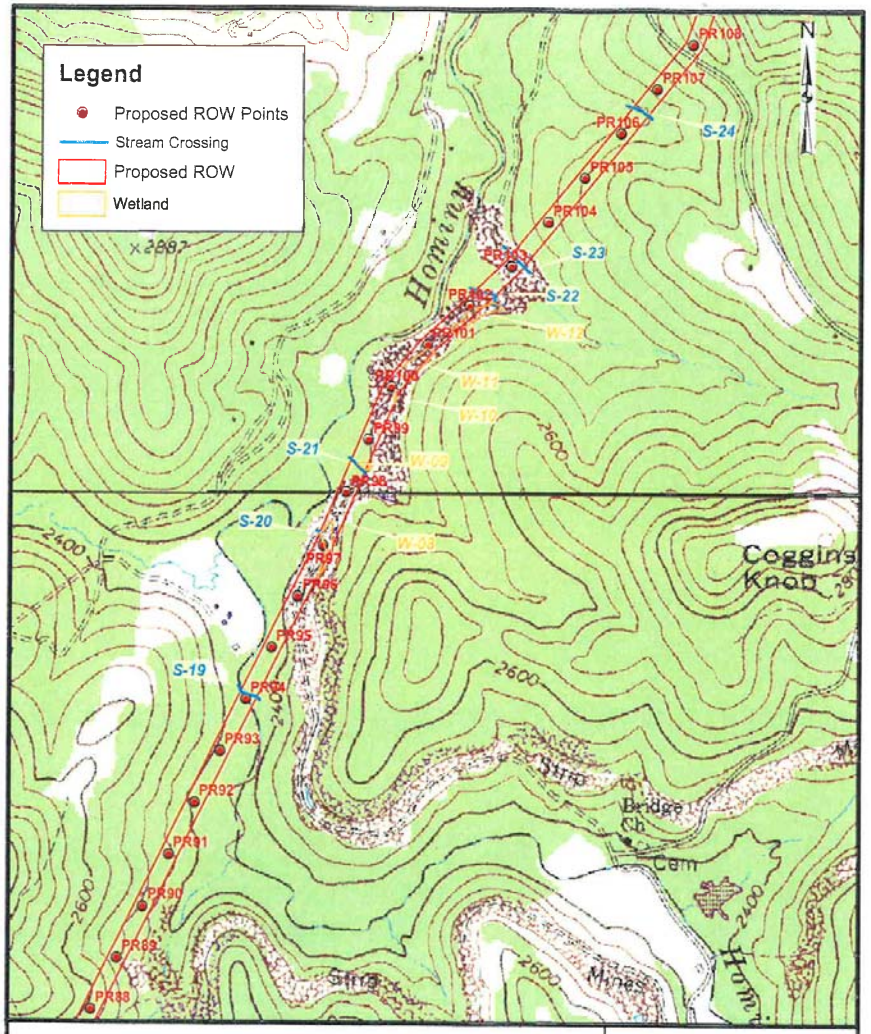

FIGURE 31
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

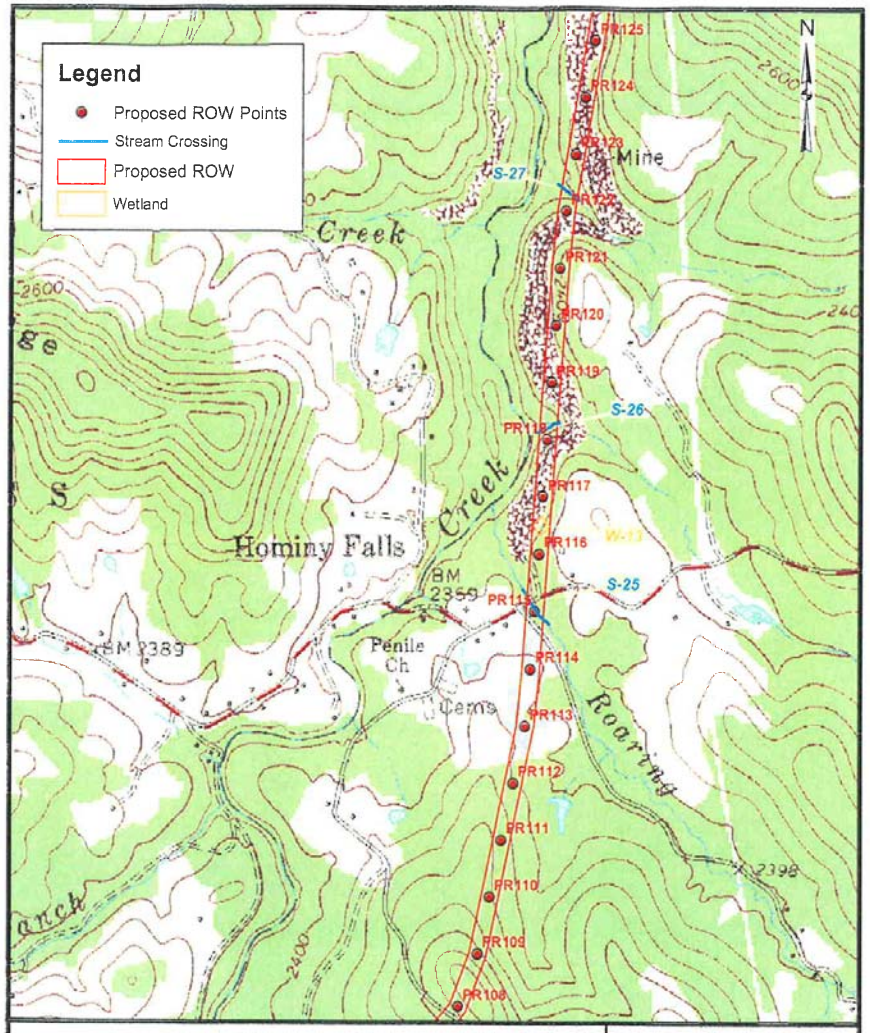

FIGURE 32
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

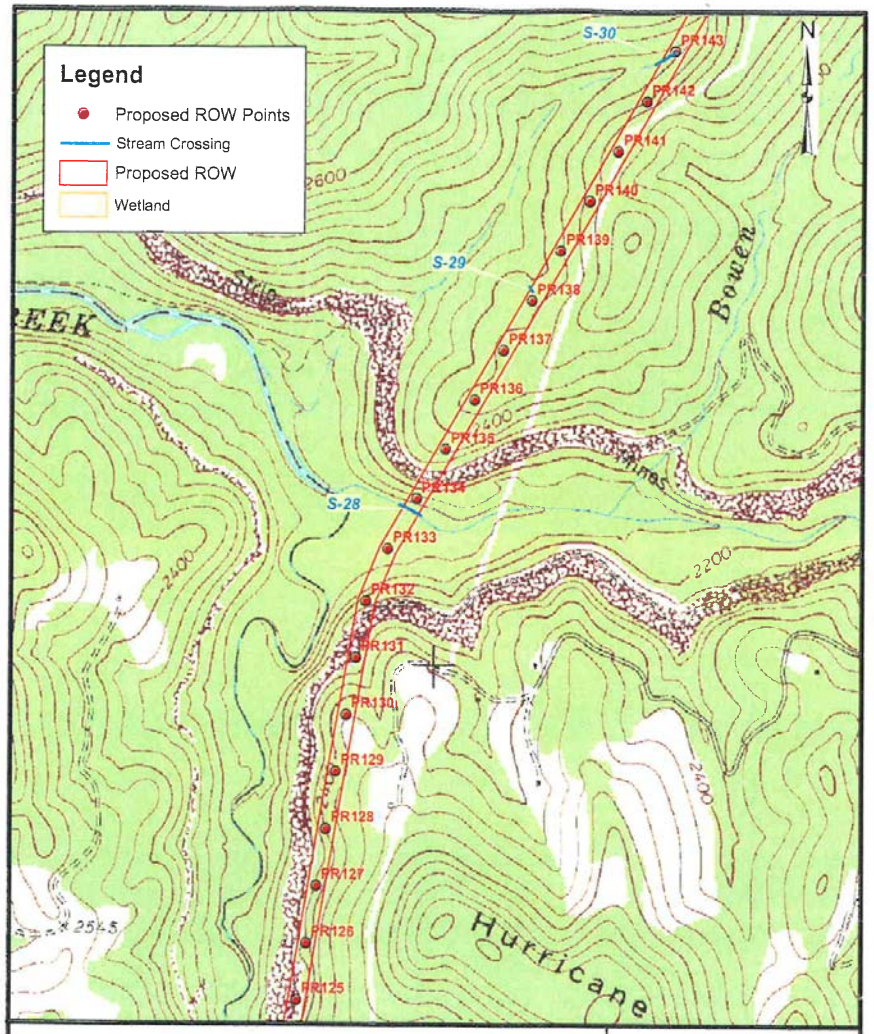

FIGURE 33
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS

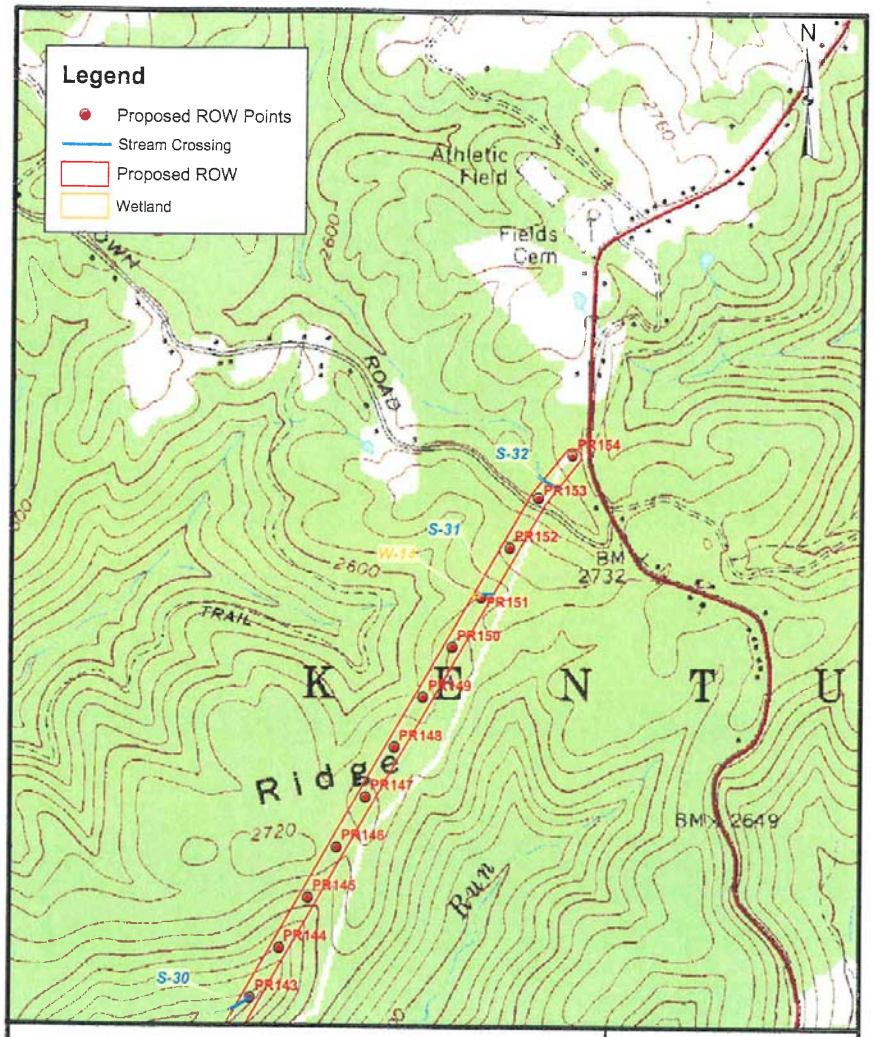

FIGURE 34
WETLAND AND STREAM CROSSINGS

Western Greenbrier Co-Generation LLC

0 500 1,000 2,000 3,000 Feet 1:12,000

URS