Appendix C

Wetlands Survey Report

WETLAND DELINEATION REPORT

FOR

PROPOSED COGENERATION PLANT

AT

RAINELLE

GREENBRIER COUNTY, WEST VIRGINIA

Prepared for:

Western Greenbrier Cogeneration, LLC
One John Rainelle Drive
P.O. Box 766
Rainelle, WV 25962

Prepared by:

POTOMAC-HUDSON ENGINEERING, INC.

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PHE Project No. 14.0001

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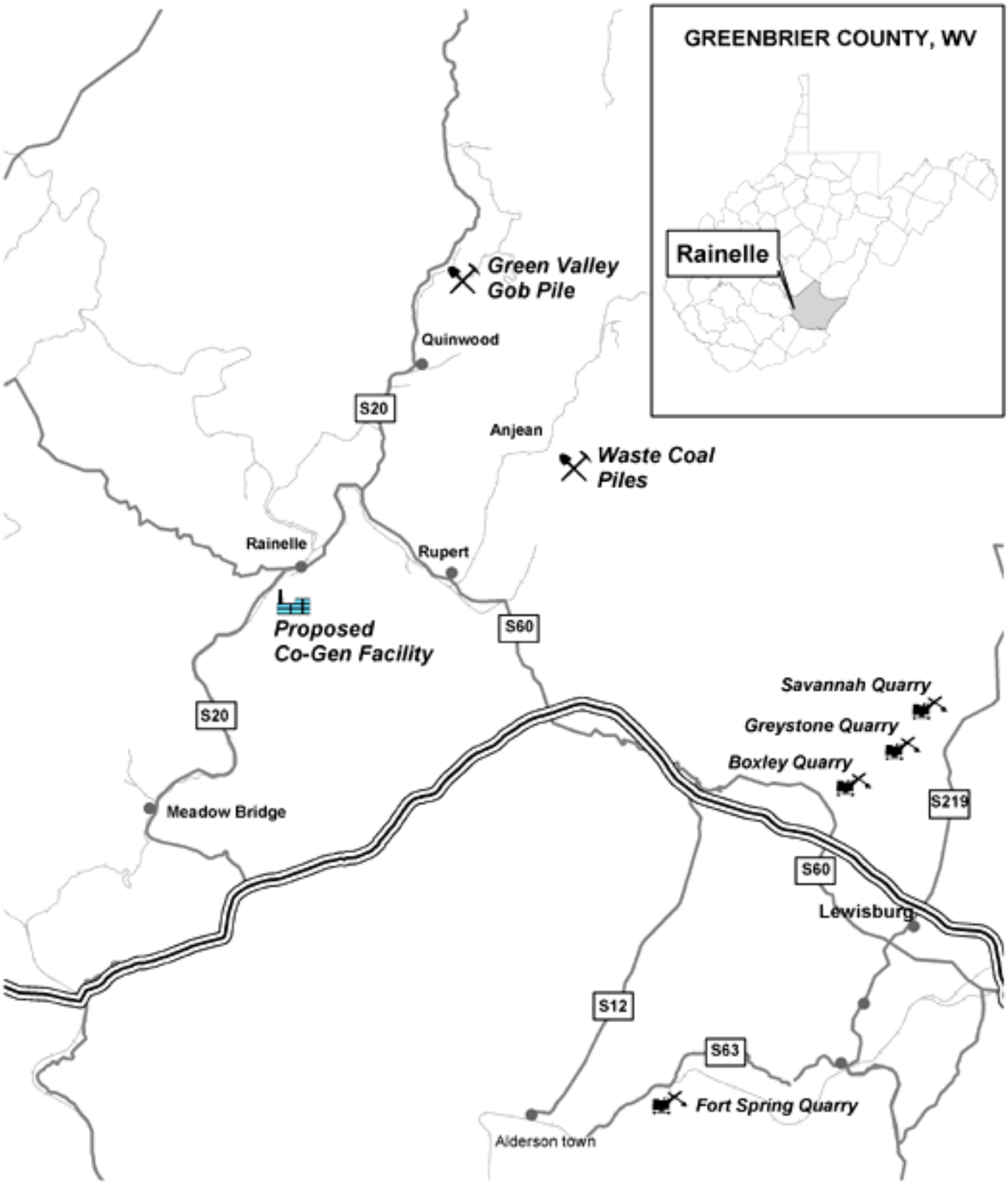

Figure 1.
Project Vicinity

Source: WVDOT, 2004

U.S. Department of Energy

National Energy Technology Lab

APPROXIMATE SCALE

1" = 4 miles

Date: June 6, 2005

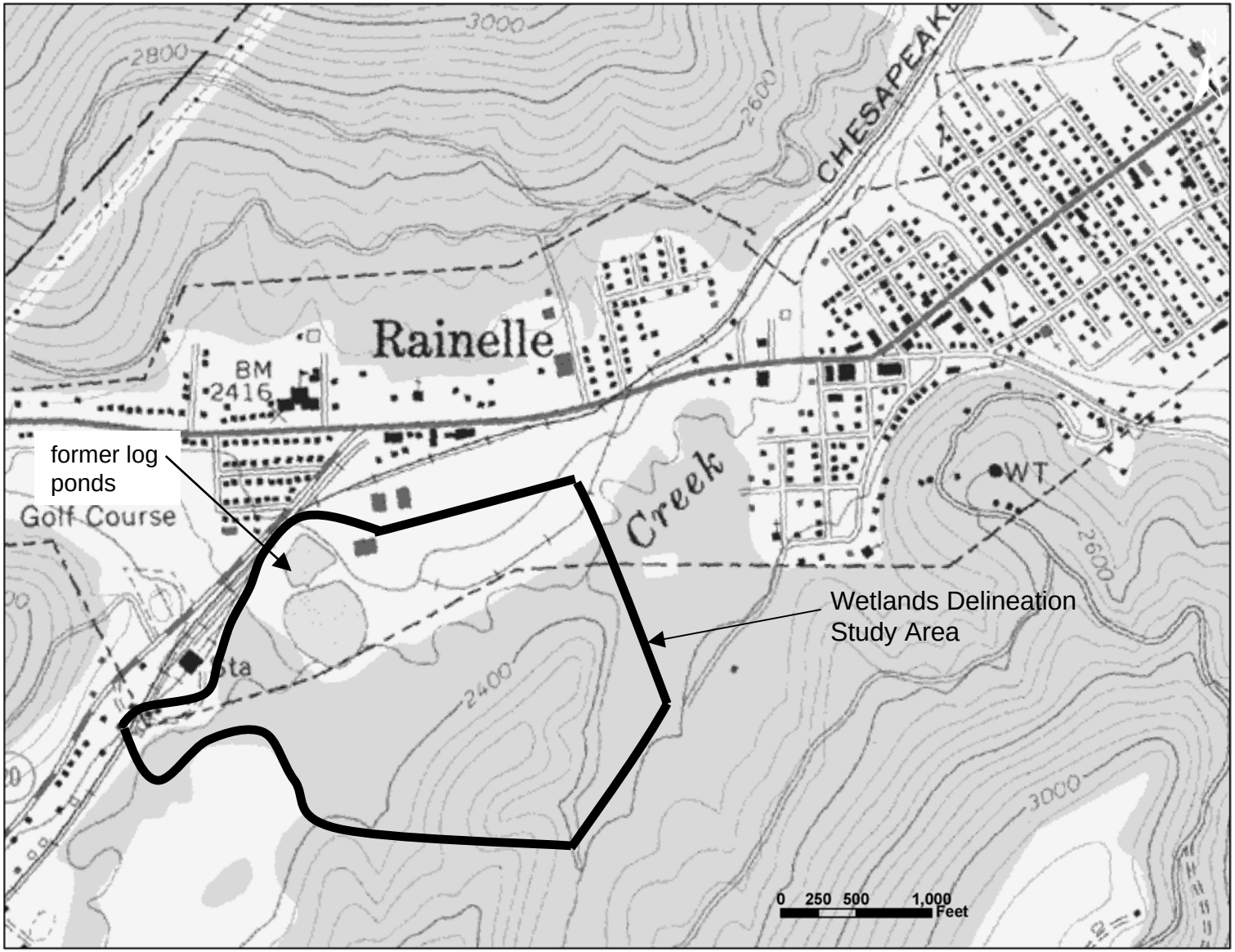

Figure 2.
Wetlands Delineation Study Area Map
Map Source: NE/4 Meadow Creek 15' Quadrangle, USGS, 1976

U.S. Department of Energy
National Energy Technology Lab

APPROXIMATE SCALE
1" = 1,000'

Date: June 6, 2005

Figure 3.
Aerial Photo of Wetlands Delineation Study Area
Map Source: USGS, 1996

U.S. Department of Energy
National Energy Technology Lab

APPROXIMATE SCALE
1" = 1,000'

Date: June 6, 2005

2.0 METHODOLOGY

2.1 Regulatory Background

The following is a definition of the term "wetlands" as provided in the *Corps of Engineers Wetlands Delineation Manual* (1987). Wetlands are:

> "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." (EPA, 40 CFR 230.03 and CE, 33 CFR 328.3).

Wetland determinations, using the *Corps of Engineers Wetlands Delineation Manual* (1987), are based on a three parameter approach. Under this methodology, an area must exhibit these three characteristics to be classified as a wetland:

(1) hydrophytic vegetation;
(2) hydric soils; and,
(3) wetland hydrology.

As defined in the *Manual*, hydrophytic vegetation is defined as macrophytic plant life growing in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. A list of wetland plants has been prepared to describe a species' affinity for wetland conditions. The appropriate list for West Virginia is the *National List of Plant Species that Occur in Wetlands: Northeast Region* (1988). Hydric soils are soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions within the major portion of the root zone. The National Technical Committee for Hydric Soils has developed criteria for hydric soil determination in addition to a list of hydric soil types. Wetlands hydrology is the permanent or periodic inundation or soil saturation for a significant period (7 days or more) during the growing season. Many factors influence the hydrology of an area including precipitation, topography, soil permeability and plant cover. The frequency and duration of inundation or soil saturation are the important factors in the determination of the existence of wetland hydrology.

2.2 Field Methodology

The wetland delineation occurred on April 19-23, September 13-16 and October 18-20, 2004. The purpose of the field delineation was to identify and delineate the limits of jurisdictional freshwater wetlands and waters of the U.S. within the limits of the site. The delineation was based upon the accepted methodology as outlined in the *Corps of Engineers Wetlands Delineation Manual (*1987), which uses the three parameter approach, i.e., vegetation, soils and hydrology, as discussed in the previous paragraphs.

The limits of on-site wetlands were determined and physically defined in the field by a series of consecutively numbered flag points. The flags established during the April 2004 investigation are blue, the flags established during the September and October 2004 investigation are pink/black striped flags. All flags marking the limits of the wetlands are single flags, while the flags marking the location of a recorded soil sample are double flags of the same color as those nearby wetland flags. A typical wetland flag was labeled with two letters and consecutive numbers, i.e., WA23 indicates "W" indicating wetland flag; "A" indicating the overall wetland line designation; and "23" to indicate the actual flag number. Soil points were labeled as SP1 through SP14 and their proximity to an individual wetland flag was noted on the Wetland Determination Data Sheets in Appendix B. A survey of those flag points, providing an accurate representation of the wetland limits with respect to the property boundaries, is provided on three maps in the back of this report along with a list of all of the wetland flags and soil points that were established.

2.2.1 Vegetation

Since vegetation serves as an indicator of existing environmental conditions, the methodology of the *Manual* directs the researcher to analyze the existing vegetation. This involves estimation of existing plant species composition by direct observation. Wetlands are usually characterized by the predominance of hydrophytic plant species. Conversely, upland areas would be dominated by more xerophytic species, or plants better adapted to drier soil conditions. A mesic zone, or the transition zone between wetland and upland habitat, is often comprised of a mixture of facultative wetland species, facultative, and facultative upland species.

With respect to vegetation, the *Manual* places great emphasis on the presence of hydrophytic species as indicators of wetland areas should these species be dominant within a plant community; the determination of whether or not a species is dominant is based upon its percentage of cover. Dominance, as defined herein, refers to the spatial extent of a species; commonly the most abundant species in each vegetation stratum that, when ranked in descending order of abundance and cumulatively totaled, exceeds 50 percent of the total dominance measure (i.e., aerial cover or basal area).

The USFWS has assigned a wetland indicator classification to plant species as follows:

Classification	Plant Affinity for Wetland Conditions Percent Occurrence In Wetlands
Obligate Wetland (OBL)	> 99
Facultative Wet (FACW)	67 - 99
Facultative (FAC)	33 - 66
Facultative Upland (FACU)	1 - 33
Obligate Upland (UPL)	< 1

A positive (+) or negative (-) symbol used in conjunction with one of the facultative indicator classes relates to a species preference to either the drier or the wetter end of its indicator class. The positive sign indicates preference to the wetter end of the category and a negative sign is a preference to the drier end. These wetlands indicator classifications were determined for species

found at the site and used in conjunction with their percentage of cover to determine whether a prevalence of wetland species were dominant in any of the vegetation communities occurring on-site.

2.2.2 Soils

During the field survey of the property, a hand auger was used by PHE personnel to bore soil samples to accurately document the extent of hydric soil conditions. The number of samples examined took into consideration the size and variability of the site, including the changes in the overall topography of the site. Soil samples were taken to a depth of approximately 24 inches and were examined for color, texture, and moisture content. Soils were then field checked to determine the Munsell Soil Color Chart designations. Hydric soils were identified by color in relation to the Munsell Chart and/or other field indicators. The Munsell designation indicates the soil color as removed from an auger or shovel hole. In general, soils are considered hydric if the chroma of the soil sample, at the top of the "B" horizon, is less than or equal to one, or less than or equal to two when mottling is present.

Although numerous soil samples were examined by PHE personnel during the delineation efforts, only some of these samples were recorded. The information regarding the soils, vegetation and hydrology at that particular sampling point is presented on the Wetland Determination Data Sheets provided in Appendix B of this report.

2.2.3 Hydrology

Wetland hydrology is often the least exact and most difficult parameter to establish in the field, due largely to the normal fluctuations in the relative abundance of water. Numerous factors influence the wetness of an area including: precipitation, topography, plant cover, and soil characteristics. Documenting the existence of wetlands hydrology on a site involves the detection of field indicators which provide direct or indirect evidence of inundation or soil saturation for seven days or longer during the growing season. Although these indicators are quickly assessed in the field, professional judgment must be used to decide whether these indicators demonstrate that the wetland hydrology criterion has been satisfied. Drift lines, water marks, sediment deposits, root staining, scour areas, buttressed trees and drainage patterns are some of the indicators which commonly identify wetland hydrology.

3.0 EXISTING CONDITIONS

3.1 Vegetation

The site consists of the following vegetative communities:

- Open field areas, with areas of trees and shrubs, located on the north side of Sewell Creek;

- Forested areas, both upland and wetland, present as small patches of woods along the north side of Sewell Creek and as larger, contiguous wooded areas on the south side of Sewell Creek; and
- Disturbed areas with only small amounts of vegetation located on the south side of Sewell Creek.

The open fields on the north side of Sewell Creek were the site of the former lumber mill and yard as identified during the archeological investigation (John Milner Associates, 2005) conducted for this project. Subsequent to the demolition of the lumber company's facilities in 1975, the field became vegetated. Also, as shown on the topographic map provided in Figure 2, two ponds were present in this area when the map was photorevised in 1976. These ponds are no longer present, but an isolated wetland identified by Flags WD1 through WD17 (Photo 11) was delineated within part of the former southern pond. This wetland is located in a topographically low area and is dominated by cattails. Another wetland dominated by cattails on the northern side of Sewell Creek is present near the western edge of the site (see Flags WA322 – WA333) on the enclosed maps).

Currently, the upland areas within the open fields on the north side of Sewell Creek consist of areas dominated by herbaceous species, including various grasses, wingstem, goldenrod, Indian hemp and milkweed. Some parts of these fields are mowed occasionally, while other areas are not and shrubs and young trees have become established. The species observed in the upland shrubby areas include sumac, black cherry, multiflora rose, and blackberry in addition to the herbaceous species listed above. In other parts of the field, such as near the eastern edge of the area delineated along Sewell Creek (Flags WA16-WA56, Photo 1) and in the western part of the site near the CSX Railroad yard (Flags WA253-WA295), there are small, wooded areas. Part of each of these wooded areas is upland and the remainder is wetland. The dominant species observed in the upland section of the eastern wooded area included American beech, ironwood, hawthorne, black cherry, jack-in-the-pulpit, mayapple and blackberry. The wetland area in this location was vegetated with swamp dogwood, willows, sedges, sensitive fern and some skunk cabbage. The wooded area near the CSX Railroad yard is vegetated with black cherry, flowering dogwood, black willow, mayapple, sensitive fern and skunk cabbage. Along the banks of Wolfpen Creek (WA227-WA240, Photo 7) near this wooded area, young specimens of these trees as well as poison ivy, goldenrod, blackberry and evening primrose were observed.

In addition to the above described features, three ditches are also present in the fields on the north side of Sewell Creek (Flags WA72-WA89, Photo 3, WA112-WA128 and Flags WB1-WB41). Another ditch is present on the north side of Sewell Creek, but it is located adjacent to the railroad tracks and flows to Wolfpen Creek (Flags WA197-WA225, Photos 8 & 9). These ditches are primarily vegetated with cattails, sedges, and soft rush. Some dogwood, arrowwood and multiflora rose shrubs are present along the banks in some areas of these ditches.

On the south side of Sewell Creek, wooded areas are present on most of the hillside shown as Sims Mountain on Figure 2 and in parts of the adjacent lower elevation areas. Most of the wooded area adjacent to the north side of the hillside is a wetland with several old channels leading to Sewell Creek (Photos 22, 23 & 24). The dominant species observed in the wooded wetland were red maple, pin oak, spice bush, swamp dogwood, cinnamon fern, jewelweed,

sensitive fern, and skunk cabbage. The wooded upland areas were dominated by red maple, American beech, red oak, hawthorne, ironwood, Christmas fern, witch hazel and Virginia creeper. Heading east along the base of the hillside, the site changes to a disturbed area associated with previous earth moving activities. Additionally, part of the hillside has been removed. The disturbed areas are dominated by barren areas as well as areas vegetated with wingstem, grasses, sedges, soft rush, goldenrod and areas dominated by shrubs and young trees including sumac, black cherry and black locust. On the eastern side of the hill, there is an unnamed tributary (Photos 14, 15, 18-20) that flows to Sewell Creek. This tributary runs through part of the disturbed area, but also through wooded areas of similar vegetation types as mentioned above. Within the disturbed area, the tributary's banks are vegetated with sedges and soft rush and some shrubs including elderberry and arrowwood. These two shrubs are also common in parts of the wetland boundary along the edge of Sewell Creek within the site.

A detailed list of vegetation observed on the site is provided in Table 1. The data sheets for the soil points recorded on the site also provide information on the vegetation present at those particular locations (Appendix B). Photographs of the site are provided in Appendix A.

Table 1: Vegetation Observed During the Field Investigations of the Wetland Delineation Site

TREES	
Red maple	*Acer rubrum*
Striped maple	*Acer pennsylvanicum*
Norway maple	*Acer platanoides*
Sweet birch	*Betula lenta*
Paper Birch	*Betula papyrifera*
Ironwood	*Carpinus caroliniana*
Shagbark hickory	*Carya ovata*
Mockernut hickory	*Carya tomentosa*
Flowering dogwood	*Cornus florida*
Hawthorn	*Crataegus sp.*
American beech	*Fagus grandifolia*
Green ash	*Fraxinus pennsylvanica*
Red cedar	*Juniperus virginiana*
Tulip tree	*Liriodendron tulipifera*
Apple	*Malus sp.*
Hop-hornbeam	*Ostrya virginiana*
Quaking aspen	*Populus tremuloides*
Black cherry	*Prunus serotina*
Pin cherry	*Prunus pensylvanicum*
Pear	*Pyrus sp.*
White oak	*Quercus alba*
Red oak	*Quercus rubra*
Pin oak	*Quercus palustris*
Swamp white oak	*Quercus bicolor*
Scarlet oak	*Quercus coccinea*
Black locust	*Robinia pseudoacacia*
Black willow	*Salix nigra*
Sassafras	*Sassafras albidum*
American linden	*Tilia americana*
SHRUBS	
Smooth Alder	*Alnus cf. serrulata*
Common barberry	*Berberis cf. vulgaris*
Swamp Dogwood	*Cornus amomum*
Autumn Elaeagnus	*Elaeagnus umbellata*
Witch hazel	*Hamamelis virginiana*
Spicebush	*Lindera benzoin*
Bush Honeysuckle	*Lonicera sp.*
Staghorn sumac	*Rhus typhina*
Raspberry	*Rubus spp.*
Multiflora rose	*Rosa multiflora*
Pussy Willow	*Salix discolor*

Table 1: Vegetation Observed During the Field Investigations (continued)

Elderberry	*Sambucus canadensis*
Maple-leaf viburnum	*Viburnum acerifolium*
Withe-rod	*Viburnum cassinoides*
Arrowwood	*Viburnum dentatum*
Grape	*Vitis sp.*
HERBACEOUS SPECIES	
Yarrow	*Achillea millefolium*
Wingstem	*Actinomeris alterniflora*
Ragweed	*Ambrosia artemisiifolia*
Wood anemone	*Anemone quinquefolia*
Jack in the pulpit	*Arisaema atrorubens*
Common mugwort	*Artemisia vulgaris*
Asters	*Aster spp.*
Beggar ticks	*Bidens cf. frondosa*
False nettle	*Boehmeria cylindrica*
Sedge	*Carex crinita*
Sedge	*Carex intumescens*
Blue-cohosh	*Caulophyllum thalictroides*
Oxeye Daisy	*Chrysanthemum leucanthemum*
Spring beauty	*Claytonia cf. caroliniana*
Virgin's bower	*Clematis virginiana*
Umbrella sedge	*Cyperus strigosus*
Orchard grass	*Dactylis glomerata*
Jimson Weed	*Datura stramonium*
Queen Anne's Lace	*Daucus carota*
Deertongue Grass	*Dichanthelium clandestinum*
Field Horsetail	*Equisetum arvense*
Trout Lily	*Erythronium umbilicatum*
Gill-over-the-Ground	*Glechoma hederacea*
Bluets	*Hedyotis caerulea*
Jewelweed	*Impatiens capensis*
False Rue Anemone	*Isopyrum biternatum*
Soft Rush	*Juncus effusus*
Everlasting pea	*Lathyrus latifolius*
Lily	*Lilium sp.*
Japanese honeysuckle	*Lonicera japonica*
Evening primrose	*Oenothera biennis*
Sensitive Fern	*Onoclea sensibilis*
Cinnamon Fern	*Osmunda cinnamomea*
Fall panicum	*Panicum dichotomiflorum*
Virginia creeper	*Partenocissus quinquefolia*
Pokeweed	*Phytolacca americana*
English plantain	*Plantago lanceolata*

Table 1: Vegetation Observed During the Field Investigations (continued)

May Apple	*Podophyllum peltatum*
Japanese knotweed	*Polygonum cuspidatum*
Pennsylvania smartweed	*Polygonum pensylvanicum*
Christmas Fern	*Polystichum acrostichoides*
Curly dock	*Rumex crispus*
Woolgrass sedge	*Scirpus cyperinus*
Golden Ragwort	*Senecio aureus*
Star Flowered Solomon's Seal	*Smilacena stellata*
Bristly Greenbrier	*Smilax hispida*
Roundleaf Greenbrier	*Smilax rotundifolia*
Goldenrod	*Solidago spp.*
Skunk Cabbage	*Symplocarpus foetidus*
Dandelion	*Taraxacum officinale*
Poison ivy	*Toxicodendron radicans*
Red clover	*Trifolium pratense*
Nodding Trillium	*Trillium cernum*
Purple trillium	*Trillium erectum*
Common Cattail	*Typha latifolia*
Common mullein	*Verbascum thapsus*
Violet	*Viola sp.*
Common Blue Violet	*Viola papilonacea*
Wooly Blue Violet	*Viola sororia*
Cocklebur	*Xanthium chinense*

Source: Potomac-Hudson Engineering, Inc., January 2005.

3.2 Soils

Soils within Greenbrier County, as is typical in most areas, in part reflect the lithology of the underlying rock formations and the respective physiographic provinces. Western Greenbrier County, which includes the project site, is part of the Appalachian Plateau and contains generally deep, easily eroded soils that formed in material weathered from shale. As described in the Phase I Archeological Report (John Milner Associates, 2005) produced for this project, there are three major soil associations are found within the vicinity of the site. These are:

- Atkins-Teas-Monogahela association along Sewell Creek and other lowlands in the area;
- Teas-Calvin-Gilpin-Litz association in the upland ridges east of Sewell Creek and south of U.S. Route 60; and
- Dekalb-Gilpin-Laidig-Cookport association in the upland areas west of State Route 20 and south of U.S. Route 60.

These general soil associations are further broken-down into more specific individual soil map units, as depicted in the *Soil Survey of Greenbrier County, West Virginia* (1972). According to the *Soil Survey*, there are four soil map units present on the site as indicated in Figure 4. The soil map units in order of abundance on the site are:

- Atkins silt loam (At);
- Calvin and Gilpin very stony soils, 25 to 40 percent slopes (CgE);
- Monongahela silt loam, 2 to 8 percent slopes (MgB); and
- Pope fine sandy loam (Po).

The Atkins silt loam soil type is classified as a hydric soil (i.e., that soil typically found in wetlands) based on information obtained from the U.S. Department of Agriculture, Natural Resources Conservation Service (12/27/04). The following paragraphs are descriptions of the soil types found on site as excerpted from the *Soil Survey of Greenbrier County* (1972).

Atkins silt loam (At) – The Atkins series consists of deep, poorly drained, nearly level soils. These soils are on bottom lands, generally near the base of the hills, but in certain places they occupy the entire bottom. They are commonly along streams that drain the upland areas. These soils formed in alluvium derived from upland soils that are underlain by acid sandstone and shale. They are subject to flooding, as slopes typically range from 0 to 3 percent. Included in mapping with this soil type were small areas of very poorly drained soils and small areas of soils that have a surface layer of fine sandy loam. Also included were small, slightly more sloping areas on hillsides.

In a typical profile, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil extends to a depth of about 36 inches. The upper part is gray heavy silt loam, and the lower part is gray light silty clay loam. Strong-brown mottling begins at a depth of about 8 inches. Below the subsoil is gray silty clay loam that contains thin lenses of sandy and silty material. This layer extends to a depth of 50 inches or more.

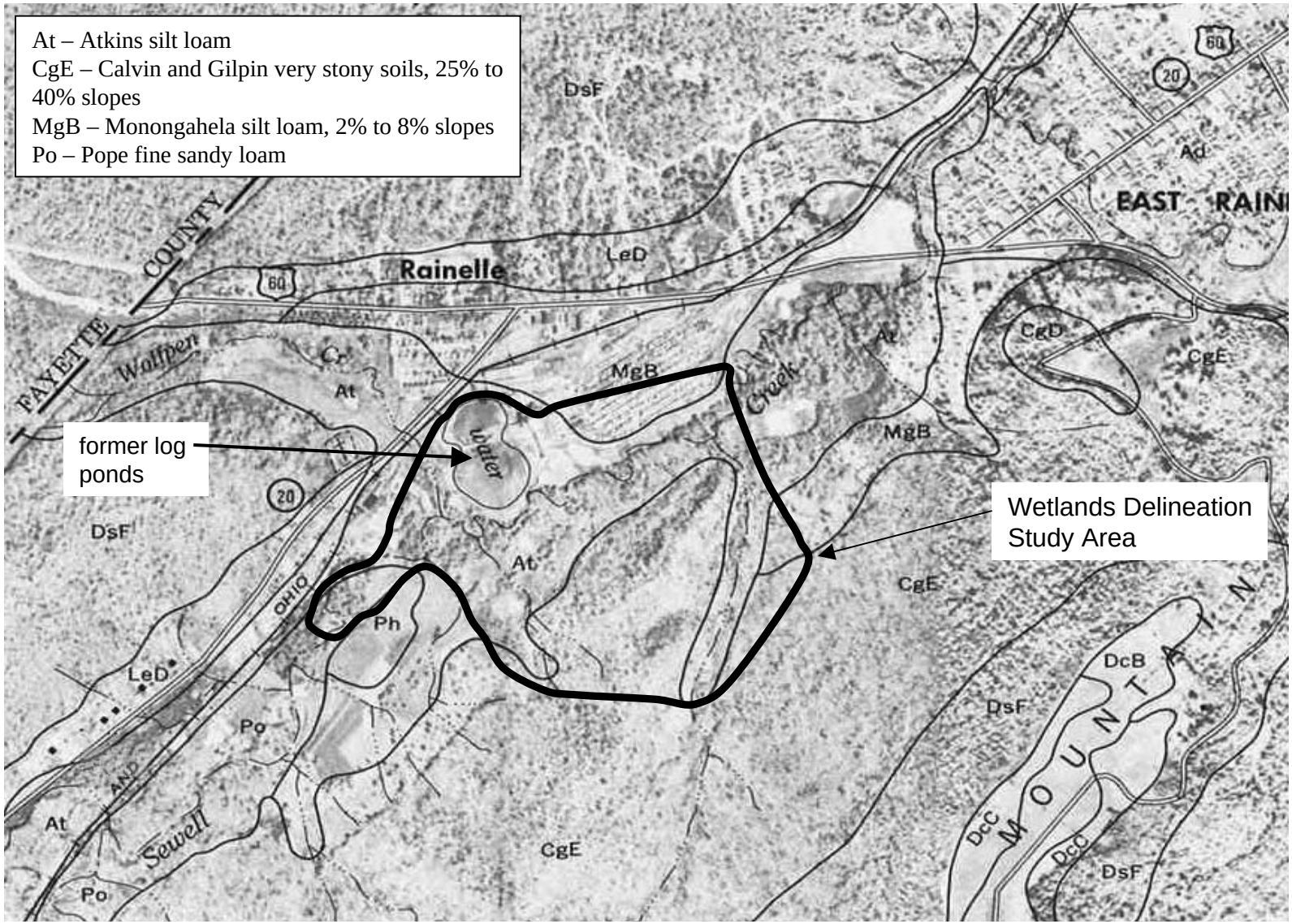

Figure 4.
Soil Survey of Greenbrier County, West Virginia
Source: USDA SCS, 1972

U.S. Department of Energy
National Energy Technology Lab

SCALE
(Not to Scale)

Date: June 6, 2005

Permeability is moderately slow to slow, the available moisture capacity is moderate, and fertility is low to moderate. The water table is high.

The use of these soils for most purposes is severely to very severely limited by the high water table and the hazard of flooding. Surface drainage is generally poor. The subsoil drains moderately well into tile and into open ditches if the permanent water table is not too high. If adequately drained, this soil is suitable for crops, such as hay or pasture crops mixed with water-tolerant grasses or legumes.

Calvin and Gilpin very stony soils, 25 to 40 percent slopes – Any given area of this undifferentiated group may consist of one or the other of these soils, or, more commonly, of both. Also included in the mapping areas of this soil type are small areas of Dekalb and Litz soils and small, severely eroded areas.

The Calvin series consists of moderately deep, well-drained, reddish-brown stony soils. These soils are on dissected uplands common in the west-central part of the county. They formed in material weathered from reddish, acidic siltstone and shale.

The Gilpin series, which is commonly found with the Calvin series, consists of moderately deep, well-drained, strongly sloping to very steep soils. These soils are also on dissected uplands in the western portion of the county and formed in residuum weathered from gray acid siltstone and shale and some interbedded sandstone.

In a typical profile of the Calvin series in a wooded area, a thin mat of dark-colored organic matter covers the surface. The surface layer, below this mat, is dark-reddish brown silt loam in the uppermost 2 inches and reddish-brown silt loam in the next 5 inches. The subsoil extends to a depth of about 23 inches. The upper part is dark reddish-brown heavy silt loam, and the lower part is dark reddish-brown very channery silt loam. Siltstone fragments make up 60 to 70 percent of the lower part. Red siltstone bedrock begins at a depth of 23 inches.

In a typical profile of the Gilpin series in a wooded area, a thin mat of organic matter covers the surface. The surface layer, below this mat, is very dark grayish-brown silt loam in the uppermost 2 inches and brown silt loam in the next 6 inches. The subsoil extends to a depth of 22 inches. The upper part is yellowish-brown, friable, shaly silty clay loam, and the lower part is yellowish-brown, shaly heavy silt loam. Shale fragments are common in the subsoil and increase in volume with increasing depth. Below the subsoil is yellowish-brown very shaly silt loam that is about 75 percent shale fragments. Gray shale bedrock begins at a depth of 28 inches.

Both the Calvin and Gilpin series have moderate permeability. The available moisture capacity and fertility of both series are low to moderate. Generally, these soils are better suited to trees than to other uses. They are difficult to manage because of the large stones.

Monongahela silt loam, 2 to 8 percent slopes (MgB) – The Monongahela series consists of deep, moderately well drained, gently sloping to strongly sloping, silty soils. These soils formed in old alluvium washed from uplands that are underlain principally by acid sandstone and shale.

In a typical profile, the surface layer is dark grayish-brown and pale-brown silt loam about 10 inches thick. The subsoil extends to a depth of 57 inches. The upper part is light olive-brown, firm silty clay loam. The middle part is yellowish-brown, firm heavy silt loam. The lower part if yellowish brown, very firm and compact silt loam that is mottled with light gray and yellowish red. The very firm layer begins at a depth of about 27 inches. Below the subsoil is light yellowish-brown, yellowish-red, and gray, firm light silty clay loam that contains some sandstone fragments. This layer extends to a depth of 65 inches or more.

Permeability is moderate above the fragipan, but slow within it. The available moisture capacity is moderate. The water table is high in winter and spring and seepy spots are common. The use of these soils is limited mainly be the seasonal high water table and the slowly permeable fragipan. The usefulness of these soils for building sites is also limited by the high water table.

Pope fine sandy loam (Po) – The Pope series consist of deep, well-drained, moderately coarse textured soils. These soils are on bottom lands, generally near streambanks. They formed in recent alluvium washed from upland areas underlain by gray, acid sandstone and shale. These soils are flooded at intervals ranging from once a year to once in 3 or 4 years; the length varies by location.

In a typical profile of the series, the surface layer is dark grayish-brown fine sandy loam about 10 inches thick. The subsoil extends to a depth of 40 inches. The upper part is dark yellowish-brown, friable fine sandy loam, and the lower part is dark yellowish-brown, very friable sandy loam. Below the subsoil is loose, stratified silty, sandy, and gravelly material to a depth of 60 inches or more.

Permeability is moderately rapid and the available moisture capacity is moderate to moderately low. The use of these soils is limited by flooding and by their tendency to be droughty. It has been identified that the streambanks may need stabilization in some areas of the Po map unit.

During the wetland delineation, soil information was recorded at 14 different locations within the 35-acre site. These soil points are marked on site by double flags of the same color of the wetland flagging used in that area. The information recorded at each of these locations is provided on the Wetland Determination Data Sheets in Appendix B. Observations of the soils encountered at these data points include that the soils recorded within wetlands consisted primarily of gray to black soils, some with mottling. All of the wetland soils recorded were primarily clay, although the amount of clay varied with location, i.e., some of the samples were entirely clay, others were clay loam or silty clay loam soils. Although many of the upland data points that were recorded consisted of clay soils, many of the upland soils observed throughout the site were primarily sandy loam soils of varying colors. Gravel and pebbles were also observed in some of the upland areas.

3.3 Hydrology

Sewell Creek is the primary waterway within the site. Sewell Creek runs roughly in a southwest to northeast direction through the limits of the site and continues a meandering course until its

confluence with the Meadow River, located approximately one mile to the northeast of the site. The Meadow River flows to the Gauley River which then flows to the New River. At the confluence of the Gauley River and New River, the Gauley River watershed drains into the head of the Great Kanawha River, and consequently, is captured by the Kanawha-New River Basin. The Kanawha-New River Basin comprises most of the southern half of West Virginia and parts of Virginia and North Carolina. Within the vicinity of the site, Wolfpen Creek and Little Sewell Creek are the primary tributaries to Sewell Creek. Wolfpen Creek has its confluence with Sewell Creek in the northwestern part of the site and the confluence of Little Sewell Creek with Sewell Creek is located about one half mile northeast of the site.

The jurisdictional waters and wetlands delineated for this project were Sewell Creek, Wolfpen Creek, unnamed tributaries to Sewell Creek, and low lying areas located adjacent to both the north and south side of Sewell Creek. Indicators of wetland hydrology in the areas delineated included: defined channels, standing water, saturated soils, and/or mottling as observed in the soil profiles (see Data Sheets in Appendix B).

4.0 RESULTS

Most of the wetland flags established by PHE within the site are associated with delineating the boundaries of Sewell Creek (Photos 4, 5, 6, 10, 12 & 21). Other areas delineated on the north side of Sewell Creek include, beginning on the western edge of the site and heading east:

(1) a small, emergent wetland area vegetated primarily with cattails located adjacent to Sewell Creek (Flags WA322-WA333; 0.052 acres);
(2) a short ditch adjacent to the dirt roadway within the CSX Railroad property (Flags WA308-WA318, Photo 13; 0.016 acres);
(3) a section of wooded wetland near the CSX Railroad property and west of Wolfpen Creek (Flags WA253-WA295; 0.479 acres);
(4) Wolfpen Creek from the railroad crossing south to its confluence with Sewell Creek (Flags WA184-WA197 & WA 225-WA240, Photo 7; 0.440 acres);
(5) a ditch that runs parallel to the railroad tracks and enters Wolfpen Creek near the railroad crossing (Flags WA197-WA225, Photos 8 & 9; 0.109 acres);
(6) a two part ditch, connected via a culvert, within the open field part of the site (Flags WB1-WB41; 0.204 acres);
(7) an isolated, emergent wetland vegetated with cattails and sedges located within the open field part of the site (Flags WD1-WD17, Photo 11; 0.232 acres);
(8) topographically low areas adjacent to a ditch within the open field and adjacent to Sewell Creek (Flags WA112-WA143; 2.362 acres);
(9) a ditch beginning within the open field that widens into a back channel area as it approaches Sewell Creek (Flags WA69-WA100, Photos 2 & 3; 0.389 acres); and
(10) a narrow wetland that exists within a portion of the wooded area and the adjacent open field (Flags WA16-WA56, Photo 1; 0.709 acres).

The areas delineated on the south side of Sewell Creek, include many back channels that are separated from Sewell Creek by small upland areas (Photos 22, 23, & 24). Some of these back channels are also separated from a larger wetland system that is located adjacent to the bottom of

the hillside on the southern edge of the site. This larger, wetland system is a wooded area where standing water was observed in some locations and a small, unnamed tributary (Flags WE33-WE49 & WF1-WF24) provides runoff from the adjacent hillside. Most of these features occur in the western half of the site on the south side of Sewell Creek.

Most of the eastern half of the site on the south side of Sewell Creek has been disturbed from previous earth moving activities. In the eastern half of this part of the site, Sewell Creek was the primary feature delineated. However, an unnamed tributary is located near the eastern edge of the site that has several smaller tributaries of its own. Photos 14 through 20 provide different views of this tributary and its smaller tributaries. As shown in the photos, some of the areas along this feature are primarily open water, while other areas are wooded wetlands or narrow drainage features without defined channels through wooded wetlands

The wetland boundaries presented on the maps provided in the back of this report (Figures 5 through 8) represent only those wetlands observed within the limits of the site. Many of the features delineated by PHE continue beyond the limits of the site, such as Sewell Creek, Wolfpen Creek, the unnamed tributary on the southern side of Sewell Creek and several of the wetland boundaries delineated on the south side of Sewell Creek. The following table provides a list of all wetland boundaries established within the site during the April, September and October 2004 site visits.

The information provided in Table 2 corresponds to the accompanying Wetlands Delineation Maps, Figures 5 through 8, prepared by Potomac-Hudson Engineering, Inc. The wetland flags/stakes established by PHE were located by Marathon Technical Services Inc. using a GPS (Global Positioning System) unit to obtain sub-meter accuracy. The GPS data was then incorporated into an AutoCAD drawing provided by Potesta Associates, Inc. depicting the topographic features, roadways, buildings, etc. to produce Figures 5 through 8. A CD with the AutoCAD files of the Wetlands Delineation Maps is also provided with this report. Due to the size of the site and the need to see the individual wetlands points clearly, the maps have been divided into three figures (Figures 6 through 8), while an overall view of the wetlands delineation is provided in Figure 5, located in the back of this report:

- Figure 5. Wetlands Delineation – Overview: depicts an overall view of the project site and the wetlands delineation at a scale of 1” = 120’ (Sheet 1 of 4).
- Figure 6. Wetlands Delineation – West Area: depicts the western section of the wetlands survey area at a scale of 1” = 60’.
- Figure 7: Wetlands Delineation – Middle Area: depicts the middle section of the wetlands survey area at a scale of 1” = 60’.
- Figure 8: Wetlands Delineation – East Area: depicts the eastern section of the wetlands survey area at a scale of 1” = 60’.

Table 2: Wetland Flag Information

Flag/Stake Numbers	Water/Wetland Type & Location	Notes
WA1 - WA337	Delineates northern edge of Sewell Creek, a tributary in a wooded area, three ditches & eastern edge of Wolfpen Creek	WA1-WA308 (blue) WA309-WA337 (pink/black) Photos 1-9 & 12, 13, 21
WB1 – WB41- WB1	Delineates a ditch in field on northern side of Sewell Creek. Connected to WA line via a culvert.	all blue flags
WC1 – WC69, WC69a – WC69e, WC70-WC118	Begins at edge of disturbed area on south side of Sewell Creek, delineates tributary, southern edge of Sewell Creek & western edge of a tributary on the eastern edge of the site.	all blue flags Photos 10 & 18
WD1 – WD17 - WD1	Isolated, emergent wetland located within field on north side of Sewell Creek	Isolated wetland; all blue flags Photo 11
WE1 - WE49	Southern edge of wooded wetland at base of hill on south side of Sewell Creek & a tributary	all pink/black flags
WF1 – WF69 WF69a-WF87 WF87a, WF87b WF88 – WF130	Begins at top of tributary within site boundaries across from WE49, continues through wooded area, delineates a tributary, then part of southern edge of Sewell Creek, then back into the woods. Ends at tree line on western edge of site.	all pink/black flags Photo 24
WG1 - WG48 –WG1	Delineates a tributary and part of the southern edge of Sewell Creek, delineating an upland pocket	all pink/black flags
WH1 – WH46 - WH1	Delineates two tributaries in wooded area & part of southern edge of Sewell Creek to create an upland pocket	all pink/black flags
WJ1 – WJ31	Begins on edge of tree line on western edge of site on south side of Sewell Creek.	all pink/black flags Photo 23
WK1 – WK8	Begins & ends on edge of tree line on western edge of site on south side of Sewell Creek	all pink/black flags Photos 22 & 23
WL1 – WL14	Begins & ends along western edge of site on south side of Sewell Creek	all pink/black flags Photo 22
WO1 – WO35 – WO1	Delineates tributaries and part of southern side of Sewell Creek near western edge of site. Isolates an upland pocket	all pink/black flags

Table 2: Wetland Flag Information (continued)

WP1 – WP12, WP12a, WP13 – WP45 – WP1	Delineates south side of Sewell Creek and tributaries in wooded area; delineates isolated upland pocket	all pink/black flags
WR1 – WR42 – WR1	Delineates oxbow of Sewell Creek in center of site	all pink/black flags
WV1 – WV38 – WV1	Delineates an isolated, upland pocket within wooded area at base of hill on south side of Sewell Creek	all pink/black flags
WX1 – WX32	Delineates tributary on eastern edge of site on south side of Sewell Creek	all pink/black flags Photos 18 & 19
WY1 – WY92	Delineates western side of tributary located on eastern edge of site on south side of Sewell Creek	all pink/black flags Photos 14-17 & 20
WZ1 – WZ55	Delineates eastern side of tributary located on eastern edge of site on south side of Sewell Creek	all pink/black flags Photos 14, 15 & 20

NOTES:

- The following flags are missing from the map and may or may not have been marked in the field: WA270, WA274, WY26. Their absence from the map does not have a significant impact on the wetland boundaries represented.
- The flags established to mark the wetland boundaries were typically tied to vegetation. However, in instances where no sturdy vegetation was present, the wetland flags were tied to wooden stakes instead.

Source: Potomac-Hudson Engineering, Inc., January 2005.

During the field investigation in April 2004, PHE requested that a representative from the USACE visit the site to conduct a preliminary review of the wetlands delineated by PHE that week. Ms. Sarah Workman from the USACE viewed some of the wetland boundaries and agreed with the delineation of the areas observed. Ms. Workman also identified one wetland delineated by PHE (Flags WD1- WD17) as an isolated wetland feature. Isolated features are those not connected to a surface water tributary system and based on a Supreme Court decision in 2001, are no longer subject to Section 404 (see Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC). The boundaries of this feature remain on the maps accompanying this report so that the USACE office may review the site in its entirety and make a determination as to whether the wetland delineated by Flags WD1-WD17 will be considered a jurisdictional feature or not due to its proximity to other wetlands. Also, the location of this isolated wetland may be pertinent if the guidelines for regulating wetlands change in the future prior to the completion of the proposed project.

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APPENDIX A

WETLAND PHOTOGRAPHS

Photo 2: From near Flag WA-70, looking north.

Photo 1: From near Flag WA-34, looking east.

Photo 4: Looking downstream (east) at Sewell Creek from near Flag WA-164.

Photo 3: From near Flag WA-72, looking north at ditch.

Photo 6: Looking downstream (southeast) at Sewell Creek from near Flag WA-182.

Photo 5: Looking downstream (southwest) at Sewell Creek at Flag WA-179.

Photo 8: Looking downstream (southwest) at ditch parallel to railroad tracks, from near Flag WA-211.

Photo 7: Looking upstream (northwest) at Wolfpen Creek from its confluence with Sewell Creek, near Flag WA-184.

Photo 10: Looking upstream (northwest) at Flags WC-69 & WC-70 along Sewell Creek.

Photo 9: Looking upstream (northeast) at Flags WA-210, 211 & 212 in ditch parallel to railroad tracks.

Photo 12: Looking upstream (southeast) from near Flag A307.

Photo 11: Looking west from near Flag WD17 toward Flag WD14.

Photo 14: Looking north along tributary near Flag WZ18.

Photo 13: Looking downstream (southwest) at ditch delineated by Flags A308 through A318.

Photo 16: Looking east at channel in wetland near Flag WY52.

Photo 15: Looking south along tributary near Flag WZ18.

Photo 18: Looking south at tributary from near Flag WX31.

Photo 17: Looking south from near Flag WY91 toward Flag WY92.

Photo 20: Looking upstream (south) at unnamed tributary from near Flag WZ2.

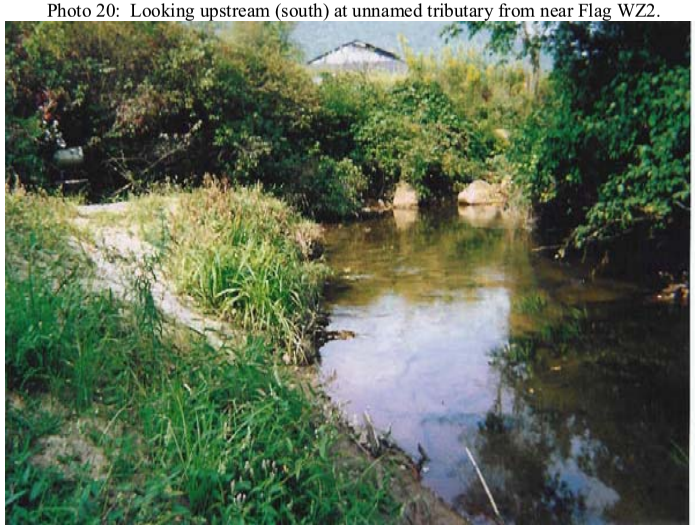


Photo 19: Looking downstream (north) at unnamed tributary at Flags WC117 (blue on left side) and WX1 (pink & black on right side.)

Photo 23: Looking northeast at Flags WJ31 and WK1 at edge of field on south side of Sewell Creek.

Photo 21: Looking north at Sewell Creek near Flag WA 322.

Photo 22: Looking northeast at Flag WK8, near edge of field on south side of Sewell Creek.

Photo 25: View of overall site on north side of Sewell Creek, looking southeast.

Photo 24: Typical view of wetland delineated by WF Flags.

Photo 26: View of site, looking northwest from hillside on south side of Sewell Creek.

APPENDIX B

WETLAND DETERMINATION DATA SHEETS

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/CROSSAN Date: 4/20/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP1 near
Municipality: RAINELLE Block: Lots: Flag A142

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Salix nigra	FACW+	11. Typha latifolia	OBL
2.		12. Panicum clandestinum	FAC+
3.		13. Scirpus cyperinus	FACW+
4.		14. Viola sororia	FAC
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Rosa multiflora	FACU	16.	
7. Cornus amomum	FACW	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 85%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Pope fine sandy loam
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-13"	10YR 2/1			clay loam
13-14"	10YR 5/3	10YR 5/6	10%	sandy clay loam
14-15"	2.5Y 3/1			loam
15-24"	10YR 4/2	7.5YR 4/6	10%	clay loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes X No
Comments: Soil is of low chroma values with mottling

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes No X Depth to saturated soil:
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes X No
Comments:

Wetland X Non Wetland

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/CROSSAN Date: 4/21/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP2 near
Municipality: RAINELLE Block: Lots: Flag WC60

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Prunus serotina	FACU	11. Podophyllum peltatum	FACU
2.		12. Senecio aureus	FACW
3.		13. Erythronium umbilicatum	FAC
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Lindera benzoin	FACW-	16. Vitis sp	ID
7. Cornus amomum	FACW	17.	
8. Rosa multiflora	FACU	18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 50%
Is the hydrophytic vegetation criterion met? Yes No X
Comments: At least 50% of dominant species are FAC or wetter

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-7"	10YR 3/1			clay loam
7-24"	10YR 3/4			clay loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes No X Depth to saturated soil:
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes No X
Comments:

Wetland Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/CAREY Date: 4/22/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP 3 near
Municipality: RAINELLE Block: Lots: FLAG WA 257

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Carpinus caroliniana	FAC	11. Symplocarpus foetidus	OBL
2.		12. Typha latifolia	OBL
3.		13. Erythronium umbilicatum	FAC
4.		14. Senecio aureus	FACW
5.		15. Viola papilionacea	FAC
		Smilacina stellata	FACW
Saplings/Shrubs		**Woody Vines**	
6. Cornus amomum	FACW	16.	
7. Rosa multiflora	FACU	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 90%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dominant species are FAC or greater.

Series/phase as mapped by SCS Pope fine sandy loam
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-10"	2.5Y 3/1	7.5YR 4/4	5%	clay loam
10-20"	2.5 4/2	7.5YR 4/4	15%	clay loam
20-24"	2.5Y 5/2	7.5YR 4/4	20%	clay
	AND	2.5YR 4/1	15%	

Other hydric soil indicators:
Is the hydric soil criterion met? Yes X No
Comments: Soil is of low chroma values with mottling

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes X No Depth to saturated soil: 3-4"
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes X No
Comments:

Wetland X Non Wetland

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/CAREY Date: 4/22/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP 4 near
Municipality: RAINELLE Block: Lots: Flag WA 257

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus rubra	FACU-	11. Erythronium umbilicatum	FAC
2.		12.	
3.		13.	
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Prunus serotina	FACU	16. Toxicodendron radicans	FAC
7. Rosa multiflora	FACU	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 40%
Is the hydrophytic vegetation criterion met? Yes No X
Comments: Less than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Pope fine sandy loam
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-4"	10YR 3/2			loam
4-12"	10YR 4/4 (mixed w 10YR 3/1)			clay loam
12-24"	10YR 5/6			clay

Other hydric soil indicators:
Is the hydric soil criterion met? Yes No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes No X Depth to saturated soil:
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes No X
Comments:

Wetland Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA Date: 4/22/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP5 near
Municipality: RAINELLE Block: Lots: WD17

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		11. Typha latifolia	OBL
2.		12.	
3.		13.	
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Salix nigra	FACW+	16.	
7.		17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dommant species are FAC or wetter

Series/phase as mapped by SCS Pope fine sandy loam
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-13"	2.5Y 2.5/1	10YR 5/6	10%	clay loam
13-24"	2.5Y 5/1	10YR 5/6	20%	clay loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes X No
Comments: Soil is of low chroma values with mottling

Is the ground surface inundated? Yes ___ No X Surface water depth: ___
Is the soil saturated? Yes X No ___ Depth to saturated soil: 2"
Depth to free-standing water in soil probe hole: 4"
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes X No
Comments:

Wetland X Non Wetland ___

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA Date: 4/22/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP6 near Flag
Municipality: RAINELLE Block: Lots: WD1

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		11. Senecio aureus	FACW
2.		12. Equisetum arvense	FAC
3.		13.	
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Rhus typhina	NL	16.	
7. Salix nigra	FACW+	17.	
8. Rosa multiflora	FACU	18.	
9. Prunus serotina	FACU	19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 50%
Is the hydrophytic vegetation criterion met? Yes ___ No X
Comments: At least 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Pope fine sandy loam
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-3"	2.5Y 3/1			clay loam
3-7"	2.5Y 3/1	10YR 4/4	25%	clay loam
7-24"	10YR 4/4			clay

Other hydric soil indicators:
Is the hydric soil criterion met? Yes ___ No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes ___ No X Surface water depth: ___
Is the soil saturated? Yes ___ No X Depth to saturated soil: ___
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ___ No X
Comments:

Wetland ___ Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA / RUA Date: 9/13/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP7 near
Municipality: RAINELLE Block: Lots: Flag WE8

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	11. Osmunda cinnamomea	FACW
2.		12. Carex crinita	OBL
3.		13. Boehmeria cylindrica	FACW+
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Lindera benzoin	FACW-	16.	
7. Cornus amomum	FACW	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-3"	7.5YR 4/1	10YR 5/1 + 10YR 5/6	20/10	silty clay loam
3-13"	10YR 5/1	7.5YR 4/1 + 10YR 5/8	15/10	silty clay loam
13-24+	10YR 6/1	10YR 5/8	25	clay loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes X No
Comments: Soil is of low chroma values with mottling

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes X No Depth to saturated soil: 2"
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.
matted leaves, evidence of ponding
Is the wetland hydrology criterion met? Yes No
Comments:

Wetland X Non Wetland

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA / RUA Date: 9/13/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP8 near
Municipality: RAINELLE Block: Lots: Flag WE8

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	11. Polystichum acrostichoides	FACU-
2. Ostrya virginiana	FACU-	12. Parthenocissus quinquefolia	FACU
3.		13.	
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Crataegus sp.	ID	16.	
7. Fagus grandifolia	FACU	17.	
8. Hamamelis virginiana	FAC-	18.	
9. Carpinus caroliniana	FAC	19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 25%
Is the hydrophytic vegetation criterion met? Yes No X
Comments: Less than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Calvin and Gilpin very stony soils, 25-40% slopes
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-6"	10YR 3/3			sandy loam
6-11"	10YR 3/2			sandy loam
11-24"	10YR 4/3			sandy loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes No X Depth to saturated soil:
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.
Is the wetland hydrology criterion met? Yes No X
Comments:

Wetland Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/RVA Date: 9/13/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP9 near
Municipality: RAINELLE Block: Lots: Flag W.Y-37

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus palustris	FACW	11. Carex crinita	OBL
2.		12. Impatiens capensis	FACW
3.		13. Symplocarpus foetidus	OBL
4.		14. Onoclea sensibilis	FACW
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Viburnum dentatum	FAC	16. Toxicodendron radicans	FAC
7. Betula lenta	FACU	17.	
8. Fraxinus pennsylvanica	FACW	18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 88%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dominant species are FAC or wetter.

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-9"	10YR 4/1	7.5YR 4/6	10%	clay loam
9-	10YR 4/2	7.5YR 4/6	15%	clay

Auger slides straight down into hole - soil very wet
No recovery in auger

Other hydric soil indicators:
Is the hydric soil criterion met? Yes X No
Comments: Soil is of low chroma values with mottling

Is the ground surface inundated? Yes ___ No X Surface water depth: ___
Is the soil saturated? Yes X No ___ Depth to saturated soil: surface
Depth to free-standing water in soil probe hole: 2"
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes X No
Comments:

Wetland X Non Wetland ___

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/RVA Date: 9/13/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP10 near
Municipality: RAINELLE Block: Lots: Flag W.Y-37

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	11. Polystichum acrostichoides	FACU-
2. Acer platanoides	NL	12.	
3. Fagus grandifolia	FACU	13.	
4. Quercus alba	FACU	14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Hamamelis virginiana	FAC-	16.	
7.		17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 16%
Is the hydrophytic vegetation criterion met? Yes ___ No X
Comments: Less than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Calvin + Gilpin very stony soils, 25-40% slopes
Subgroup On hydric soils list NO

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-9"	5YR 3/2			loam
9-16"	5YR 3/4			loam w/pebbles
16-	2.5YR 5/4			gravelly loam w/pebbles

Other hydric soil indicators:
Is the hydric soil criterion met? Yes ___ No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes ___ No X Surface water depth: ___
Is the soil saturated? Yes ___ No X Depth to saturated soil: ___
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ___ No ___
Comments:

Wetland ___ Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: MAKOFKA/RUA Date: 9/15/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP11 near
Municipality: RAINELLE Block: Lots: Flags WH9 and WF94

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus palustris	FACW	11. Impatiens capensis	FACW
2. Cornus Florida	FACU-	12. Carex crinita	OBL
3.		13. Symplocarpus Foetidus	OBL
4.		14. Sphagnum spp	NL
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6.		16.	
7.		17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 66%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dominant species are FAC or wetter.

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-7"	10YR 3/2			clay loam
7-24"	10YR 3/2	10YR 4/6	50%	clay loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes ___ No
Comments: Soil is of low chroma values with mottling.

Is the ground surface inundated? Yes ___ No X Surface water depth: ___
Is the soil saturated? Yes ___ No X Depth to saturated soil: ___
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes X No
Comments:

Wetland X Non Wetland ___

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: RUA/MAKOFKA Date: 9/15/04
Project/Site: WGC State: WV County: GREENBRIER
Applicant/Owner: Sample Point #: SP12 near
Municipality: RAINELLE Block: Lots: Flag WF94

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Fagus grandifolia	FACU	11. Solidago sp	ID
2. Quercus rubra	FACU-	12.	
3. Carya ovata	FACU-	13.	
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Crataegus sp.	ID	16. Smilax rotundifolia	FAC
7. Berberis cf. vulgaris	FACU	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 14%
Is the hydrophytic vegetation criterion met? Yes ___ No X
Comments: Less than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-5"	10YR 3/4			loam
5-9"	10YR 3/6			loam
9-24"	7.5YR 4/6			loam

Other hydric soil indicators:
Is the hydric soil criterion met? Yes ___ No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes ___ No X Surface water depth: ___
Is the soil saturated? Yes ___ No X Depth to saturated soil: ___
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ___ No X
Comments:

Wetland ___ Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: RVA/McMillan Date: 10/19/04
Project/Site: WGC State: WV County: Greenbrier
Applicant/Owner: Sample Point #: SP13 near
Municipality: RAINELLE Block: Lots: Flag WF 126

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Crataegus sp.	ID	11. Polystichum acrostichoides	FACU-
2. Acer rubrum	FAC	12. Viola papilionacea	FAC
3. Fagus grandifolia	FACU	13.	
4. Acer platanoides	NL	14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Viburnum dentatum	FAC	16.	
7. Viburnum acerifolium	NL	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 37%
Is the hydrophytic vegetation criterion met? Yes No X
Comments: Less than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-6"	10YR 4/3			clay loam
6-10"	10YR 4/3	10YR 3/2	5%	clay loam
10-13"	5YR 4/4	10YR 5/6	5%	clay loam
13-15+	5YR 4/4	10YR 5/6	5%	sandy clay loam

auger refusal at 15" due to rock

Other hydric soil indicators:
Is the hydric soil criterion met? Yes No X
Comments: Soil is of high chroma values

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes No X Depth to saturated soil:
Depth to free-standing water in soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes No X
Comments:

Wetland Non Wetland X

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD

Field Investigators: RVA/McMillan Date: 10/19/04
Project/Site: WGC State: WV County: Greenbrier
Applicant/Owner: Sample Point #: SP14 near
Municipality: RAINELLE Block: Lots: Flags WF 126

Do normal environmental conditions exist at the plant community?
Yes X No
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes No X

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Carpinus caroliniana	FAC	11. Polystichum acrostichoides	FACU-
2. Quercus palustris	FACW	12. Symplocarpus foetidus	OBL
3.		13.	
4.		14.	
5.		15.	
Saplings/Shrubs		**Woody Vines**	
6. Hamamelis virginiana	FAC-	16. Smilax rotundifolia	FAC
7. Viburnum dentatum	FAC	17.	
8.		18.	
9.		19.	
10.		20.	

Percent of dominant species that are OBL, FACW, and/or FAC 71%
Is the hydrophytic vegetation criterion met? Yes X No
Comments: Greater than 50% of the dominant species are FAC or wetter

Series/phase as mapped by SCS Atkins silt loam
Subgroup On hydric soils list YES

DEPTH	MATRIX COLOR	MOTTLE COLOR	MOTTLING%	TEXTURE
0-3"	10YR 4/1			clay loam
3-8"	10YR 5/1	10YR 5/8 + 10YR 6/1	10/5%	clay loam
8-24"	10YR 5/1	10YR 5/8	25%	clay

Other hydric soil indicators:
Is the hydric soil criterion met? Yes X No
Comments: Soil is of low chroma values with mottling

Is the ground surface inundated? Yes No X Surface water depth:
Is the soil saturated? Yes X No Depth to saturated soil: Surface
Depth to free-standing water in soil probe hole: 1"
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes X No
Comments:

Wetland X Non Wetland

LIST OF DATA SHEET LOCATIONS (Soil Points)

Soil Point Number	Location	Wetland or Upland Point
Soil Point 1	Near Wetland Flag WA142	Wetland
Soil Point 2	Near Wetland Flag WC60	Upland
Soil Point 3	Near Wetland Flag W257	Wetland
Soil Point 4	Near Wetland Flag W257	Upland
Soil Point 5	Near Wetland Flag WD17	Wetland
Soil Point 6	Near Wetland Flag W1	Upland
Soil Point 7	Near Wetland Flag WE8	Wetland
Soil Point 8	Near Wetland Flag WE8	Upland
Soil Point 9	Near Wetland Flag WY37	Wetland
Soil Point 10	Near Wetland Flag WY37	Upland
Soil Point 11	Near Wetland Flag WH9/WF94	Wetland
Soil Point 12	Near Wetland Flag WF94	Upland
Soil Point 13	Near Wetland Flag W126	Upland
Soil Point 14	Near Wetland Flag W126	Wetland

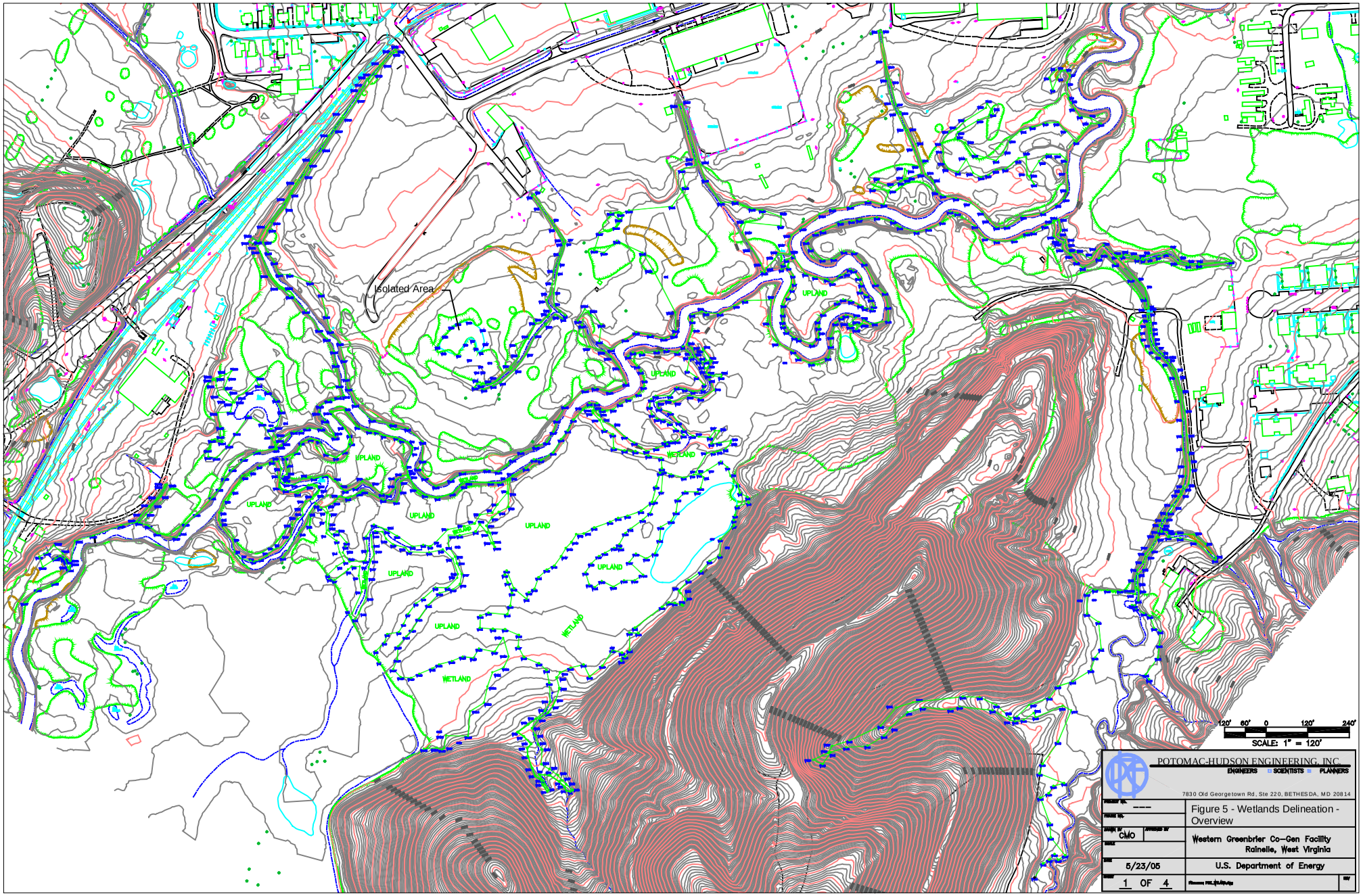
Wetland Flag Information

Flag/Stake Numbers	Water/Wetland Type & Location	Notes
WA1 - WA337	Delineates northern edge of Sewell Creek, a tributary in a wooded area, three ditches & eastern edge of Wolfpen Creek	WA1-WA308 (blue) WA309-WA337 (pink/black) Photos 1-9 & 12, 13, 21
WB1 – WB41- WB1	Delineates a ditch in field on northern side of Sewell Creek. Connected to WA line via a culvert.	all blue flags
WC1 – WC69, WC69a – WC69e, WC70-WC118	Begins at edge of disturbed area on south side of Sewell Creek, delineates tributary, southern edge of Sewell Creek & western edge of a tributary on the eastern edge of the site.	all blue flags Photos 10 & 18
WD1 – WD17 - WD1	Isolated, emergent wetland located within field on north side of Sewell Creek	Isolated wetland; all blue flags Photo 11
WE1 - WE49	Southern edge of wooded wetland at base of hill on south side of Sewell Creek & a tributary	all pink/black flags
WF1 – WF69 WF69a-WF87 WF87a, WF87b WF88 – WF130	Begins at top of tributary within site boundaries across from WE49, continues through wooded area, delineates a tributary, then part of southern edge of Sewell Creek, then back into the woods. Ends at tree line on western edge of site.	all pink/black flags Photo 24
WG1 - WG48 –WG1	Delineates a tributary and part of the southern edge of Sewell Creek, delineating an upland pocket	all pink/black flags
WH1 – WH46 - WH1	Delineates two tributaries in wooded area & part of southern edge of Sewell Creek to create an upland pocket	all pink/black flags
WJ1 – WJ31	Begins on edge of tree line on western edge of site on south side of Sewell Creek.	all pink/black flags Photo 23
WK1 – WK8	Begins & ends on edge of tree line on western edge of site on south side of Sewell Creek	all pink/black flags Photos 22 & 23
WL1 – WL14	Begins & ends along western edge of site on south side of Sewell Creek	all pink/black flags Photo 22
WO1 – WO35 – WO1	Delineates tributaries and part of southern side of Sewell Creek near western edge of	all pink/black flags

	site. Isolates an upland pocket	
WP1 – WP12, WP12a, WP13 – WP45 – WP1	Delineates south side of Sewell Creek and tributaries in wooded area; delineates isolated upland pocket	all pink/black flags
WR1 – WR42 – WR1	Delineates oxbow of Sewell Creek in center of site	all pink/black flags
WV1 – WV38 – WV1	Delineates an isolated, upland pocket within wooded area at base of hill on south side of Sewell Creek	all pink/black flags
WX1 – WX32	Delineates tributary on eastern edge of site on south side of Sewell Creek	all pink/black flags Photos 18 & 19
WY1 – WY92	Delineates western side of tributary located on eastern edge of site on south side of Sewell Creek	all pink/black flags Photos 14-17 & 20
WZ1 – WZ55	Delineates eastern side of tributary located on eastern edge of site on south side of Sewell Creek	all pink/black flags Photos 14, 15 & 20

NOTES:

- The following flags are missing from the map and may or may not have been marked in the field: WA270, WA274, WY26. Their absence from the map does not have a significant impact on the wetland boundaries represented.
- The flags established to mark the wetland boundaries were typically tied to vegetation. However, in instances where no sturdy vegetation was present, the wetland flags were tied to wooden stakes instead.



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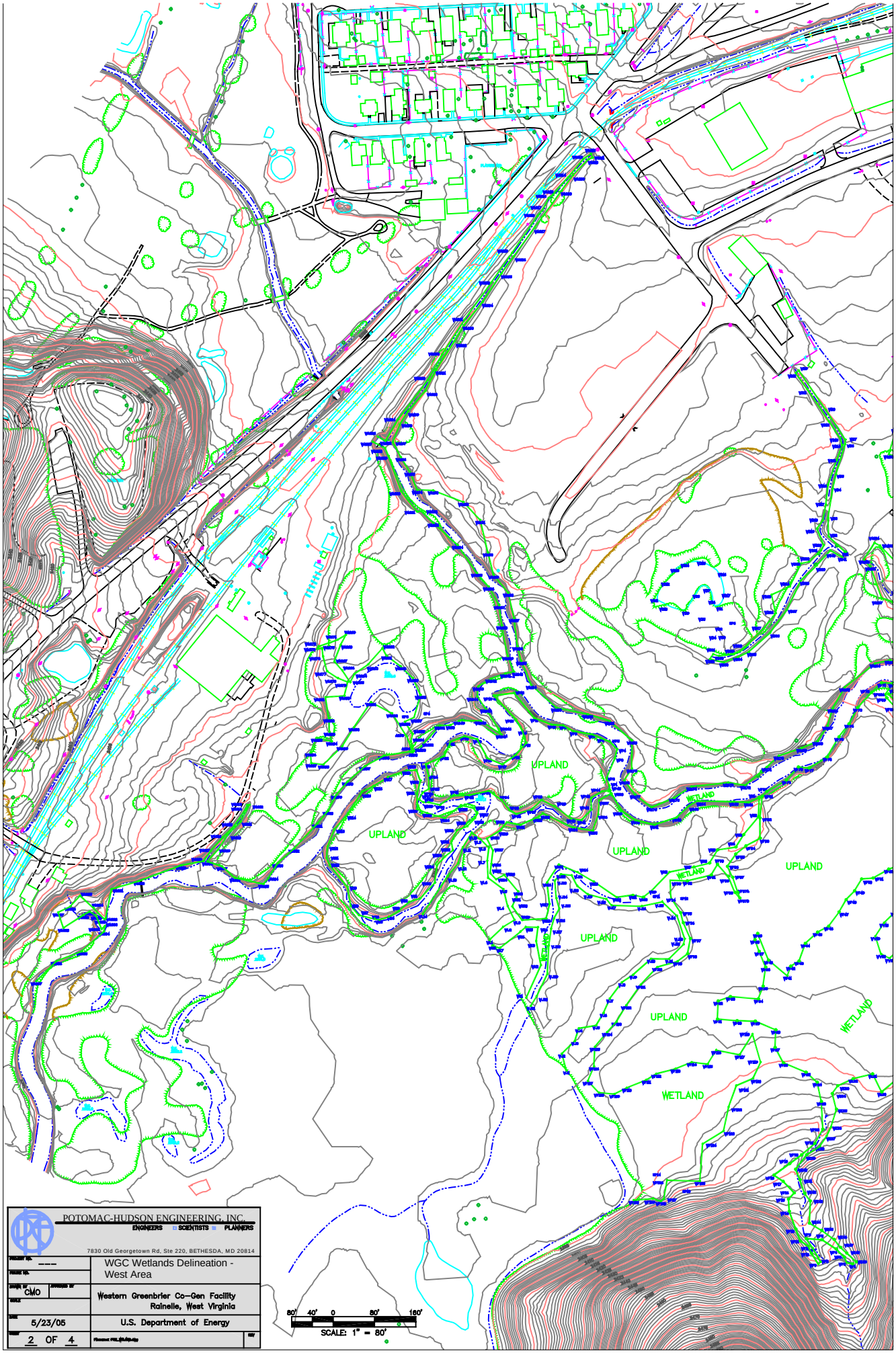
PROJECT NO. ———	Figure 5 - Wetlands Delineation - Overview
FILE NO.	
DRAWN BY CMO / APPROVED BY	Western Greenbrier Co-Gen Facility Rainelle, West Virginia
SCALE	
DATE 5/23/05	U.S. Department of Energy
SHEET 1 OF 4	REV



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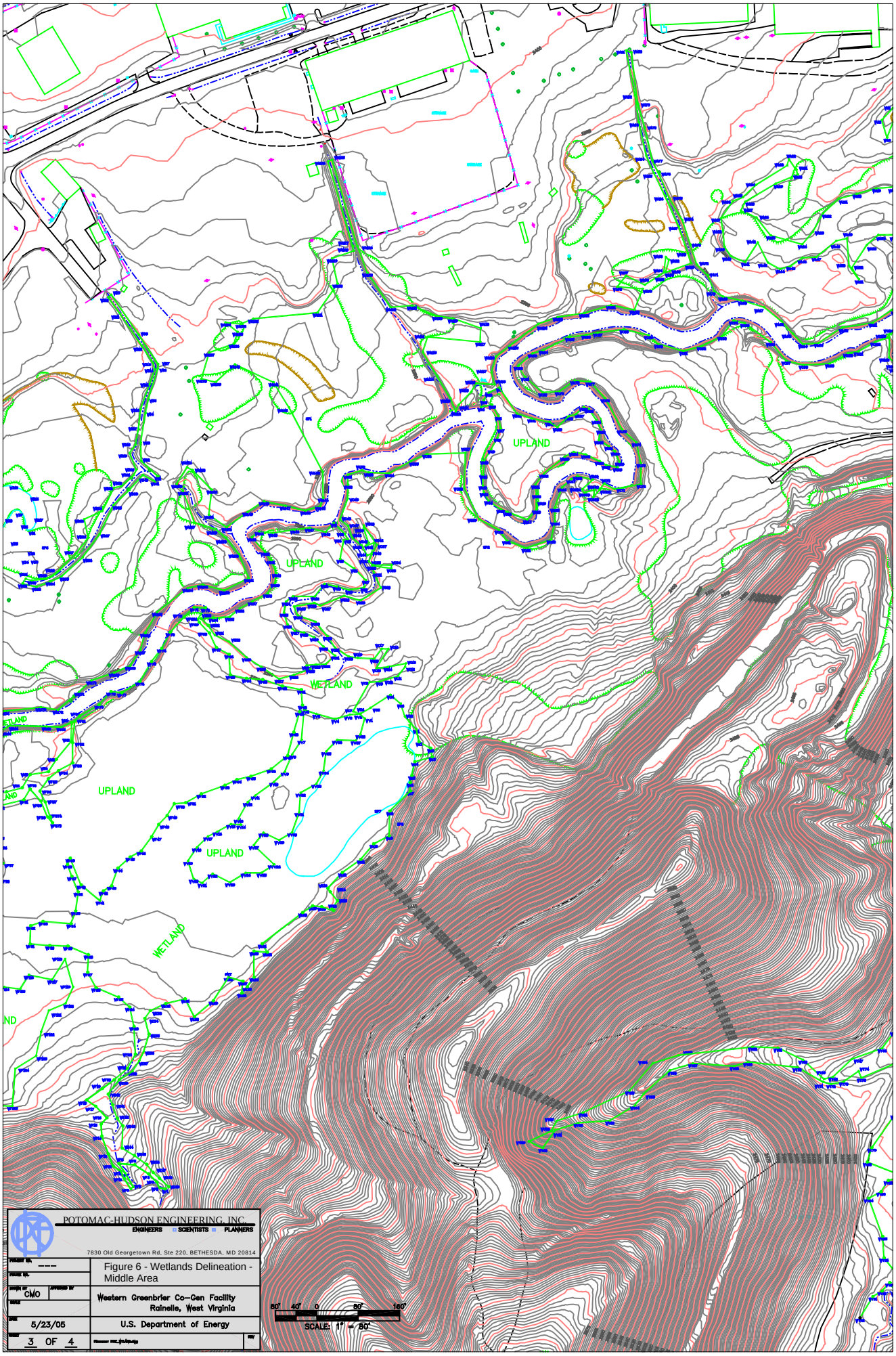
PROJECT NO. ----	WGC Wetlands Delineation - West Area
DRAWN BY CMO / APPROVED BY	Western Greenbrier Co-Gen Facility Rainelle, West Virginia
DATE 5/23/05	U.S. Department of Energy
SHEET 2 OF 4	REV



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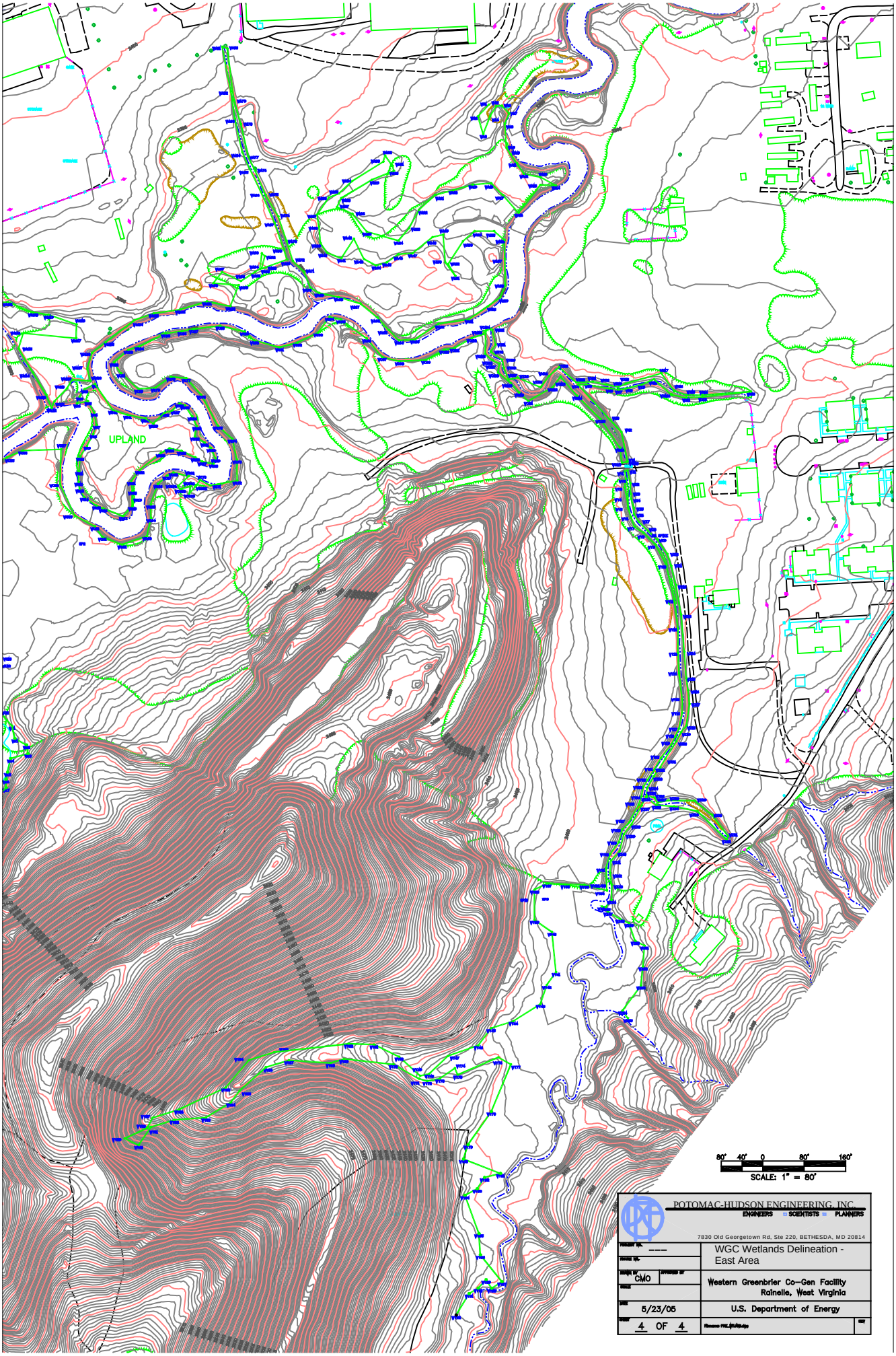
PROJECT NO. ----	Figure 6 - Wetlands Delineation - Middle Area
DRAWN BY CMO / APPROVED BY	Western Greenbrier Co-Gen Facility Rainelle, West Virginia
DATE 5/23/05	U.S. Department of Energy
SHEET 3 OF 4	REV



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PROJECT NO. ----	WGC Wetlands Delineation - East Area
DRAWN BY CMO / APPROVED BY	Western Greenbrier Co-Gen Facility Rainelle, West Virginia
DATE 5/23/05	U.S. Department of Energy
SHEET 4 OF 4	REV