

THE TENNESSEE VALLEY AUTHORITY



Clinch River Small Modular Reactor Site

Supplemental Wetland Survey Report Barge/Traffic Area

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06/17/2015

Revision 0 - 05/01/2015

Revision 1 - 06/17/2015

This study has been prepared as a supporting document for the Clinch River Small Modular Reactor Site (CR SMR) Construction Permit Application Project and is being distributed for project use. The study provides a summary of documented wetland habitats present in CR SMR barge/traffic study area including the adjacent Clinch River, Roane County, TN.

Initial wetland screening for the Clinch River Small Modular Reactor (CR SMR) barge/traffic site involved a review of National Wetland Inventory (NWI) maps and soil survey maps. Subsequent field surveys to determine habitat types and map wetland boundaries were completed on April 22, 2015. The barge/traffic area is approximately 122 acres southeast of Gallaher Road/Highway 58 and northwest of the CR SMR site. Portions of the barge/traffic area lie along the Clinch River and include portions of a transmission line right-of-way as well as areas of natural upland and wetland habitat. Five wetlands were field delineated during the site visits (Figure 1). Wetland boundaries were mapped with a Trimble ProXH global positioning system and ESRI ArcGIS 10 mapping software.

Wetlands are protected under Sections 404 and 401 of the Clean Water Act (CWA) and by Executive Order (E.O.) 11990, *Wetlands Protection*. In order to conduct specific activities in wetlands, authorization under a Section 404 Permit from the U. S. Army Corps of Engineers (USACE) may be required depending on the wetland's size and hydrologic connectivity to a navigable waterway. Section 401 gives states the authority to certify whether activities permitted under Section 404 are in accordance with state water quality standards. In Tennessee, the Department of Environment and Conservation Division of Water Pollution Control is responsible for issuing Section 401 water quality certification through the Aquatic Resource Alteration Permit. E.O. 11990 requires all federal agencies to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.

Wetland determinations and assessment of wetland condition were performed as described in the wetland survey report prepared for the Clinch River Modular Reactor Site (Tennessee Valley Authority, Revision 2, 2015). The USACE Routine Wetland Determination forms and TVA Rapid Assessment Method (TVA RAM) forms are attached (Wetland Appendix A).

Table 1: Wetlands on the Clinch River SMR Barge/Traffic Site.

Wetland ID	Wetland Type¹	TVARAM Category (Score)	Total Wetland Acreage at Site	Jurisdictional Status²
Wetland 13	PSS1E/PEM1E	2 (41)	3.73	To be determined
Wetland 14	PSS1E/PEM1E	2 (41)	3.05	To be determined
Wetland 15	PFO1E	2 (55)	1.95	To be determined
Wetland 16	PEM1F	2 (53)	0.11	To be determined

Wetland 17	PSS1Hh	3 (68)	1.33	To be determined
Totals			10.17	

¹ Classification codes as defined in Cowardin et al. 1979: PSS1E = Palustrine scrub-shrub, persistent vegetation, seasonally flooded/saturated; PEM1E = Palustrine emergent, persistent vegetation, seasonally flooded/saturated; PFO1E= Palustrine forested, broad-leaved deciduous vegetation, seasonally flooded/saturated; PEM1F = Palustrine emergent, persistent vegetation, semi-permanently flooded; PSS1Hh= Palustrine scrub-shrub, broad-leaved deciduous vegetation, permanently flooded, diked/impounded.

² Jurisdictional status to be determined by USACE personnel during future site visit

Wetland 13 (W-13) is a 3.73-acre scrub-shrub/emergent wetland associated with a channelized, perennial, unnamed tributary of Clinch River. The wetland also lies under a transmission line and is maintained as a scrub-shrub/emergent wetland as the result of transmission line maintenance. This wetland exhibits wetland hydrology and connectivity. Field indicators of hydric soils are lacking, possibly due to extensive site disturbance during the 1970s during site preparation for the Clinch River Breeder Reactor project and subsequent sedimentation. Dominant hydrophytic vegetation in the ROW includes green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), broom panicgrass (*Dicanthelium scoparium*), silky dogwood (*Cornus amomum*), common rush (*Juncus effusus*), swamp rose (*Rosa palustris*), Southern blackberry (*Rubus argutus*), red maple (*Acer rubrum*), and swamp dock (*Rumex verticillatus*). The TVA RAM score for this wetland was 41 (Category 2 -moderate quality).

Wetland 14 (W-14) lies south of Wetland A and is separated by an existing road bed. It is similar in type, landscape position and vegetation to Wetland A and is associated with the same unnamed perennial stream. The wetland covers 3.05- acres in the barge/traffic area. The TVA RAM score for this wetland was 41, putting it into Category 2, a wetland of moderate quality.

Wetland 15 (W-15) is a forested wetland located along the northern edge of Bear Creek Road. The wetland covers 1.95- acres in the project area and exhibits wetland hydrology, hydric soils, and connectivity. Dominant vegetation includes American sycamore (*Platanus occidentalis*), common rush, Virginia creeper (*Parthenocissus quinquefolia*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), green ash, Nepalese browntop (*Microstegium vimineum*), poison ivy (*Toxicodendrum radicans*), river oats (*Chasmanthium latifolium*), and Chinese privet (*Ligustrum sinense*). The TVA RAM score for this wetland was 55 (Category 2 - moderate quality).

Wetland 16 (W-16) is a small (0.11-acre) emergent wetland associated with the terminus of an intermittent stream. Dominant vegetation includes jewelweed (*Impatiens capensis*), aster (*Aster spp.*), bedstraw (*Galium spp.*), and false nettle (*Boehmeria cylindrica*). The TVA RAM score for this wetland was 53, putting it into Category 2, a wetland of moderate quality.

Figure 1 - Wetlands-Clinch River SMR Barge/Traffic Area



Wetland 17 (W-17) is a scrub-shrub wetland located on a small embayment on the Clinch River shoreline. The wetland covers 1.33-acres in the project area. The wetland exhibits wetland hydrology, hydric soils, and connectivity. Dominant vegetation includes green ash, American sycamore, giant river cane (*Arundinaria gigantea*), and common rush. The TVA RAM score for this wetland was 68 (Category 3 -high quality wetland).

Impacts to wetlands will be determined based on site-specific project plans, taking into account site topography and siting constraints of the barge/traffic area. Mitigation for wetland impacts will be aligned with 2008 EPA/USACE guidelines (EPA & USACE 2008). First preference is mitigation via purchase of credits in an approved mitigation bank. If no mitigation banks are available mitigation may be accomplished via payment into an approved in-lieu fee program. Additional options for mitigation include on-site wetland restoration, wetland creation, or enhancement/preservation, or off-site wetland restoration/creation/enhancement/preservation.

Literature Cited

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetland and Deepwater Habitats of the United States. Washington, D.C.: U.S. Fish and Wildlife Publication FWS/OBS-79/31.

Tennessee Valley Authority. 2015, Revision 2. Clinch River Small Modular Reactor Site: Wetland Survey Report.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. 2008. Compensatory Mitigation for Losses of Aquatic Resources. Final rule. Federal Register. Vol. 73, No. 70: pp. 19594-19705.

Appendix A –

USACE Routine Wetland Determination Forms & TVA RAM Assessment Methodology Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Clinch River S.M.R. Site - Base Area City/County: Roane County Sampling Date: 04/22/2015
 Applicant/Owner: Tennessee Valley Authority State: TN Sampling Point: Wetland A
 Investigator(s): K. Pilarski-Hall; Adam Kenner Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace - Clinch Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: No soil map NWI classification: PSS1E/PEM1F
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks:

TVA RAM - Category 2

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____	Wetland Hydrology Present? Yes _____ No _____
Water Table Present? Yes _____ No _____ Depth (inches): _____	
Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

*Perennial stream - dredged; under TL ROW -
regular spraying - standing dead shrubs*

TVA RAM = 41

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA

Tree Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
		= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Cornus amomum</i>			
2.	<i>Salix nigra</i>			
3.	<i>Fraxinus penn.</i>			
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		= Total Cover		
Herb Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Juncus effusus</i>			
2.	<i>Dicentra spectabilis</i>			
3.	<i>Rumex verticillatus</i>			
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		= Total Cover		
Woody Vine Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Rubus cuneatus</i>			
2.	<i>Rosa pratincola</i>			
3.				
4.				
5.				
6.				
		= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤ 3.0 ¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Sampling Point: WA

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Indicators for Problematic Hydric Soils³:

- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Hydric Soil Present? Yes ✓ No Hydric Soil Present? Yes ✓ No

Remarks:

Hand-drawn map showing a field area with various features and labels:

- Top Left:** "Hwy 54" written along a diagonal line.
- Bottom Left:** "Chick R." written near a diagonal line.
- Top Right:** "Bear Cr. Rd." written near a diagonal line.
- Center:** A wavy line labeled "potential stream" with arrows pointing downwards.
- Bottom Right:** A diagonal line labeled "Road bed" with an arrow pointing downwards.
- Other Labels:** "1/4 Row" is written near the bottom right.
- Symbols:** Several 'X' marks and 'V' marks are scattered across the field area.

TVARAM Field Form Quantitative Rating

Site: *Clinch River SMR - Burge Triller* Rater(s): *Pilarski - Hall / Kennon* Date: *04/22/2015*

5 5
max 6 pts subtotal

Metric 1. Wetland Area (size)

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
☒ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
☐ <0.1 acre (0.04 ha) (0)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Sources/assumptions for size estimate (list):

Trimbler GPS

12 17
max 16 pts subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☒ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

14 31
max 30 pts subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
☐ Other groundwater (3) [BR/CM (5)]
☒ Precipitation (1) [unless BR/CM primary source (5)]
☐ Seasonal/intermittent surface water (3)
☒ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
☒ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
☐ Recovered (7)
☒ Recovering (3)
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☒ 100-year floodplain (1)
☒ Between stream/lake and other human use (1)
☐ Part of wetland/upland (e.g., forest), complex (1)
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3) [BR/CM (4)]
☒ Seasonally inundated (2) [BR/CM (4)]
☒ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- ☒ ditch ☐ point source (nonstormwater)
☐ tile (including culvert) ☐ filling/grading
☐ dike ☒ road bed/RR track
☐ weir ☐ dredging
☐ stormwater input ☐ other _____

5 36
max 20 pts subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
☐ Recovered (3)
☒ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☒ Moderately good (4)
☐ Fair (3)
☐ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
☐ Recovered (6)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing ☒ shrub/sapling removal
☐ grazing ☒ herbaceous/aquatic bed removal
☐ clearcutting ☐ woody debris removal
☐ selective cutting ☐ sedimentation
☐ farming ☐ dredging
☐ toxic pollutants ☐ nutrient enrichment

36
subtotal this page

TVARAM Field Form Quantitative Rating

Site: Clinch SMR- Barge Traffic Area

Rater(s): P. Harsanyi-Hall/Kennon

Date: 04/22/2015

36
subtotal previous page0 36
max 10 pts subtotal0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh; buttress, mulittrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality): <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6 41
max 20 pts subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.

Score all present using 0 to 3 scale.

- ☒ Aquatic bed
- ☒ Emergent
- ☒ Shrub
- ☒ Forest
- ☒ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen, Other

6b. Horizontal (plan view) interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3) [BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☒ Low (1) [BR/CM (2)]
- ☐ None (0)

6c. Coverage of invasive plants.

Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☒ Coarse woody debris >15 cm (6 in.)
- ☒ Standing dead >25 cm (10 in.) dbh
- ☒ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre

[For BR/CM <0.04 ha (0.1 acre)]

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

Mudflat and Open Water Class Quality

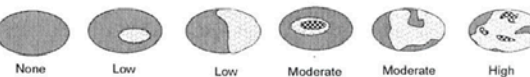
0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



None

Low

Low

Moderate

Moderate

High

Microtopography Cover Scale

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

41

GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.ch.us/dsw/401401.html>

Last revised 2005-04-29

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Clinch River SMC Site-Barge Area City/County: Roane County Sampling Date: 04/22/2015
 Applicant/Owner: Tennessee Valley Authority State: TN Sampling Point: Wetland B
 Investigator(s): R. P. L. S. H. H. / A. K. R. N. M. Section, Township, Range: _____
 Landform (hillside, terrace, etc.): terrace - OH Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: No soil map NWI classification: PSSIE/PEMIE
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

*Perennial stream – dredged; under the ROW –
 Regular spraying – standing dead shrubs*

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

☒ Surface Water (A1)
☒ High Water Table (A2)
☒ Saturation (A3)
 _____ Water Marks (B1)
 _____ Sediment Deposits (B2)
 _____ Drift Deposits (B3)
 _____ Algal Mat or Crust (B4)
 _____ Iron Deposits (B5)
 _____ Inundation Visible on Aerial Imagery (B7)
 _____ Water-Stained Leaves (B9)
 _____ Aquatic Fauna (B13)

_____ True Aquatic Plants (B14)
 _____ Hydrogen Sulfide Odor (C1)
 _____ Oxidized Rhizospheres on Living Roots (C3)
 _____ Presence of Reduced Iron (C4)
 _____ Recent Iron Reduction in Tilled Soils (C6)
 _____ Thin Muck Surface (C7)
 _____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

_____ Surface Soil Cracks (B6)
 _____ Sparsely Vegetated Concave Surface (B8)
 _____ Drainage Patterns (B10)
 _____ Moss Trim Lines (B16)
 _____ Dry-Season Water Table (C2)
 _____ Crayfish Burrows (C8)
 _____ Saturation Visible on Aerial Imagery (C9)
 _____ Stunted or Stressed Plants (D1)
 _____ Geomorphic Position (D2)
 _____ Shallow Aquitard (D3)
 _____ Microtopographic Relief (D4)
 _____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____
 Water Table Present? Yes _____ No _____ Depth (inches): _____
 Saturation Present? Yes _____ No _____ Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

P

TVA DAM = 41 - Category 2

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)			
1. <i>Cornus amomum</i>			
2. <i>Salix nigra</i>			
3. <i>Myr. penn</i>			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
_____ = Total Cover			
Herb Stratum (Plot size: _____)			
1. <i>Ajuncus effusus</i>			
2. <i>Rumex crispus</i>			
3. <i>Diarrhena scaparrum</i>			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
_____ = Total Cover			
Woody Vine Stratum (Plot size: _____)			
1. <i>Rubus argutus</i>			
2. <i>Rosa palachm</i>			
3.			
4.			
5.			
6.			
_____ = Total Cover			

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Sampling Point: WB

Sampling Point: WB

[illegible]²Location: PL=Pore Lining, M=Matrix.

Indicators for Problematic Hydric Soils³:

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> ___ Histosol (A1) ___ Histic Epipedon (A2) ___ Black Histic (A3) ___ Hydrogen Sulfide (A4) ___ Stratified Layers (A5) ___ 2 cm Muck (A10) (LRR N) ___ Depleted Below Dark Surface (A11) ___ Thick Dark Surface (A12) ___ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) ___ Sandy Gleyed Matrix (S4) ___ Sandy Redox (S5) ___ Stripped Matrix (S6) | <ul style="list-style-type: none"> ___ Dark Surface (S7) ___ Polyvalue Below Surface (S8) (MLRA 147, 148) ___ Thin Dark Surface (S9) (MLRA 147, 148) ___ Loamy Gleyed Matrix (F2) ___ Depleted Matrix (F3) ___ Redox Dark Surface (F6) ___ Depleted Dark Surface (F7) ___ Redox Depressions (F8) ___ Iron-Manganese Masses (F12) (LRR N, MLRA 136) ___ Umbric Surface (F13) (MLRA 136, 122) ___ Piedmont Floodplain Soils (F19) (MLRA 148) | <ul style="list-style-type: none"> ___ 2 cm Muck (A10) (MLRA 147) ___ Coast Prairie Redox (A16) (MLRA 147, 148) ___ Piedmont Floodplain Soils (F19) (MLRA 136, 147) ___ Red Parent Material (TF2) ___ Very Shallow Dark Surface (TF12) ___ Other (Explain in Remarks) |
|--|---|---|

Type: _____
Depth (inches): 1 _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Remarks:

Road Bed

stream to road

Bear Cr. Rd.

TVARAM Field Form Quantitative Rating

Site: Clinch SMR - Barge Traffic Area Rater(s): Plaisier-Hall/Kennon Date: 04/22/20155 5
max 6 pts. subtotal

Metric 1. Wetland Area (size)

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
☐ 5 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
☐ <0.1 acre (0.04 ha) (0)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Sources/assumptions for size estimate (list):

Trimble GPS unit

12 12
max 14 pts. subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☒ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

14 31
max 30 pts. subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
☐ Other groundwater (3) [BR/CM (5)]
☒ Precipitation (1) [unless BR/CM primary source (5)]
☐ Seasonal/intermittent surface water (3)
☒ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
☐ Recovered (7)
☒ Recovering (3)
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☒ 100-year floodplain (1)
☒ Between stream/lake and other human use (1)
☐ Part of wetland/upland (e.g., forest), complex (1)
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3) [BR/CM (4)]
☐ Seasonally inundated (2) [BR/CM (4)]
☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- ☒ ditch ☐ point source (nonstormwater)
☐ tile (including culvert) ☐ filling/grading
☐ dike ☒ road bed/RR track
☐ weir ☐ dredging
☐ stormwater input ☐ other _____

5 36
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
☐ Recovered (3)
☒ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☒ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
☐ Recovered (6)
☒ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing ☒ shrub/sapling removal
☐ grazing ☒ herbaceous/aquatic bed removal
☐ clearcutting ☐ woody debris removal
☐ selective cutting ☐ sedimentation
☐ farming ☐ dredging
☐ toxic pollutants ☐ nutrient enrichment

36
subtotal this page

TVARAM Field Form Quantitative Rating

W-B

Site: Clinch Smr - Barge Traffic Rater(s): Plowski-Hall/Kennan Date: 04/22/2015

36
subtotal previous page

Site

0 36
max 10 pts subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh; buttress, mulittrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality): <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

5 41
max 20 pts subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- ☒ Aquatic bed
- ☒ Emergent
- ☒ Shrub
- ☒ Forest
- ☒ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other

6b. Horizontal (plan view) interspersion. Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3) [BR/CM (5)]
- ☒ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

6c. Coverage of invasive plants.

Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☒ Coarse woody debris >15 cm (6 in.)
- ☒ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre

[For BR/CM <0.04 ha (0.1 acre)]

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

Mudflat and Open Water Class Quality

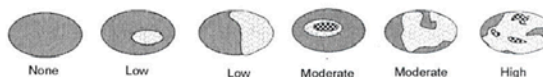
0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

41

GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.ch.us/dswai/401401.html>

Last revised 2005-04-29

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Clack River SMC Site - Barge Area City/County: Roane County Sampling Date: 04/22/2015
 Applicant/Owner: Tennessee Valley Authority State: TN Sampling Point: Wetland C
 Investigator(s): R. Pihurski-Hall; A. Penner Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace - clack Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: No soil mapping available NWI classification: PFO1E
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: <u>TVA RAM = 55 (Category 2)</u>	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6"</u>		
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u>		
(includes capillary fringe)		Wetland Hydrology Present? Yes _____ No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: <u>Forested wetland @ base/foe of road berm south of Bear Creek Rd.</u>		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WC

Tree Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Platanus occidentalis</i>			
2.	<i>Liquidambar styraciflua</i>			
3.	<i>Acer rubrum</i>			
4.	<i>Frax penn</i>			
5.				
6.				
7.				
8.				
		= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)				
1.				
2.	<i>Ligustrum sinense</i>			
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		= Total Cover		
Herb Stratum (Plot size: _____)				
1.	<i>Andropogon glaucus</i>			
2.	<i>Microrhiza vimineum</i>			
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1.	<i>Pachynotus quinquefolia</i>			
2.	<i>Toxicodendron radicans</i>			
3.				
4.				
5.				
6.				
		= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Sampling Point: WC

[illegible]²Location: PL=Pore Lining, M=Matrix.

Indicators for Problematic Hydric Soils³:

- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ✓ No

Hand-drawn map of Wetland A. The map is bounded by Highway 5 (HWY 5) on the left and Bear Creek Rd. on the right. Two trees are drawn in the center. A berm is indicated by a line, and small intermittent channels are shown below it. An arrow points north (↑ N). The label 'Wetland A' is written at the bottom.

TVARAM Field Form Quantitative Rating

Site: Clinch River SML - Barje Area

Rater(s): P. Plarski - Hall/Kennan

Date: 04/22/2015

3

max 6 pts.

3

subtotal

Metric 1. Wetland Area (size)

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
☐ <0.1 acre (0.04 ha) (0)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Sources/assumptions for size estimate (list):

7

max 14 pts.

10

subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
☒ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16

max 30 pts.

26

subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
☐ Other groundwater (3) [BR/CM (5)]
☒ Precipitation (1) [unless BR/CM primary source (5)]
☒ Seasonal/intermittent surface water (3)
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☒ 100-year floodplain (1)
☐ Between stream/lake and other human use (1)
☐ Part of wetland/upland (e.g., forest), complex (1)
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
☐ Regularly inundated/saturated (3) [BR/CM (4)]
☐ Seasonally inundated (2) [BR/CM (4)]
☒ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- ☐ ditch
☐ tile (including culvert)
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☐ filling/grading
☒ road bed/RR track
☐ dredging
☐ other _____

18

max 20 pts.

44

subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
☐ Recovered (3)
☐ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☐ Very good (6)
☒ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☐ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☒ None or none apparent (9)
☐ Recovered (6)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
☐ grazing
☐ clearcutting
☐ selective cutting
☐ farming
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ woody debris removal
☐ sedimentation
☐ dredging
☐ nutrient enrichment

44

subtotal this page

TVARAM Field Form Quantitative Rating

Site: Clinch River SML - Bayge Area Rater(s): Pluriski - Hall / Lennon Date: 04/22/2015

44
subtotal previous page

0 44
max 10 pts subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality): <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

11 55
max 20 pts subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- ☒ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☒ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen, Other

6b. Horizontal (plan view) interspersions. Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☒ Moderate (3) [BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

6c. Coverage of invasive plants.

Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☒ Coarse woody debris >15 cm (6 in.)
- ☒ Standing dead >25 cm (10 in.) dbh
- ☒ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre
[For BR/CM <0.04 ha (0.1 acre)]

- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

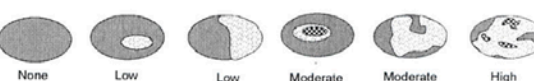
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion**Microtopography Cover Scale**

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

55

GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.ch.us/dsw/i401401.html>

Last revised 2005-04-29

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Clinch River SML - Barge Area City/County: Roane County Sampling Date: 04/22/2015
 Applicant/Owner: Tennessee Valley Authority State: TN Sampling Point: Wetland D
 Investigator(s): K. Pilarski-Hall / P.A. Kennon Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): hollow Local relief (concave, convex, none): CONCAVE Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: No Soil Map NWI classification: PEMIF
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: <u>TVA RAM - Category 2</u>	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) _____ Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) _____ Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) _____ <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) _____ <input type="checkbox"/> Water-Stained Leaves (B9) _____ <input type="checkbox"/> Aquatic Fauna (B13) _____		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>~ 4"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: <u>Shallow braided stream channel spreading out at base of hill + road bed/berm</u>		

TVA RAM = 53

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WD

Tree Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Platanus occidentalis</i>			
2.				
3.				
4.				
5.				
6.				
7.				
8.				
		= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)				
1.	<i>Ligustrum sinense</i>			
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		= Total Cover		
Herb Stratum (Plot size: _____)				
1.	<i>Impatiens capensis</i>			
2.	<i>Sparganium angustifolium</i>			
3.	<i>Aster</i> spp.			
4.	<i>Beckmannia cylindrica</i>			
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
5.				
6.				
		= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is $\leq 3.0^1$

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Sampling Point: W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Indicators for Problematic Hydric Soils³:

- | | | |
|---|---|---|
| <input type="checkbox"/> Histosol (A1)
<input type="checkbox"/> Histic Epipedon (A2)
<input type="checkbox"/> Black Histic (A3)
<input type="checkbox"/> Hydrogen Sulfide (A4)
<input type="checkbox"/> Stratified Layers (A5)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)
<input type="checkbox"/> Depleted Below Dark Surface (A11)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Stripped Matrix (S6) | <input checked="" type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)
<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks) |
|---|---|---|
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

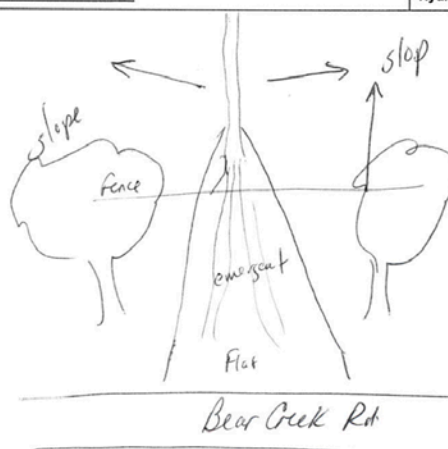
Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:



TVARAM Field Form Quantitative Rating

Site: Clinch River SML - Barge AreaRater(s): Pilarski, Hall / KunnDate: 04/22/2015

0	0
max 6 pts	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
☒ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

Timble GPS

12	12
max 14 pts	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7).
☐ MEDIUM. Buffers average 25 m to <50 m (82 ft to <164 ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☒ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

14	26
max 30 pts	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
☐ Other groundwater (3) [BR/CM (5)]
☒ Precipitation (1) [unless BR/CM primary source (5)]
☐ Seasonal/intermittent surface water (3)
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
☒ Between stream/lake and other human use (1)
☒ Part of wetland/upland (e.g., forest), complex (1)
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
☒ Regularly inundated/saturated (3) [BR/CM (4)]
☒ Seasonally inundated (2) [BR/CM (4)]
☒ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- ☐ ditch
☐ tile (including culvert)
☐ dike
☐ weir
☐ stormwater input
☐ point source (nonstormwater)
☐ filling/grading
☒ road bed/RR track
☐ dredging
☐ other _____

16	42
max 20 pts	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
☐ Recovered (3)
☐ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☒ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☐ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
☒ Recovered (6)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
☐ grazing
☐ clearcutting
☐ selective cutting
☐ farming
☐ toxic pollutants
☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ woody debris removal
☐ sedimentation
☐ dredging
☐ nutrient enrichment

42
subtotal this page

TVARAM Field Form Quantitative Rating

Site: Clinch River SME - Barge Area Rater(s): P. Larsen - Hall / Kennon Date: 04/22/2015

42
subtotal previous page

3 45
max 10 pts subtotal

3
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

- Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc.)
- 3 ☒ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m. sphagnum or other moss (5); muck, organic soil (layer) (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh; buttress, mulittrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe) G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality): <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8 53
max 20 pts subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- ☒ Aquatic bed
- ☒ Emergent 2
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen, Other

6b. Horizontal (plan view) interspersions. Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3) [BR/CM (5)]
- ☒ Moderately low (2) [BR/CM (3)] 3
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

6c. Coverage of invasive plants.

Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☒ Sparse 5-25% cover (-1) 1
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks 4
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre

[For BR/CM <0.04 ha (0.1 acre)]

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

Mudflat and Open Water Class Quality

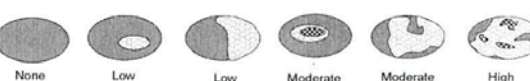
0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

53

GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.ch.us/dsai/401401.html>

Last revised 2005-04-29

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Clinch River smt - Barge / Hutto Area City/County: Roose County Sampling Date: 04/22/2015
 Applicant/Owner: Tennessee Valley Authority State: TN Sampling Point: Wetland E
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: No soil mapping available NWI classification: PSS1Hh
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No _____	
Remarks: <u>Category 3 - TJA RAM</u>		

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) _____ Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) _____ Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input checked="" type="checkbox"/> Iron Deposits (B5) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>24" ✓</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: <u>Fringes of embayment assoc. of perennial stream – unnamed – flowing into Clinch River</u> <u>Partially influenced by reservoir level</u> <u>TJA RAM – 68</u>		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

Tree Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
		= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)				
1.	<i>box penn.</i>			
2.	<i>Sally nipa</i>			
3.	<i>Cephaelis occidentalis</i>			
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		= Total Cover		
Herb Stratum (Plot size: _____)				
1.				
2.	<i>Arundinaria gigantea</i>			
3.	<i>Juncus effusus</i>			
4.	<i>Typha latifolia</i>			
5.	<i>Polygonum spp.</i>			
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
5.				
6.				
		= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Indicators for Problematic Hydric Soils³:

- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Hydric Soil Present? Yes _____ No _____

Remarks:



TVARAM Field Form Quantitative Rating

Site: CR SMC - Bayou Traffic Rater(s): Plarski-Hall/Kannon Date: 04/22/2015

3 3
max 6 pts. subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
☐ 7 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
☒ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

Trimble GPS unit

12 15
max 14 pts. subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

21 36
max 30 pts. subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
☐ Other groundwater (3) [BR/CM (5)]
☐ Precipitation (1) [unless BR/CM primary source (5)]
☐ Seasonal/intermittent surface water (3)
☒ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☒ >0.7 m (27.6 in.) (3)
☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☒ 100-year floodplain (1)
☒ Between stream/lake and other human use (1)
☐ Part of wetland/upland (e.g., forest), complex (1)
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
☒ Regularly inundated/saturated (3) [BR/CM (4)]
☐ Seasonally inundated (2) [BR/CM (4)]
☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- ☐ ditch ☐ point source (nonstormwater)
☐ tile (including culvert) ☐ filling/grading
☐ dike ☐ road bed/RR track
☐ weir ☐ dredging
☐ stormwater input ☐ other _____

14 50
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
☒ Recovered (3)
☐ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☐ Very good (6)
☒ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☐ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
☒ Recovered (6)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing ☐ shrub/sapling removal
☐ grazing ☐ herbaceous/aquatic bed removal
☐ clearcutting ☐ woody debris removal
☐ selective cutting ☐ sedimentation
☐ farming ☐ dredging
☐ toxic pollutants ☐ nutrient enrichment

50
subtotal this page

TVARAM Field Form Quantitative Rating

Site: CR SMP - Barge Pits Area Rater(s): Plaschke-Hall Date: 04/22/2015

50
subtotal previous page

0 50
max 10 pts subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

18 67
max 20 pts subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other

6b. Horizontal (plan view) interspersion. Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☒ Moderate (3) [BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

6c. Coverage of invasive plants. Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography. Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre

[For BR/CM <0.04 ha (0.1 acre)]

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

68

GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.ch.us/dsw/401/401.html>

Last revised 2005-04-29

