Report of Jurisdictional Waters Assessment
Manufacturers Road Site
Chattanooga, Tennessee
S&ME Project No. 4181-16-068

Prepared for:
Wingfield Scale Company, Inc.
2205 S. Holtzclaw Avenue
Chattanooga, TN 37404

Prepared by:
S&ME, Inc.
4291 Highway 58, Ste 101
Chattanooga, TN 37416

December 13, 2016

December 13, 2016

Wingfield Scale Company, Inc.
2205 South Holtzclaw Avenue
Chattanooga, TN 37404

Attention: Mr. Joseph Wingfield

Reference: **Report of Jurisdictional Waters Assessment**
Manufacturers Road Site
408, 410, 418, and Western Portion of 100 Manufacturers Road
Chattanooga, Tennessee
S&ME Project No. 4181-16-068

Dear Mr. Wingfield:

S&ME, Inc. (S&ME) is pleased to submit this report of jurisdictional waters assessment for the above referenced project site in Chattanooga, Tennessee. The work was conducted in general conformance with the scope of services outlined in S&ME Proposal No. 41-1600689, dated November 16, 2016, and authorized by you on November 21, 2016. S&ME appreciates the opportunity to provide services for this project. If you have any questions, please call.

Sincerely,

S&ME, Inc.

F. Barry Burnette
Staff Scientist

Kristy Smedley, MS, QHP
Senior Scientist
TNQHP 1021-TN11

Cc: Ms. Donna A. Shepherd, A.D. Engineering Services, Inc.

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Appendices

1.0 Project Information

The project site is located on the south side of Manufacturers Road and encompasses approximately 8 acres of land. The site is comprised of three separate, contiguous parcels, and a portion of a fourth. According to the Hamilton County GIS website, project site parcels included Parcel 135F H 007.04 (418 Manufacturers Road (1.34 acres)); Parcel 135F H 007 (410 Manufacturers Road (1.4 acres)); Parcel 135F H 007.05 (408 Manufacturers Road (2.14 acres)); and the western portion of Parcel 135F H 004 (100 Manufacturers Road (about 3 acres)). Our understanding of the project is based on information provided by Ms. Donna Shepherd of A.D. Engineering Services to Ms. Kristy Smedley of S&ME via email on November 14, 2016. S&ME was requested to evaluate the project site for potential jurisdictional waters to assist in the evaluation of the site for potential future use and/or development.

2.0 Methodology

Jurisdictional waters of the U.S., including wetlands, are defined by 33 CFR Part 328.3 and are protected by Section 404 of the Clean Water Act (33 USC 1344), which is administered and enforced by the U.S. Army Corps of Engineers (USACE). The Tennessee Department of Environmental and Conservation-Division of Water Resources (TDEC-DWR) has jurisdiction over waters of the state. The wetland assessment was performed using the Routine On-Site Determination Method as defined in the Corps of Engineers *1987 Wetlands Delineation Manual* and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region.*[1] This technique uses a multi-parameter approach, which requires positive evidence of three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. Areas exhibiting all three wetland characteristics, as well as surface waters, are considered jurisdictional.

Our assessment for the possible occurrence of jurisdictional waters, including wetlands, within the project site consisted of using a combination of in-house research and field reconnaissance. In-house research included: 1) a review of the U.S. Geological Survey 7.5-minute topographic map of the Chattanooga, Tennessee quadrangle (dated 1969, photo revised 1976); 2) review of the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for the above-referenced quadrangle (reviewed online at http://wetlandsfws.er.usgs.gov/); 3) review of the web soil survey for Hamilton County, Tennessee published by the US Department of Agriculture (USDA), Natural Resources Conservation Service; and 4) review of a 2014 aerial photograph of the site (obtained from Google Earth®). Subsequent to the in-house review, jurisdictional waters of the U.S., including wetlands, were assessed in the field employing the USACE methodology referenced above.

We evaluated drainage features according to the TDEC Guidance for Making Hydrologic Determinations, Version 1.4. The procedures outlined in this guidance are intended to be applied to drainage features that could be considered either a wet-weather conveyance (WWC) or a stream. A score of less than 19 indicates the feature meets the definition of a wet-weather conveyance and a score of 19 or greater indicates the feature is a stream. Typically, features considered to be a stream by TDEC would be

[1] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers, Washington, D.C., 100 pp. plus appendices, and U.S. Army Corps of Engineers. 2012. *Final Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-10-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

considered an intermittent or perennial stream by the USACE. Copies of the TDEC Hydrologic Determination Field Data Sheets for the observed features are included in Appendix III. Our opinion of the stream type for both agencies is included in Section 3.2 below.

3.0 Results of Jurisdictional Waters Assessment

S&ME evaluated the soils, vegetation, and hydrology within two suspect areas that were located within the project site. The results are summarized in the sections below, and the features identified correspond to the areas depicted on Figure 4 in Appendix I. S&ME conducted the field assessment on December 2, 2016, which was about 46 hours after the most recent rain event of approximately 4 inches that occurred on November 30, 2016.

3.1 In-House Review

No wetlands are depicted within the project site on NWI map reviewed. The Tennessee River is located on the southern boundary of the project site. An unnamed tributary of the Tennessee River is depicted in the project site on the topographic map reviewed. The soil survey information reviewed depicts the subject property as being underlain by the Arents (ArB) and Enders-Urban land complex (2 to 12 percent slopes) (EhC). Both Arents and Enders-Urban land complex soils are characterized as soils that have been altered or covered during development so that it is not feasible to classify soil types. The 2014 aerial photograph reviewed indicates that the eastern portion of the project site is undeveloped, wooded land, and the western portion is grassed field. What appears to be an area of standing water is visible in the aerial photograph in the western portion of the site. The area of standing water appears to connect to the Tennessee River, on the southern boundary of the site. Figure 1 in Appendix I depicts the topographic map that includes the site and vicinity. The NWI map for the project site is included in Appendix I as Figure 2. Figure 3 in Appendix I is the USDA Soil Survey map depicting the project site.

3.2 Field Observations

3.2.1 Stream Assessment

On December 2, 2016, an S&ME Qualified Hydrologic Professional (QHP), trained in the TDEC Guidance for Making Hydrologic Determinations, performed the evaluation of the site to identify and characterize on-site drainage features. The following drainage features were observed.

3.2.1.1 S1 (WWC / Ephemeral Stream)

A drainage feature was observed in the northeastern section of the wooded portion of the project site, behind the north-adjoining, multi-tenant, residential property. The feature continued in a southeasterly direction for approximately 145 feet before entering another drainage feature (S3-B). Water was observed in one pooled area along the reach; no flowing water or other areas of standing water were observed in this feature. This drainage feature scored a 10.5 on the TDEC Hydrologic Determination Field Data Sheet (included in Appendix B) and is considered to be a WWC. In our opinion, this feature would also be considered an ephemeral stream by the USACE. The feature is depicted on Figure 4 as S1, and in photograph 1.

3.2.1.2 S2 (WWC / Ephemeral Stream)

A drainage feature was observed beginning at the northern boundary of the subject site, behind the north-adjoining, multi-tenant, residential property. The feature begins on the north-adjoining property and is concrete-lined as it enters the subject site. The drainage continues onto the subject site for approximately 60 feet until entering a wetland area (Wetland 1). For the next approximately 50 feet through Wetland 1, it appeared to continue as a broad sheet flow drainage with no defined channel, until reaching another drainage feature (S3-B) on the west side of the wetland area. No flowing or standing water was observed in this feature at the time of our site visit. This drainage feature scored a 6.5 on the TDEC Hydrologic Determination Field Data Sheet (included in Appendix B) and is considered to be a WWC. In our opinion, this feature would also be considered an ephemeral stream by the USACE. The feature is depicted on Figure 4 as S2, and in photograph 2.

3.2.1.3 S3-A (WWC / Intermittent Stream)

Another drainage feature was observed beginning at the northern boundary of the subject site, behind the north-adjoining, multi-tenant, residential property, just west of S2 (discussed above). It was designated as S3-A to distinguish it from the downstream portion described below as S3-B. At the time of our site visit, S3-A was observed flowing from a subsurface seep on the subject site. The feature proceeded within a channel generally to the south from the seep for approximately 60 feet south until entering a wetland area (Wetland 1), where it dissipated and appeared to return to the subsurface. Evidence of a broader sheet flow drainage through the wetland area with no defined channel was observed. This portion of the drainage feature scored a 15.5 on the TDEC Hydrologic Determination Field Data Sheet (included in Appendix B) and is considered to be a WWC. In our opinion, this feature would also be considered an intermittent stream by the USACE. The feature is depicted on Figure 4 as S3-A, and in photographs 3 and 4.

3.2.1.4 S3-B (Stream / Intermittent Stream)

This portion of S3 was observed beginning at a pool on the west side of a wetland area was interpreted to be a continuation of S3-A. Flowing water was observed in this portion of the feature at the time of our site visit. The stream proceeded generally to the southwest for approximately 130 feet before entering another stream (S4, discussed below). S3-B scored a 24 on the TDEC Hydrologic Determination Field Data Sheet (included in Appendix B) and is considered to be a Stream. In our opinion, this feature would also be considered an intermittent stream by the USACE. The feature is depicted on Figure 4 as S3-B, and in photographs 5 through 7.

3.2.1.5 S4 (Stream / Intermittent/Perennial Stream)

This stream enters the subject site at a culvert that receives water from the adjoining eastern property occupied by a constructed water feature at Renaissance Park. This stream is depicted as a solid blue line on the topographic map and is evident in the aerial photographs reviewed (see Section 3.1). The reviewed topographic map, which is dated prior to construction of the adjoining property water feature, depicts the feature as an unnamed tributary/back water of the Tennessee River. The stream is approximately 20 feet wide on the subject site and was flowing at the time of our site visit. It continues from the eastern boundary of the subject site approximately 280 feet west, before turning generally to the south for approximately 365 feet before entering the Tennessee River. Water levels in the southern approxaitemly 365 feet appeared to match Tennessee River water levels. The TDEC Hydrologic

Determination Field Data Sheet (included in Appendix B) indicates the presence of fish as a Primary Field Indicator of a stream. Several sunfish (*Lepomis* sp.) were observed during site reconnaissance activities. Based on the presence of fish other than *Gambusia* sp., the feature would be considered a Stream by the TDEC, and an intermittent or perennial stream by the USACE. The feature is depicted on Figure 4 as S4, and in photographs 7 through 9.

3.2.1.6 S5 (WWC / Ephemeral Stream)

A drainage feature was observed on the west side of the wooded portion of the subject site, beginning at the drain pipe from beneath the adjoining gravel drive. It continued approximately 50 feet to the east until entering S4 (discussed above). No flowing water or areas of standing water were observed in this feature at the time of our site visit. This drainage feature scored an 8 on the TDEC Hydrologic Determination Field Data Sheet (included in Appendix B) and is considered to be a WWC. In our opinion, this feature would also be considered an ephemeral stream by the USACE. The feature is depicted on Figure 3 as S5, and in photograph 10.

3.2.2 Wetland Assessment and Delineation

According to the 1987 Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (April 2012), an area must meet three criteria to be considered a jurisdictional wetland. The three criteria are hydric soils, hydrophytic vegetation, and wetland hydrology. If any one of the three criteria is absent, the area is not considered a jurisdictional wetland.

S&ME performed a field review of the project site, investigating low-lying areas that may have the potential for extended periods of saturation, as well as areas shown on the topographic map and aerial photographs that appeared to contain standing water, saturation, or stormwater conveyances. During the course of our field services, S&ME identified one area of potential jurisdictional wetlands as discussed below (see Figure 4).

3.2.2.1 Wetland 1

This low-lying area contained several indicators of hydrology during our site visit, including surface water, saturation, water stained leaves, and drainage patterns. The wetland area obtains hydrologic input from topographically higher areas to the north and northeast, along with contributions from S2 and S3-A (discussed above).

Soils were evaluated utilizing the Munsell soil color chart and exhibited hydric characteristics that met the definition of the F3- Depleted Matrix hydric soil indicator. The upper six inches of the soil within the wetland generally possessed a matrix chroma and value of 2.5Y 3/2 with redoximorphic features of 5YR 3/4.

Within the wetland, the dominant hydrophytic vegetation observed included box elder (*Acer negundo*), smartweed (*Persicaria hydropiperoides*), and giant cane (*Arundinaria gigantea*). A detailed description of the wetland area within a specific data plot, along with a corresponding upland data form, can be found in the attached USACE Routine Wetland Determination Data Forms. We understand that a certified land surveyor will be recording the locations of the wetland boundaries delineated by S&ME.

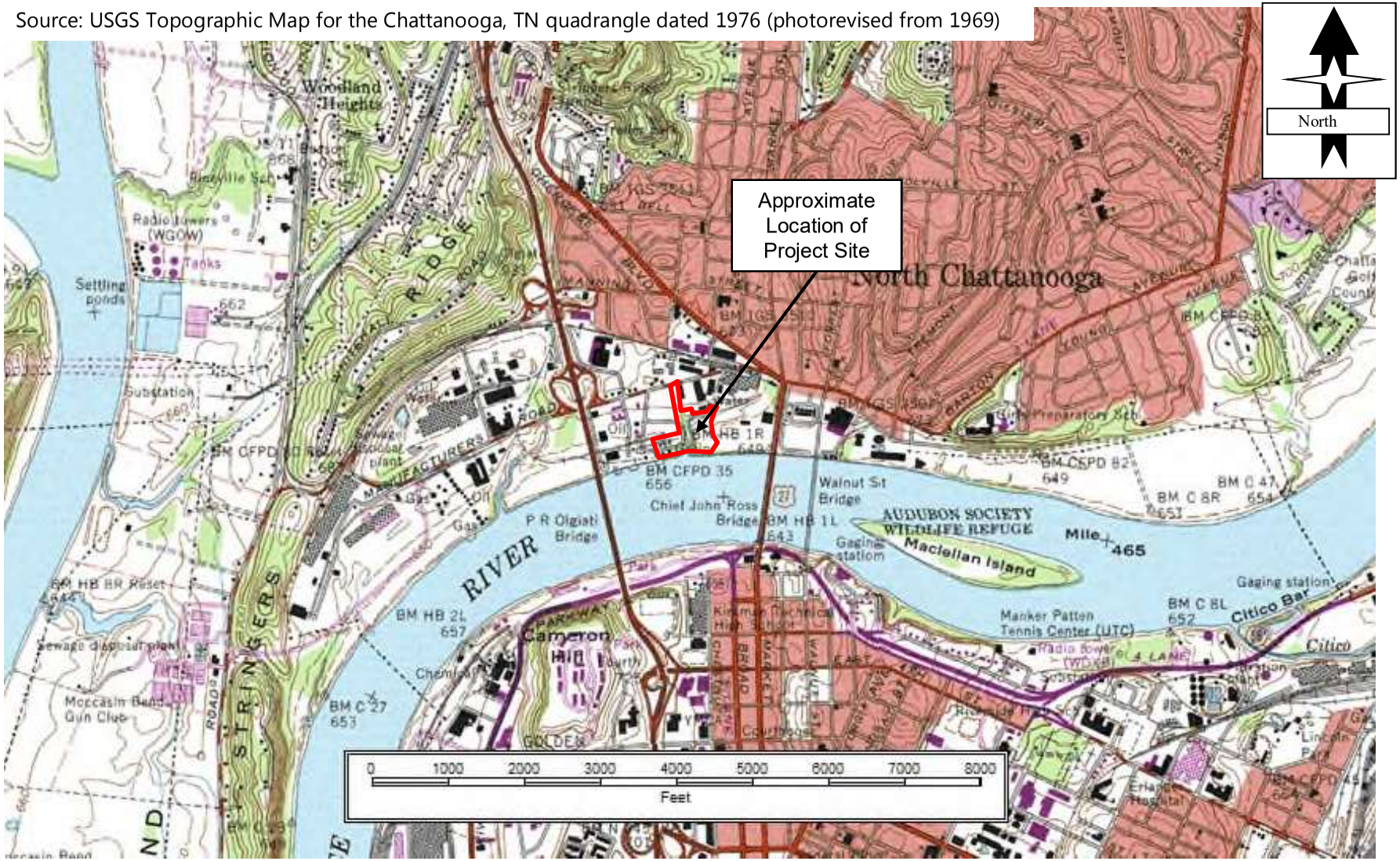
4.0 Conclusions and Recommendations

S&ME conducted a jurisdictional waters assessment on the project site and identified a one Stream/intermittent or perennial stream, one Stream/intermittent stream, one WWC/intermittent stream, three WWC/ephemeral streams, and one wetland. All wetland delineations and stream determinations are preliminary until verified by the USACE and TDEC-DWR and should be used for planning purposes only until the verification is complete. If future project plans propose to impact the identified features, written agency concurrence will be a required component of the permit applications. Following your approval, S&ME will submit this report along with a Jurisdictional Determination (JD) Request form to the USACE concerning potential jurisdictional Water of the United States. We will copy the TDEC-DWR to request concurrence and document the presence of Waters of the State.

Appendices

Appendix I –Figures

Source: USGS Topographic Map for the Chattanooga, TN quadrangle dated 1976 (photorevised from 1969)



Scale as shown Drawn By: BB Checked By: KS Date: 12/5/16	S&ME	**Topographic Site Plan** Manufacturers Road Site Manufacturers Road Chattanooga, Hamilton County, Tennessee	Figure 1

U.S. Fish and Wildlife Service

National Wetlands Inventory

Nov 30, 2016

Wetlands

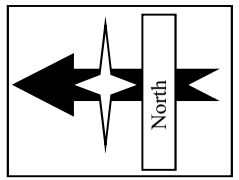
- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

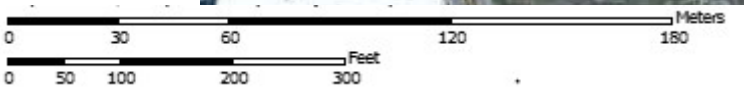
North

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Scale As Shown Drawn By: BB Checked By: KS Date: 12/5/16	S&ME	**USFWS National Wetlands Inventory Map** Manufacturers Road Site Manufacturers Road Chattanooga, Hamilton County, Tennessee	Figure 2

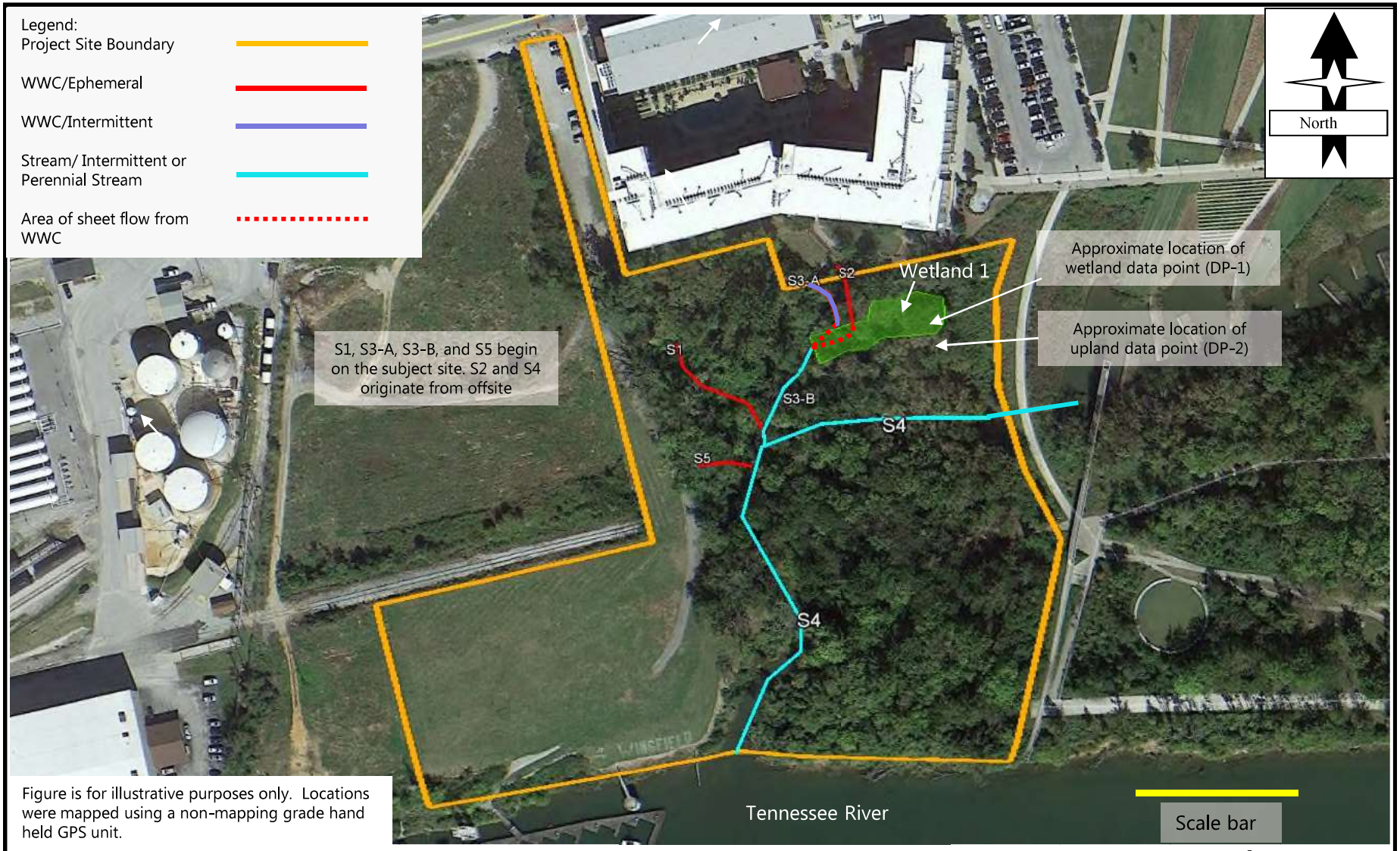
Map Unit Symbol	Map Unit Name
ArB	Arents
EhC	Enders-Urban land complex, 2 to 12 percent slopes





USDA Natural Resources Conservation Service

Scale As Shown Drawn By: BB Checked By: KS Date: 12/5/16	S&ME	**USDA Web Soil Survey Map** Manufacturers Road Site Manufacturers Road Chattanooga, Hamilton County, Tennessee	Figure 3



Scale Bar ~ 200	S&ME	**Overview of Findings** Manufacturers Road Site Manufacturers Road Chattanooga, Hamilton County, Tennessee	Figure 4
Drawn By: BB			
Checked By: KS			
Date: 12/7/16			

Appendix II – Photographs

Date: 12/2/2016

Photographer: KLS

1	**Location / Orientation**	Northwestern portion of the wooded portion of the project site, facing north and upstream
	Remarks	Typical view of drainage feature S1.

Date: 12/2/2016

Photographer: KLS

2	**Location / Orientation**	View of location where S2 enters site, facing north and upstream
	Remarks	Typical view concrete area at start of feature S2.

Date: 12/2/2016

Photographer: KLS

3	**Location / Orientation**	View of location where S3-A begins onsite near northern boundary.
	Remarks	Water flowing from seep at start of feature.

Date: 12/2/2016

Photographer: KLS

4	**Location / Orientation**	At location where S3-A enters onsite wetland, facing north and upstream
	Remarks	Typical view of where S3-A enters wetland.

Date: 12/2/2016

Photographer: KLS

5	**Location / Orientation**	West side of Wetland 1, facing east
	Remarks	View of S3-B from pool where subsurface flow reemerges and continues in channel

Date: 12/2/2016

Photographer: KLS

6	**Location / Orientation**	At S3-B, facing east and upstream.
	Remarks	Typical view of S3-B.

Date: 12/2/2016

Photographer: KLS

7	**Location / Orientation**	At location where S3-B enters perennial stream S4 onsite.
	Remarks	Typical view of S4.

Date: 12/2/2016

Photographer: KLS

8	**Location / Orientation**	S4 at east side of site, facing east and upstream.
	Remarks	Typical view of upstream portion of S4; culvert where S4 enters site is evident in background.

Date: 12/2/2016

Photographer: KLS

9	**Location / Orientation**	S4 at south side of site, facing south and downstream.
	Remarks	View of S4 prior to entering Tennessee River.

Date: 12/2/2016

Photographer: KLS

10	**Location / Orientation**	S5 at west side of wooded portion of project site, facing east and downstream.
	Remarks	View of culvert where S5 begins onsite. Feature continues approximately 50 feet before entering S4.

Appendix III - Field Data Forms

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Hamilton	Named Waterbody: n/a	Date/Time: 12/2/16; 11:00 am
Assessors/Affiliation: KS & BB of S&ME, Inc.		Project ID : S1
Site Name/Description: Manufacturers Road Site		
Site Location: 408 Manufacturers Road		
USGS quad: Chattanooga	HUC (12 digit): 06020001001T_0200	Lat/Long: 35.061242, -85.312965
Previous Rainfall (7-days) : November 30th (4.01 inches)		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data :		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Arents and Enders-Urban land complex Source: USDA Web Soil Survey		
Surrounding Land Use : Commercial / Industrial / Multi-tenant residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 10.5

Justification / Notes : Slight historical alteration to natural channel morphology due to surrounding development increasing runoff amounts and locations.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	0	(1)	2	3
3. In-channel structure: riffle-pool sequences	0	(1)	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	0	(0. 5)	1	1.5
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. At least second order channel on existing USGS or NRCS map	(No = 0)		Yes = 3	

B. Hydrology (Subtotal = 2.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain **	0	(1)	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	(1)	1.5
19. Hydric soils in stream bed or sides of channel	(No = 0)		Yes = 1.5	

C. Biology (Subtotal = 2)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1] **N/A**	3	2	1	0
21. Rooted plants in channel [1]	3	(2)	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 10.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : **- Approximately 46 Hours since most recent rain.

#20. Channel incised below root bearing zone.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Hamilton	Named Waterbody: n/a	Date/Time: 12/2/16; 12:10 pm
Assessors/Affiliation: KS & BB of S&ME, Inc.		Project ID : S2
Site Name/Description: Manufacturers Road Site		
Site Location: 408 Manufacturers Road		
USGS quad: Chattanooga	HUC (12 digit): 06020001001T_0200	Lat/Long: 35.061541, -85.312437
Previous Rainfall (7-days) : November 30th (4.01 inches)		
Precipitation this Season vs. Normal : very wet wet average dry drought unknown Source of recent & seasonal precip data : Weather Underground		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Arents and Enders-Urban land complex Source: USDA Web Soil Survey		
Surrounding Land Use : Commercial / Industrial / Multi-tenant residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 6.5

Justification / Notes : Historical alteration to natural channel morphology due to surrounding development increasing runoff amounts and locations.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.5)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0. 5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain **	0	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	2	1	0
21. Rooted plants in channel [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel [2]	0	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :#10 – observed headcut was concrete in stormwater runnoff channel from adjoining property.

** - Approximately 46 Hours since most recent rain.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Hamilton	Named Waterbody: n/a	Date/Time: 12/2/16; 12:25 pm
Assessors/Affiliation: KS & BB of S&ME, Inc.		Project ID : S3A
Site Name/Description: Manufacturers Road Site		
Site Location: 408 Manufacturers Road		
USGS quad: Chattanooga	HUC (12 digit): 06020001001T_0200	Lat/Long: 35.061380, -85.312484
Previous Rainfall (7-days) : November 30th (4.01 inches)		
Precipitation this Season vs. Normal : very wet wet average dry (drought) unknown Source of recent & seasonal precip data : Weather Underground website		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Arents and Enders-Urban land complex Source: USDA Web Soil Survey		
Surrounding Land Use : Commercial / Industrial / Multi-tenant residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight (Absent)		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 15.5

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	(0)	1	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0. 5	1	1.5
12. Natural valley or drainageway	(0)	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	(No = 0)		Yes = 3	

B. Hydrology (Subtotal = 7.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	(3)
15. Water in channel and >48 hours since sig. rain **	0	1	2	(3)
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	(1)	1.5
19. Hydric soils in stream bed or sides of channel	(No = 0)		Yes = 1.5	

C. Biology (Subtotal = 5)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	3	(2)	1	0
21. Rooted plants in channel [1]	(3)	2	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :#14 – observed subsurface flow from hole at start of feature.

** - Approximately 46 Hours since most recent rain.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Hamilton	Named Waterbody: n/a	Date/Time: 12/2/16; 12:40 pm
Assessors/Affiliation: KS & BB of S&ME, Inc.		Project ID : S3B
Site Name/Description: Manufacturers Road Site		
Site Location: 408 Manufacturers Road		
USGS quad: Chattanooga	HUC (12 digit): 06020001001T_0200	Lat/Long: 35.061293, -85.312583
Previous Rainfall (7-days) : November 30th (4.01 inches)		
Precipitation this Season vs. Normal : very wet wet average dry (drought) unknown Source of recent & seasonal precip data : Weather Underground website		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Arents and Enders-Urban land complex Source: USDA Web Soil Survey		
Surrounding Land Use : Commercial / Industrial / Multi-tenant residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight (Absent)		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 24

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	(3)
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	(2)	3
4. Sorting of soil textures or other substrate	0	1	(2)	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	0	1	2	(3)
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0. 5	1	1.5
12. Natural valley or drainageway	(0)	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	(No = 0)		Yes = 3	

B. Hydrology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	(3)
15. Water in channel and >48 hours since sig. rain **	0	1	2	(3)
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in stream bed or sides of channel	(No = 0)		Yes = 1.5	

C. Biology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1]	(3)	2	1	0
21. Rooted plants in channel [1]	(3)	2	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 24

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : ** - Approximately 46 hours since most recent rain.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Hamilton	Named Waterbody: n/a	Date/Time: 12/2/16; 2:10 pm
Assessors/Affiliation: KS & BB of S&ME, Inc.		Project ID : S4
Site Name/Description: Manufacturers Road Site		
Site Location: 408 Manufacturers Road		
USGS quad: Chattanooga	HUC (12 digit): 06020001001T_0200	Lat/Long: 35.061002, -85.312724
Previous Rainfall (7-days) : November 30th (4.01 inches)		
Precipitation this Season vs. Normal : very wet wet average dry (drought) unknown Source of recent & seasonal precip data : Weather Underground website		
Watershed Size :	Photos: (Y) or N (circle) Number :	
Soil Type(s) / Geology : Arents and Enders-Urban land complex Source: USDA Web Soil Survey		
Surrounding Land Use : Commercial / Industrial / Multi-tenant residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)		(Stream)
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) =

Stream connects directly to Tennessee River and fluctuates with river flow regime. Stream Flows from constructed water feature at Renaissance Park on adjoining property.

Lepomis sp. observed in stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: Hamilton	Named Waterbody: n/a	Date/Time: 12/2/16; 3:00 pm
Assessors/Affiliation: KS & BB of S&ME, Inc.		Project ID : S5
Site Name/Description: Manufacturers Road Site		
Site Location: 408 Manufacturers Road		
USGS quad: Chattanooga	HUC (12 digit): 06020001001T_0200	Lat/Long: 35.060991, -85.312909
Previous Rainfall (7-days) : November 30th (4.01 inches)		
Precipitation this Season vs. Normal : very wet wet average dry (drought) unknown Source of recent & seasonal precip data : Weather Underground website		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology : Arents and Enders-Urban land complex Source: USDA Web Soil Survey		
Surrounding Land Use : Commercial / Industrial / Multi-tenant residential		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate (Slight) Absent		

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	N/A	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE : If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 8

Justification / Notes : Alteration to natural channel morphology due to periodic high runoff amounts from culvert from adjoining property deeply incising channel at culvert outfall.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	(3)
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	(0)	1	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0. 5	1	1.5
12. Natural valley or drainageway	(0)	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	(No = 0)		Yes = 3	

B. Hydrology (Subtotal = 1)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain **	(0)	1	2	3
16. Leaf litter in channel (January – September) **N/A**	1.5	1	0.5	0
17. Sediment on plants or on debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (wrack lines)	0	(0.5)	1	1.5
19. Hydric soils in stream bed or sides of channel	(No = 0)		Yes = 1.5	

C. Biology (Subtotal = 3)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel [1] **N/A**	3	2	1	0
21. Rooted plants in channel [1]	(3)	2	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macrobenthos (record type & abundance)	(0)	1	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28.Wetland plants in channel [2]	(0)	0.5	1	2

[1] Focus is on the presence of upland plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes ** - Approximately 46 Hours since most recent rain.

#20. Channel incised below root bearing zone.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Manufacturers Road Site City/County: Chattanooga / Hamilton Sampling Date: 12/2/16

Applicant/Owner: _____ State: TN Sampling Point: W1/DP-1

Investigator(s): K. Smedley & B. Burnette of S&ME, Inc. Section, Township, Range: _____

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1%

Subregion (LRR or MLRA): LRR Lat: 35.061440 Long: -85.312054 Datum: NAD83

Soil Map Unit Name: Arents (ArB) and Enders-Urban land complex (EhC) NWI classification: N/A

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 ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

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): 1"
Water Table Present?	Yes ✓	No _____	Depth (inches): 12"
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 1"

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

Surface water observed within wetland area, approximately 20 feet from data point. Water observed to fill soil pit to 12".

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W1/DP-1

Tree Stratum (Plot size: 15 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	30	YES	FACW
2. Celtis occidentalis	30	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 feet)			
1. Acer negundo	6	YES	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	6	= Total Cover	

Herb Stratum (Plot size: 15 feet)			
1. Persicaria hydropiperoides	40	YES	OBL
2. Arundinaria gigantea	40	YES	FACW
3. Carex frankii	20	NO	OBL
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (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:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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.)

SOIL

Sampling Point: W1/DP-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/3	100						Organic material
1-3	10YR 4/4	100					silty clay	
3-6	2.5Y 3/2	75	5YR 3/4	25	D	PL	silty clay	
6-10+	2.5Y 4/2	75	10YR 4/6	25	D	PL	silty clay	

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

Hydric Soil Indicators:

- ___ 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)
- ___ 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)**

Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Manufacturers Road Site City/County: Chattanooga / Hamilton Sampling Date: 12/2/16

Applicant/Owner: _____ State: TN Sampling Point: W1/DP-2

Investigator(s): K. Smedley & B. Burnette of S&ME, Inc. Section, Township, Range: _____

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1%

Subregion (LRR or MLRA): LRR Lat: 35.061370 Long: -85.312005 Datum: NAD83

Soil Map Unit Name: Arents (ArB) and Enders-Urban land complex (EhC) NWI classification: N/A

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 _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

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? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W1/DP-2

Tree Stratum (Plot size: 15 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	60	YES	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. Ligustrum sinense	10	YES	FACU
2. Lonicera maackii	7	YES	NI
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	17	= Total Cover	
Herb Stratum (Plot size: 15 feet)			
1. Arundinaria gigantea	50	YES	FACW
2. Smilax glauca	30	YES	FACU
3. Ligustrum sinense	15	NO	FACU
4. Euonymus fortunei	15	NO	NI
5. Lonicera maackii	5	NO	NI
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	115	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (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:	0 (A)		0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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.)

SOIL

Sampling Point: W1/DP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100						
2-7	10YR 4/3	100						
7-10+	10YR 4/4	100						

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

Hydric Soil Indicators:

- ___ 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)
- ___ 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)**

Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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: