



June 23, 2017

AOA-5327

Brad Sturman
Sturman Architects, Inc.
9-103rd Ave. NW, Suite 203
Bellevue, WA 98004

**SUBJECT: Stream Delineation and Buffer Reduction for Platau Residence
8316 Avalon Drive, Mercer Island, WA (Parcel 032110-0290)
Revised Per Peer Review Comments (City #CAO17-002)**

Dear Brad:

We have revised this critical areas study to incorporate the comments presented in the May 9, 2017 memorandum from ESA to Andrew Leon, Planner with the City of Mercer Island.

Background

On December 6, 2016 I conducted an initial wetland and stream reconnaissance on the subject property utilizing the methodology outlined in the May 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*. The site is currently developed with an existing single-family residence and associated maintained yard.

Although no wetlands were identified on the site during the site review, one stream (Stream 1) was observed flowing from north to south through the northern portion of the property. The ordinary high water of this stream was delineated during the field investigation and subsequently surveyed.

1.0 EXISTING CRITICAL AREAS

Stream 1 is located within a well-defined channel, much of which consists of historically rocked banks. Runoff within the stream flows south through a landscaped yard and drains through a culvert under the existing access drive to the residence before entering a small landscape pond located along the east property line. Runoff from the pond continues east under the driveway for the adjacent residence to the east.

Vegetation within the riparian corridor of the stream consists of a mix of native species and a variety of ornamental plantings. Trees included big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), and willow (*Salix* sp.), with many of the trees appearing to be in poor health due to periodic topping and trunk sprouting. Shrubs and groundcover included Pacific ninebark (*Physocarpus capitatus*), sword fern (*Polystichum munitum*), English ivy (*Hedera helix*), and bamboo.

Stream 1 does not contain fish habitat but does likely convey perennial flows. Watercourses in the City of Mercer Island that contain perennial flows without fish habitat are considered Type 2 watercourses per MICC 19.07.070.A. Type 2 watercourses require a standard buffer of 50 feet from the ordinary high water per MICC 19.070.B.1. This standard buffer can be reduced to a minimum of 25 feet with the implementation of a buffer enhancement plan that increases the functions of the riparian corridor over existing conditions per MICC 19.07.070.B.2.

1.1 Two Small Areas Adjacent Stream per ESA

ESA recommended reviewing 2 small areas adjacent the stream as potential wetlands or for inclusion within the ordinary high water of the stream. On May 23, 2017 I conducted a site review of these 2 areas to document vegetation, soil, and hydrologic conditions. **Attachment A** contains data sheets at each of these locations.

Both of the areas consists of gently sloped terraces located along the rockied stream channel and have likely been disturbed through historic grading. Vegetation within the area along the east side of the stream was dominated by field horsetail (*Equisetum arvense*) (FAC) and a smaller component of nipplewort (*Lapsana communis*)(FACU), with much of the area consisting of bare ground as a result of landscape maintenance. The western area contained a large planted laurel shrub as well as field horsetail, nipplewort, and a small amount of fringed willow-herb (*Epilobium ciliatum*)(FACW) adjacent the stream.

Soils within both of the areas were dark (typically 10YR 2/1 or 3/1) with faint redoximorphic features observed in places. No standing water or seepage was observed in either test hole at the time of the May 23rd site review, although soils were wet in the eastern area within a sand lense at 16 inches below the surface. Due to: 1) the very small size, 2) lack of clear hydrophytic plant community, and 3) potential for relic soil conditions associated with historic grading, the 2 areas were re-delineated and included within the ordinary high water of the stream as suggested as an option within the ESA letter. The site plan has been modified such that the 25-foot minimum enhanced buffer extends from the newly delineated areas.

2.0 PROPOSED PROJECT

The standard 50-foot stream buffer currently extends into the existing garage and adjacent gravel parking area for the residence (**Photo 1**). The proposed project consists of the re-development and expansion of the existing residence and garage. As part of the expansion, 135 s.f. of new structure would be added within the standard 50-foot buffer. No new structure area would be added within the minimum 25-foot buffer. Since the area of proposed expansion is located over existing gravel that does not currently provide any functional benefit to the riparian corridor, there would be no loss of stream buffer function from the expansion project.

In addition to the expansion project, an existing non-native, invasive Portugal laurel tree will be removed. All the other topped native trees will remain, per City recommendations (see tree legend on **Drawing W-1**).

3.0 PROPOSED BUFFER MITIGATION

Due to the degraded condition of the existing buffer, the proposed project would utilize mitigation option 19.07.070.B.2.b.iii to allow for a buffer reduction from 50 to 25 feet minimum to accommodate the minor expansion. Under the proposed project, all of the degraded vegetated portions of the watercourse buffer would be enhanced by the removal of invasive weeds and re-planting a variety of native tree, shrub, and groundcover species. In addition, that portion of the existing gravel parking area located within 25 feet of the OHW of the stream will be restored by removing the gravel and planting with native trees and shrubs.

As part of the enhancement measures, a small, 30" wide cedar chip path is proposed to be located in the buffer for maintenance access to the plantings and passive access to the stream by the property owners. A rock bridge already exists and will be used for trail access across the stream. Allowing the property owners specific access points into the buffer allows better success of maintenance of the plantings overtime, ease in invasive removal and creates a connection to the stream as a part of the larger property thus increasing stewardship of the stream and the buffer.

The proposed plantings have been designed to increase the plant species and structural diversity within the buffer and to provide physical and visual screening to the watercourse from the residence. Increasing the plant species and structural diversity within the buffer would also increase the wildlife habitat of the area over current conditions.

3.1 Goal, Objective, and Performance Standard for Enhancement Area

The primary goal of the enhancement plan is to restore the watercourse buffer with native vegetation. To meet this goal, the following objectives and performance standards have been incorporated into the design of the plan:

Objective A: Increase the structural and plant species diversity within the enhancement area.

Performance Standard: At the end of the five-year monitoring period, the enhancement area will contain at least fifteen native plant species. In addition, there will be 100% survival of all woody planted species throughout the enhancement area at the end of the first year of planting. Following Years 2 through 5, success will be based on an 80% survival rate.

Objective B: Limit the amount of invasive and exotic species within the enhancement area.

Performance Standard: After installation and at the end of the fifth year after planting, exotic and invasive plant species will be maintained at levels below 10% total cover in all planted areas. These species include, but are not limited to, Himalayan and evergreen blackberry, reed canarygrass, purple loosestrife, morning glory, Japanese knotweed, English ivy, hedge bindweed, English holly, and creeping nightshade.

3.2 Monitoring Methodology

The monitoring program will be conducted for a period of five years, with annual reports submitted to the City of Mercer Island.

Photo-points will be established from which photographs will be taken throughout the monitoring period. These photographs will document general appearance and progress in plant community establishment in the enhancement area. Review of the photos over time will provide a visual representation of success of the plan.

4.0 MAINTENANCE PLAN

Maintenance will be conducted on a routine, year round basis. Additional maintenance needs will be identified and addressed following a twice-yearly maintenance review. Contingency measures and remedial action on the site shall be implemented on an as-needed basis at the direction of the consultant or the owner. Tall grasses and weeds shall be removed at the base of plants to prevent engulfment. Weed control should be performed by hand removal.

5.0 CONTINGENCY PLAN

All dead plants will be replaced with the same species or an approved substitute species that meets the goal of the enhancement plan. Plant material shall meet the same specifications as originally-installed material. Replanting will not occur until after reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.). Replanting shall be completed under the direction of the consultant, City of Mercer Island, or the owner.

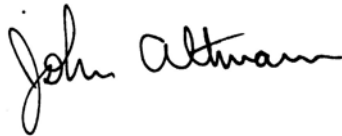
6.0 AS-BUILT PLAN

Following completion of construction activities, an as-built plan for the enhancement area will be provided to the City of Mercer Island. The plan will identify and describe any changes in relation to the original approved plan.

If you have any questions, please give me a call.

Sincerely,

ALTMANN OLIVER ASSOCIATES, LLC



John Altmann
Ecologist



Photo 1: View of existing garage within buffer proposed for expansion.

ATTACHMENT A

DATA SHEETS

TP # 1 EAST SIDE OF STREAM
(INCLUDED WITHIN OHW OF STREAM)

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 8316 AVALON DR. City/County: MERCER ISLAND Sampling Date: 05/23/17
 Applicant/Owner: PLATOU State: WA Sampling Point: TP 1
 Investigator(s): ALTMANN Section, Township, Range: SEC 31, T24N, R5E W.M.
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONCAVE Slope (%): _____
 Subregion (LRR): A Lat: 47.5282 Long: -122.22268 Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

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 _____ No <input checked="" type="checkbox"/> |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? | Yes _____ No <input checked="" type="checkbox"/> | |

Remarks:
 SITE IS LOCATED WITHIN MAINTAINED LANDSCAPE AREA THAT HAS LIKELY BEEN GRADED DURING HISTORIC STREAM CHANNEL MODIFICATIONS

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) |
|--|-----------------------------|-------------------|----------------------|---|
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | 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 = _____ |
| Sapling/Shrub Stratum (Plot size: _____) | 1. _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| Herb Stratum (Plot size: <u>5'R</u>) | 1. <u>Equisetum arvense</u> | <u>50</u> | <u>Y</u> <u>FAC</u> | |
| | 2. <u>Lapsana communis</u> | <u>10</u> | <u>N</u> <u>FACU</u> | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| 11. _____ | _____ | _____ | _____ | |
| <u>60</u> = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | 1. _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>40</u> | | | | |

Remarks: NO NON-PLANTED TREES/SHRUBS ROOTED IN AREA

SOIL

Sampling Point: TP 1

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) | | | | | | | | |
|---|---------------|-----|----------------|---|-------------------|------------------|------------------------|---------|
| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-10" | 10YR 2/2 | 100 | | | | | Gravelly Sandy loam | |
| 11-15" | 10YR 2/1 | 100 | | | | | GSI - some faint redox | |
| 16-18" | 5Y 4/1 | 100 | | | | | sand | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) | | Indicators for Problematic Hydric Soils ³ : | |
|---|---|---|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | | |

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

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

| Wetland Hydrology Indicators: | | |
|--|---|--|
| Primary Indicators (minimum of one required; check all that apply) | Secondary Indicators (2 or more required) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

| Field Observations: | | Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|---|-----------------------|--|
| Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Depth (inches): _____ | |
| Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Depth (inches): _____ | |
| Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Depth (inches): _____ | |

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

Remarks:
 NO WATER IN HOLE - BUT SAND LENSE IS WET

TP # 2 WEST SIDE OF STREAM
(INCLUDED WITHIN OHW OF STREAM)

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 8316 AVALON DR. City/County: MERCER ISLAND Sampling Date: 05/23/17
 Applicant/Owner: PLATON State: WA Sampling Point: TP 2
 Investigator(s): ALTMANN Section, Township, Range: SEC 31, T24N, R5E W.M.
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONCAVE Slope (%): _____
 Subregion (LRR): A Lat: 47.5282 Long: -122.22268 Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

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 _____ No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes _____ No _____ | |
| Wetland Hydrology Present? Yes _____ No _____ | |
| Remarks: <u>SITE IS LOCATED WITHIN MAINTAINED LANDSCAPE AREA THAT HAS LIKELY BEEN GRADED DURING HISTORIC STREAM CHANNEL MODIFICATION</u> | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------|-------------------|------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| _____ = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | OBL species _____ x 1 = _____ |
| 1. _____ | | | | FACW species _____ x 2 = _____ |
| 2. <u>Planted laurel shrubs not included</u> | | | | FAC species _____ x 3 = _____ |
| 3. _____ | | | | FACU species _____ x 4 = _____ |
| 4. _____ | | | | UPL species _____ x 5 = _____ |
| 5. _____ | | | | Column Totals: _____ (A) _____ (B) |
| _____ = Total Cover | | | | Prevalence Index = B/A = _____ |
| Herb Stratum (Plot size: <u>S'R</u>) | | | | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <u>Equisetum arvense</u> | <u>60</u> | <u>Y</u> | <u>FAC</u> | |
| 2. <u>Lapsana communis</u> | <u>10</u> | <u>N</u> | <u>FACU</u> | |
| 3. <u>Epilobium ciliatum</u> | <u>10</u> | <u>N</u> | <u>FACW</u> | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| _____ = Total Cover | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| _____ = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>30</u> | | | | |
| Remarks: | | | | |

SOIL

Sampling Point: TP 2

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

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-7" | 10YR 2/2 | 100 | | | | | Sandy clam loam | |
| 8-14" | 10YR 3/1 | 80 | 10YR 4/3 | 20 | | | Sandy loam | |
| 15-18" | 10YR 2/1 | 100 | | | | | Sandy clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

| | | |
|--|---|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

| | | |
|---|---|--|
| <u>Primary Indicators (minimum of one required; check all that apply)</u> | | <u>Secondary Indicators (2 or more required)</u> |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

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: