SENSITIVE AREAS STUDY

Allison Residence

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SENSITIVE AREAS STUDY

ALLISON RESIDENCE

1 INTRODUCTION

1.1 Background and Purpose

The purpose of this report is to document potential sensitive area impacts associated with the single family residential development project proposed on the currently vacant lot at 16913 28th Ave NE in the City of Lake Forest Park, Washington (Parcel number 4024100475). The site is highly encumbered by a steep slope and a Category 2 wetland with a standard regulatory buffer width of 100 feet. Development of the parcel for single-family use will require a wetland buffer crossing and the reduction of the standard wetland buffer to create a viable building pad along the south edge of the property. (Modifications to the steep slope buffer are also proposed but are addressed under separate documentation)

Under this plan, enhancements and protections are proposed to the retained wetland buffer which will ensure that the wetland functions continue to be adequately protected. Lake Forest Park Municipal Code (LFPMC) 16.16.110 requires compliance with specific sensitive areas study criteria as part of any modification to a sensitive area buffer. This report fulfills these criteria.

1.2 Project Area

1.2.1 Landscape Setting

The subject parcel is located in the McAleer Creek Basin of the Cedar River/Lake Washington Watershed (WRIA 8) in the City of Lake Forest Park (Figure 1). A steep slope occurs along the west end of the property. The rest of the site is fairly flat. A Type 2 stream with a standard 50-foot buffer is located on the adjacent parcel to the north. The subject parcel lies entirely outside of this buffer. A drainage ditch that is not locally regulated as a stream or wetland flows north along 28th Avenue NE toward the Type 2 stream. There are presently no structures on the property.

1.2.2 Parcel history

A prior development proposal was submitted for this property, in conjunction with the property to the north, in 2007. The Watershed Company completed a delineation of the site and prepared a mitigation plan at that time which were

approved by the City of Lake Forest Park, however the development was not constructed. There are presently no structures on the property but some weed removal and mulching have been ongoing. On May 12, 2014 the Watershed Company conducted a site visit to reassess the sensitive areas on-site to ensure the accuracy of previous findings. This report documents the existing conditions on site and proposes enhancement opportunities based on the new site plan and current wetland and buffer conditions.

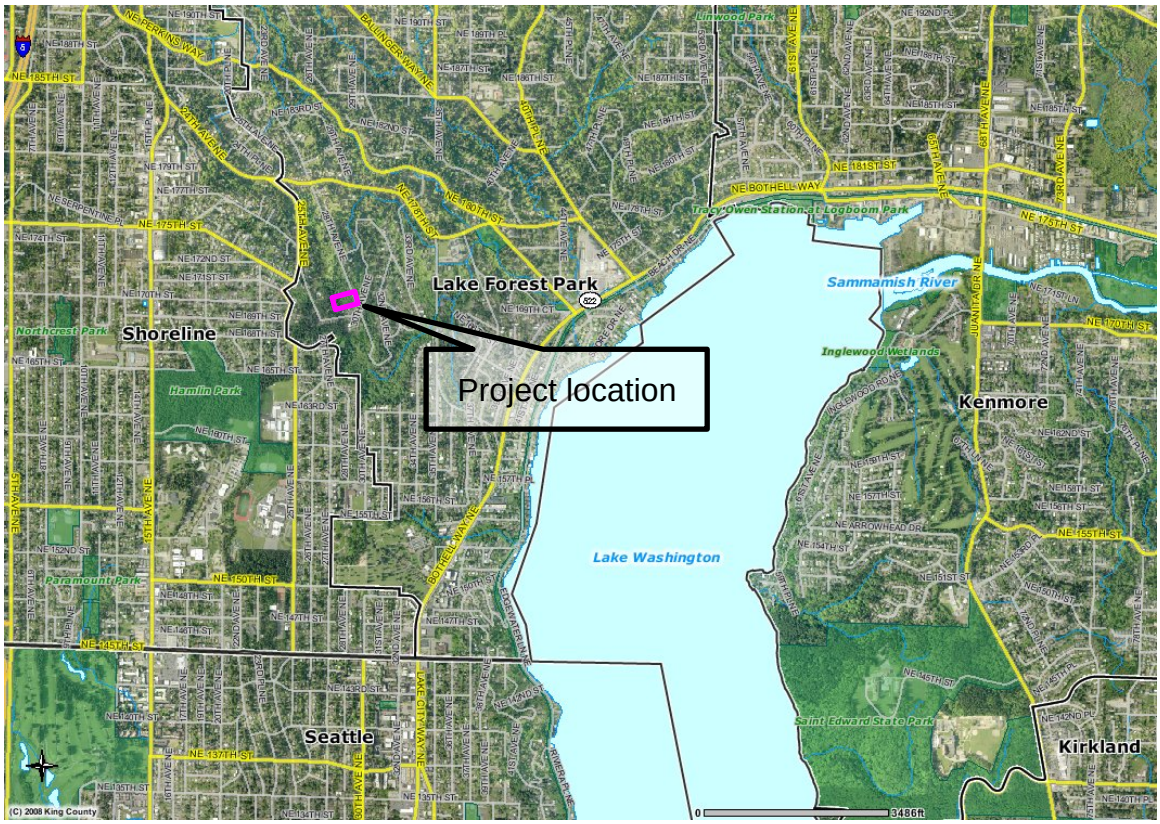


Figure 1. Vicinity Map

1.2.3 Critical Areas

On-site critical areas were assessed and documented in the 2007 *Wetland and Stream Delineation Study* and the *Allison Residence Wetland Buffer Mitigation Plan* prepared by The Watershed Company. Existing conditions were verified during a site visit on May 12, 2014. As documented in the original reports, and verified in 2014, the site includes a large wetland which extends off site to the north. This wetland boundary was flagged and surveyed in 2007. Wetland boundaries were checked during the 2014 site visit, including the collection of new data. No changes to the original wetland boundary or dominant characteristics were observed. The wetland is fully described in the Delineation Study letter included as Appendix B. New data sheets from the 2014 confirmation are included in Appendix B as well.

The wetland is a densely vegetated forested slope wetland that meets the City of Lake Forest Park definition of a Category II wetland. Category II wetlands require a standard buffer width of 100-feet and a minimum buffer width of 70-feet with enhancement.

No streams are present on site. A Type 2 stream with a standard 50-foot buffer is located on the adjacent parcel to the north, however, the subject parcel lies entirely outside of this buffer.

1.2.4 Vegetation

The property is vegetated with red alder-dominated forest and a dense understory of shrubs and ferns. Non-wetland areas are mainly red alder forest with a very dense understory of salmonberry (*Rubus spectabilis*), vine maple (*Acer circinatum*), Pacific dewberry (*Rubus ursinus*), Himalayan blackberry (*Rubus armeniacus*), osoberry (*Oemleria cerasiformis*), and sword fern (*Polystichum munitum*).

Several infestations of nonnative invasive species occur in the wetland buffer. In particular, Himalayan blackberry is densest along the northern boundary of the lot and English ivy threatens several large trees along the base of the steep slope. Holly is scattered throughout the site.

1.2.5 Habitat

Overall, the habitat function of the subject parcel is moderate. The dense vegetation provides refuge for a variety of animals. Large downed woody debris and stumps are abundant. The site is structurally, though not compositionally diverse. Forested, shrub and herbaceous strata are present. The site is part of an undeveloped, forested corridor to the north which provides relatively undisturbed connectivity between a variety of habitat types including upland, wetland and riparian areas throughout the surrounding landscape. However, roads, houses and yards are abundant outside of the relatively small undeveloped area. Residential development is located immediately south of the site and several invasive species are prominent in portions of the site which can reduce accessibility to and sources of food and shelter needed by native wildlife.

The following photographs depict existing conditions on site.

Photo 1 (5/13/14). View from the proposed driveway facing northwest toward the wetland on site and the area where dense buffer plantings are proposed between driveway and wetland.

Photo 2 (5/13/14). Detail of typical condition on site with dominant species including red alder and salmonberry.

Photo 3 (5/13/14). Northwest portion of the site where vegetation is less dense and weedy species and Himalayan blackberry dominate.

Photo 4 (5/13/14). Detail of ivy present through much of the western end of the site.

2 LOCAL REGULATIONS

In the City of Lake Forest Park, wetlands, streams and their respective buffers are afforded protection under Chapter 16.16 of the LFPMC. Applications for a development proposal on a site determined by the planning director to be subject to the requirements of Chapter 16.16 are required to have a sensitive area study completed. According to LFPMC 16.16.110.A, sensitive areas studies should include the following components:

1. *Identify and characterize sensitive area as a part of a larger development proposal site;*
2. *Assess hazards posed by the development proposal to any sensitive areas or sensitive area buffers on or adjacent to the proposed site;*
3. *Propose adequate mitigation, maintenance, monitoring and contingency plans and bonding measures, if necessary;*
4. *Provide a scale map of the development proposal site;*
5. *Provide detailed studies, as required.*

2.1 Wetland Buffer Modifications

16.16.320A specifies standard and minimum wetland buffer widths for each category of wetland. The standard 100 foot wetland buffer for a Category II wetland such as that on site is allowed to be reduced to 70 feet allowed pursuant to 16.16.320E as follows:

E. The planning director may reduce a standard wetland buffer to not less than the minimum buffer as follows:

1. In accordance with an approved sensitive area study, mitigation plan, and the best available science; provided, that a smaller area is adequate to protect the wetland functions based on site-specific characteristics and the proposal will result in a net improvement of wetland and buffer functions.

2. A plan for mitigating buffer-reduction impacts must be prepared that incorporates from the list below incentive-based mitigation to achieve a buffer no less than the minimum buffer listed in subsection A of this section. Whenever the reduced buffer area is degraded, the buffer reduction plan shall provide for revegetation of the degraded area with native plants or other nonnative plants as may be approved by the city and shall provide for a five-year monitoring and maintenance plan. Mitigation options include:

a. Removal of impervious surfaces.

b. Installation of biofiltration/infiltration mechanisms, such as the installation of bioswales, created and/or enhanced wetlands, or ponds.

c. Removal of invasive, nonnative vegetation subject to monitoring (minimum of five years) and continued-removal maintenance of relatively dense stands of invasive, nonnative vegetation from significant portions of the remaining buffer area in conjunction with dense planting of native trees and shrubs or other nonnative plants as may be approved by the city.

d. If not already required under an existing development proposal, installation of oil/water separators for stormwater quality control.

e. Use of pervious material for driveway/road construction.

f. Construction of roofs for on-site buildings built in accordance with the standards of the LEED Green Building Rating System.

g. Removal of significant refuse or sources of toxic material.

h. Revegetation enhancement of degraded buffer outside of the reduced buffer area if the remaining buffer beyond the enhanced buffer reduction area is degraded and a substantial portion of this degraded area is enhanced through revegetation with native plants or other nonnative plants as may be approved by the city subject to a five-year monitoring and maintenance plan.

2.2 Permitted Alterations

Certain alterations to wetlands and/or wetland buffers are permitted pursuant to section 16.16.330. Permitted alterations applicable to this project are described below:

LFPMC 16.16.330A allows the Director to approve modifications to wetlands or wetland buffers as follows:

A. Exceptions to the wetlands requirements may be allowed only if it is determined by the planning director that the development site proposal will enhance or protect the wildlife habitat, natural drainage or other functions and will be consistent with the purposes of this chapter.

1. The applicant shall submit a report prepared by a qualified professional. The report shall assess the habitat, water quality, stormwater detention, groundwater recharge, and erosion protection functions of the buffer; assess the effects of the proposed modification on those functions; and address other criteria listed in this subsection. The report shall include specific recommendations for mitigation including, but not limited to, construction techniques or design, drainage or density specifications.

2. If a wetland is located in a flood hazard area, the applicant shall notify in writing the affected parties and the appropriate responsible officials of the proposed alterations before undertaking any alteration.

3. Introduction of nonnative plant material or wildlife into any wetland or buffer is prohibited unless authorized by a city-approved nonnative plant list or a state or federal permit or approval.

LFPMC 16.16.330G allows the Director to approve wetland crossings as follows:

G. Wetland crossings may be allowed; provided, that the planning director determines that:

1. No possible alternative exists;

2. All crossings minimize impact to the wetland and provide mitigation for unavoidable impacts through restoration, enhancement or replacement of disturbed areas;

3. The overall wetland hydrology is not changed;

4. Important habitat functions are not disturbed;

5. Construction is scheduled during periods of low water tables, generally during the drier summer months. (Ord. 1011 § 1, 2010; Ord. 930 § 2, 2005)

2.2.1 Wetland Buffer Crossing

The driveway is proposed to be located within the inner 50 percent of the Wetland A buffer. LFPMC 16.16.330G. includes provisions for wetland crossings, but does not include a reference to whether the provision is applicable within buffers. Clearly the provision applies to work within and over wetlands. However, the absence of a reference to buffers does not entirely exclude the provision from applying to roadways within buffers since one cannot cross a wetland without first passing through the buffer. Therefore, 16.16.330G clearly applies to instances in which a roadway passes through both a wetland buffer and then over a wetland. Consequently the question becomes – does the same provision apply to crossings/connections within only a wetland buffer and absent an actual wetland crossing?

A logical interpretation to this question involves consideration of the magnitude of an impact. The provision clearly applies to roadways crossing through a buffer and then over a wetland. This involves an impact within interior portions of the buffer, as well as work within close proximity to the wetland and placement of a permanent structure within the wetland. If this provision is

available to such an intrusive and impactful alteration, then surely it should apply to an access road/driveway seeking to only impact the outer wetland buffer. An alternate interpretation would provide a disincentive to minimize critical area impacts. In other words, it would not be consistent with the intended mitigation sequencing portions of the LFPMC that require one to avoid and then minimize impacts before impacting a critical area or buffer. This potential project provides a perfect example of this disincentive. In conceptually locating the driveway, it was placed as far from the wetland as feasible, following the best management practice and local, state and federal regulatory requirements to follow sequencing. However, due to the size and shape of the site and the extent of wetland buffer, the driveway must be situated within the inner half of the wetland buffer. This is the only non-wetland area that meets the road. If this particular code provision was interpreted to not apply within only wetland buffers, then this project could reposition the access road farther to the north so that it directly crosses over the wetland. The argument could be made that the LFPMC prohibited placement away from the wetland (within the buffer) and therefore having the driveway cross over the wetland was the least impacting practical (and permit-able) alternative. As demonstrated by this example, the allowed permitted alterations should not incentivize one to increase the level of impact in order to comply with the provisions. This would not be compatible with the purpose of the Sensitive Areas Chapter as established in LFPMC 16.16.010.

In conclusion, a reading of LFPMC 16.16.330G should include consideration of the intent of the Sensitive Areas Chapter as well as the potential disincentive for limiting impacts that interpretation against use within buffers could provide. Therefore, we hereby request an Administrative Interpretation that allows for the use of LFPMC 16.16.330G in proposing a driveway within the buffer of the wetland on the subject property.

3 PROJECT DESCRIPTION

3.1 Purpose

The applicant seeks to obtain reasonable use of the property by developing a single family residence on-site.

3.2 Proposed Impacts

Creation of a viable development envelope requires the reduction of the standard wetland buffer from 100 to 70 feet. This reduction results in a loss of 3,735 square feet of the standard buffer area (outside of the steep slope and reduced steep slope buffer), but allows the development to be located entirely

outside of the 70-foot reduced (enhanced) buffer and 15′ building setback from buffer edge. Unavoidable impacts will occur only in the buffer; direct impacts to the wetland are avoided completely. The resulting building envelope will be no closer than 81 feet from the wetland edge.

In order to access the development envelope, the driveway must cross the reduced wetland buffer. This is the only non-wetland area that meets the road. The proposed driveway results in 3,180 square feet of buffer impact on-site, and 205 square feet of buffer impact in the right-of-way.

The highest potential for impact will occur where the proposed driveway is located within 8.6 feet of the wetland. Standard gravel roads can impact nearby areas when gravel is sprayed or spread from vehicles or flooding. The proposed project largely avoids these hazards by using a pervious pavement system with cells that prevent gravel from spraying or flooding out. The south edge of the driveway will be placed along the southern property line with a 4′ setback from the property line to keep it as distant from the wetland edge as possible while also allowing room for the installation and maintenance of a joint utility easement. The proposed driveway is a minimal 12 feet in width, and will be constructed of pervious material consisting of flexible cylinders connected on a grid filled with gravel. Each cylinder acts as a cell to hold gravel. Water drains through the gravel and cylinders to infiltrate in the ground below. Materials are designed to withstand much higher loads than will be used on the driveway. The outer 4 feet on each side of the pervious paved driveway will be landscaped with native shrubs, grasses and groundcovers. The cells containing the gravel prevent it from spreading out, and the 4-foot wide landscape strip on either side of the gravel creates a buffer for any gravel that is dislodged. Stormwater will infiltrate fully rather than running off, lessening the chance that floods will loosen gravel. As well, the driveway will only need to support light travel of passenger vehicles at low speed. Infiltration capacity of the proposed driveway exceeds the Lake Forest Park area 100-year storm event rainfall amounts.

The addition of a residence to this lot may cause impacts, as vegetation loss is unavoidable. These impacts may include an increase in floodwater velocity into the wetland, increased sedimentation to the wetland, and a loss of habitat area.

3.3 Mitigation Sequencing

This plan employed mitigation sequencing to achieve the least amount of impact on the natural resource.

Avoidance:

All aspects of home construction, structure placement, and driveway specifications were designed to avoid and minimize unavoidable sensitive area impacts. The total area of the building envelope is limited to approximately 2,229

square feet. Furthermore, the driveway is proposed in the only non-wetland area that meets the road allowing all direct impacts to the wetland itself to be completely avoided.

Minimization:

Unavoidable impacts are minimized by limiting the development to an area of minimal habitat value. Additionally, low impact development techniques will be employed including pervious pavement for the driveway. The driveway was sited to minimize the impact to on-site trees.

Compensation:

As mitigation for the administrative buffer reduction, and the 3,385 square feet of impact associated with the driveway alteration within the wetland buffer, 8,526 square feet of wetland buffer enhancement are proposed. The mitigation plan can be found in Appendix A. The site is currently degraded with several invasive species and is lacking conifer cover. Invasive species removal and conifer under-plantings will allow for functional lift throughout the retained buffer. Following installation, the mitigation area will be maintained and monitored for five years to ensure successful establishment of the wetland and buffer vegetation and the mitigation areas will be protected long term with signs and fencing.

3.4 Impact Assessment / Lift Analysis

As can be seen in Table 1, an increase in on-site native vegetation will result from the proposed project. Proposed native vegetation is intended to improve the overall functions and values of the on-site critical areas. An analysis of the specific functions and values provided by the existing site and the post-project site is provided in Table 2.

Table 1. Functional Lift Analysis

Critical Area/ Buffer Functions	Existing Conditions	Proposed Conditions	Functional Improvement?
Water Quality	The water quality function of the wetland buffer is moderately high. Most of the buffer consists of a dense understory that provides filtering function, however some areas are dominated by weedy invasive species	Install native trees, shrubs and groundcover where cover is lacking after invasive species are removed.	Yes: Soil stabilization through tree and shrub planting is increased. Introduction of rigid vegetation will slow surface water flowing toward the wetland and adjacent stream
Hydrology	The wetland buffer provides moderately high hydrologic function. Dense vegetation in most areas helps slow storm water flowing in the parcel, attenuating flood flow. Areas of primarily deciduous canopy, and less dense native species composition may not help reduce peak flows.	Plant densely in areas that currently lack understory vegetation and add a thick layer of woodchip mulch to help slow storm water flows. Plant conifers.	Yes: Addition of plants and woodchip mulch will help attenuate flood flow during heavy rain events. Large conifer trees hold considerable amounts of rainwater, releasing some slowly and allowing some to evaporate back into the atmosphere. Addition of conifers will provide more flood flow reduction as they mature. Dense buffer plantings adjacent to the proposed pervious driveway will slow runoff and allow stormwater to infiltrate fully.
Habitat	Habitat function is currently moderate. Habitat features are plentiful on-site. The buffer is structurally, though not compositionally diverse. Extensive invasive species are present.	Increase vegetative diversity through addition of conifers. Remove invasive species.	Yes: Increased vegetation structure and native plant cover through planting and invasive species removal will add cover and forage opportunities for wildlife.
Net Condition	Moderate to high function is present overall with good vegetation cover and structure however conifers are lacking and invasive species are abundant.	Invasive species removal, conifer planting throughout retained buffer and dense buffer planting between driveway and wetland	Yes: water quality function increases through native plantings in less dense areas; habitat function improves with added vegetation diversity. Hydrologic function is bolstered with addition of more conifer trees, and invasive species removal.

Overall, the plan represents a lift of the functions and values of the wetland and wetland buffer on site. The proposed impacts are balanced by a high quality mitigation plan that seeks to enhance areas with extensive invasive species currently present. The enhancement plant will also add to the long-term health of the forest community by adding late-term successional conifer species to areas that are currently populated by short-lived, early successional deciduous species such as alder. Dense native plantings in the driveway area will help protect the area of most potential impact. Enhancement will achieve a functional lift in areas that are important for habitat, water quality and hydrology.

Although the development plan will reduce the wetland buffer by 3,735 square feet and require 3,385 square feet of wetland buffer impact, the enhancement of 8,526 square feet will provide an overall lift of functions for the wetland and its buffer.

4 Sensitive Areas Study Criteria

As previously mentioned, modifications to a stream buffer and wetland buffer can be authorized pursuant to an approved sensitive areas study that meets certain criteria. This section is intended to demonstrate compliance with all required criteria.

A. Exceptions to the wetlands requirements may be allowed only if it is determined by the planning director that the development site proposal will enhance or protect the wildlife habitat, natural drainage or other functions and will be consistent with the purposes of this chapter.

1. The applicant shall submit a report prepared by a qualified professional. The report shall assess the habitat, water quality, stormwater detention, groundwater recharge, and erosion protection functions of the buffer; assess the effects of the proposed modification on those functions; and address other criteria listed in this subsection. The report shall include specific recommendations for mitigation including, but not limited to, construction techniques or design, drainage or density specifications.

Section 1 of this report assesses existing conditions. Section 3 discusses the proposed project, potential impacts and provides a lift analysis of the intended post-project functions. Section 5 summarizes the mitigation approach used to compensate for potential impacts and comply with Lake Forest Park sensitive areas code. Appendix A includes the full buffer mitigation plan.

2. If a wetland is located in a flood hazard area, the applicant shall notify in writing the affected parties and the appropriate responsible officials of the proposed alterations before undertaking any alteration.

No flood hazard areas exist on-site.

3. Introduction of nonnative plant material or wildlife into any wetland or buffer is prohibited unless authorized by a city-approved nonnative plant list or a state or federal permit or approval.

Plants selected are all native trees, shrubs and emergent plants appropriate for the landscape setting and hydrogeomorphic position of the site. See Appendix A for a full list of proposed plant species. Non-native plant material currently on-site is proposed for removal as part of the mitigation.

Sensitive area studies shall be in writing and:

1. Identify and characterize sensitive area as a part of a larger development proposal site;

The sensitive areas were delineated and summarized in 2007 in the delineation study included in Appendix B and were re-assessed in 2014 as summarized in this report.

2. Assess hazards posed by the development proposal to any sensitive areas or sensitive area buffers on or adjacent to the proposed site;

Sections 3.2 and 3.4 of this report assess potential impacts to sensitive areas.

3. Propose adequate mitigation, maintenance, monitoring and contingency plans and bonding measures, if necessary;

As compensatory mitigation for the impacts proposed, wetland buffer enhancement plantings and invasive species removal are proposed throughout the entirety of the retained buffer (see Appendix A). A detailed 5-year maintenance and monitoring period is included in the plan to ensure the success of the project. Long-term protection of the mitigation area will be provided by fencing and signage.

4. Provide a scale map of the development proposal site;

See Appendix A.

5. Provide detailed studies, as required.

A Wetland and Stream Delineation Study Letter, updated data sheets are included in Appendix B and C. The Geotechnical study is summarized in a separate report.

5 MITIGATION APPROACH

5.1 Overview

The applicant has followed required mitigation sequencing by avoiding impacts wherever possible, minimizing unavoidable impacts, and compensating for any impacts that may occur. Presented in Appendix A and below is the plan for compensatory mitigation of any potential impacts.

This plan seeks to compensate for potential impacts to the wetland buffer through 8,526 square feet of enhancement and protection of the retained buffer throughout the subject property. The plan consists of three components:

1) Dense plantings where the driveway crosses the wetland buffer and approaches within 8.6 feet of the wetland boundary

2) Invasive species removal throughout the retained buffer and particularly in the locations at the base of the steep slope detailed on the drawings in Appendix A.

3) Native tree, shrub and herbaceous plantings in the areas of invasive species removal and conifer under planting throughout the retained buffer.

In the dense planting area, native trees and shrubs will be installed 9 and 6 feet on-center, respectively (Appendix A, Sheet 3). Groundcover species will fill areas between trees and shrubs to create a continuous physical and visual barrier between the driveway and wetland. The total dense planting area is 1,276 square feet. Under planting is proposed for areas where native vegetation is already established.

The under-planting will increase species diversity as well as density, as the buffer in the in-planting area is presently dominated by a single species in each stratum (red alder in the tree layer and salmonberry in the shrub layer). Species to be planted are shown on Sheet 3 of the Mitigation Plan (Appendix A). They include 4 tree species, 13 shrub species, and 4 groundcovers and perennials. Some substitutions may occur, depending on specific site conditions, but at least three tree species and six shrubs species, and one groundcover species will be

established within the five-year monitoring period. Installation specifications are detailed in Appendix A, Sheet 4.

The English ivy infestation, centered on trees at the base of the steep slope, will be addressed by removing each vine. Himalayan blackberry will be removed and the site will be monitored for new shoots. Holly is less abundant on the site than the other invasive species and each plant will be removed. Removal methods are described on Sheet 4 of Appendix A. The site will be maintained free of invasive species until re-infestation is precluded by dense native species growth. This should be accomplished within five years, considering the health and preponderance of native species and the proposed densities of plants to be installed in the buffer. A maintenance plan for both invasive species control and for the installed plantings is included in Appendix A Sheet 3, and detailed below. The mitigation plantings will be monitored for five years to ensure that the site meets the performance standards.

Appendix A contains the detailed mitigation plan figures. The following are the plan notes:

5.2 Maintenance and Monitoring Plan

A 5-year maintenance and monitoring plan for the buffer enhancement is detailed below.

5.2.1 Goals

1. Increase native species density and diversity between the wetland and the proposed driveway to protect the wetland from potential impacts.
2. Enhance the wetland buffer between the proposed development and wetland to compensate for habitat loss, improve existing habitat, and protect the wetland.
3. Remove non-native invasive species from the wetland buffer and maintain the area free of future infestations.

5.2.2 Performance Standards

The standards listed below will be used to judge the success of the mitigation installation over time. If performance standards are met at the end of Year 5, the site will then be deemed successful.

The standards listed below will be used to judge the success of the plan over time.

1. Survival: Achieve 100% survival of installed plants by the end of Year 1. This standard can be met through plant establishment or through replanting as necessary to achieve the required numbers.

2. Native cover in woody vegetation areas:
   - Achieve 60% cover of native trees and shrubs by Year 3. Volunteer species may count towards this cover standard.
   - Achieve 80% cover of native trees and shrubs by Year 5. Volunteer species may count towards this cover standard.
3. Species diversity: Establish at least 3 native tree species, 6 native shrub species, and 1 native groundcover in the in-planted area by Year 5; establish at least 2 native tree species, 4 native shrub species, and 1 native groundcover in the densely-planted area by year 5. Volunteer species may count towards this standard.
4. Invasive cover: No more than 10% cover by invasive weed species in any year.

5.2.3 Monitoring Methods

Note: specifications for items in **bold** can be found below under "Material Specifications and Definitions."

The installed vegetation will be monitored for five years after initial installation. Within two months of plant installation, an as-built report will be prepared to document the general implementation of the mitigation plan. Any minor changes to the approved mitigation plan that are required by field conditions or plant availability during plan implementation must be documented in the as-built report. The monitoring period begins once the as-built report has been approved by the City of Lake Forest Park. The approved as-built report then becomes the approved mitigation plan for future inspection purposes.

During the as-built inspection, the monitoring **biologist** will install monitoring transects. Approximate transect locations will be marked on the as-built plan. Transects will be established in the planted areas: one in each of the in-planted areas and one in the densely-planted area. Transects will be as long as allowed by each particular planting area, but will cover at least half the length of each planted area. All other planted areas not directly covered by transects will be visually assessed and noted as to how they compare to the performance standards.

Monitoring will take place annually for five years. One additional first-year monitoring visit will be conducted in the first spring subsequent to installation. The spring monitoring visit will record maintenance needs such as weeding, mulching, or plant replacement. Following the spring visit the **biologist** will notify the owner and/or maintenance crews of necessary early growing season maintenance. The regular yearly monitoring visits will take place after the

growing season in the late summer or early fall. For each fall visit, the following will be recorded and reported in an annual report submitted to the City of Lake Forest Park:

- General summary of the spring visit.
- Count of dead plants by species in the planted areas (Year 1 only).
- Counts of dead plants where mortality is significant in any monitoring year.
- Estimate of native tree and shrub cover using the line intercept method along established transects.
- Estimate of non-native, invasive species cover in planted areas.
- Notes or sketches of non-native weed problems in planted areas outside of transects.
- Photographic documentation from fixed reference points and transect ends.
- Intrusions into the planting areas, vandalism or other actions that impair the intended functions of the planted areas.
- Recommendations for maintenance or repair of any portion of the mitigation area.

5.2.4 Contingencies

If there is a significant problem with the restoration areas meeting performance standards, a contingency plan will be developed and implemented. Contingency plans can include, but are not limited to: soil amendment; additional plant installation; and plant substitutions of type, size, quantity, and location.

5.2.5 Maintenance

The site will be maintained for five years following completion of the construction. Note: specifications for items in **bold** can be found above under "Material Specifications and Definitions."

- Replace each plant found dead in the spring monitoring visit during the upcoming fall dormant season (October 15th to March 1st).
- Follow the recommendations noted in the spring monitoring site visit.
- General weeding for all planted areas:

- At least twice-yearly, remove all competing weeds and weed roots from beneath each installed plant and any desirable volunteer vegetation to a distance of 18 inches from the main plant stem. Weeding should occur at least twice during the spring and summer. Frequent weeding will result in lower mortality and lower plant replacement costs.

- More frequent weeding may be necessary, depending on weed conditions that development after plan installation.

- Do not use string trimmers (weed whacker / line trimmer) within the mitigation area.

- Himalayan blackberry maintenance plan:

  - Hand dig the Himalayan blackberry root and dispose of the material off-site. The site should be inspected at least twice yearly for the emergence of blackberry sprouts.

  - Once per year, non-native canes encroaching from outside of the planted area are to be cut back to at least 10 feet from the planted area.

- Remove by hand English ivy vines and roots where it occurs on the ground, and by cutting all vines at the base where trees are affected.

- Remove holly plants by hand, including roots where possible.

- Apply slow release granular **fertilizer** to each installed plant annually in the spring (by June 1) of Years 2 through 5. Do not fertilize plants when inundated or submerged.

- Mulch the weeded areas beneath each plan with **wood chip mulch** as necessary to maintain a 4-inch thick mulch ring and keep down weeds.

5.3 Construction Notes and Sequence

5.3.1 Vegetation Installation Sequence

1. Notify the Biologist after delivery of the plant material but prior to planting. Biologist will inspect and approve plants and determine if and where soil amendments may be needed.

2. Prepare a planting pit for each plant per the planting details.

3. Install plants in the revegetation areas per the planting plan and plant schedule. Field-locate plants to avoid native shrubs and trees.

4. Apply slow-release, granular fertilizer such as OsmocoteTM or equal product to plantings one year after initial planting. Follow manufacturer's instructions for all fertilizer applications. Keep fertilizer in weather-tight containers while on site.

5. Depending on soil conditions, the backfill soil should be amended with 50% vegetable compost.

6. Water individual plants thoroughly per best planting practices immediately after planting to eliminate air pockets and to ensure root to soil contact.

7. Mulch each plant with a circular wood chip mulch ring, four (4) inches thick and extending to the drip-line of the plant OR 12" from the stem of the plant, whichever is greater.

8. Supply a minimum of 2 inches of water per week to all revegetated areas from June 1 through September 30 for the first two years following installation.

9. Survival in a healthy condition is to be guaranteed for all of the planted specimens through their entire first growing season. An acceptance inspection is to be made during the Year 1 monitoring visit following the initial planting and any dead, missing, or unhealthy specimens are to be replaced. Replacement is to occur during the then-upcoming dormant season.

Note: The Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects, shall monitor:

- All site preparation
- Plant material/installation inspection
    - 50% plant installation inspection
    - 100% plant installation inspection

5.3.2 Material Specifications and Definitions

- **Wood chip mulch**: "Arborist chips" (chipped woody material) approximately 1 to 3 inches in maximum dimension (not sawdust or coarse hog fuel). This material is commonly available in large quantities from arborists or tree-pruning companies. It is also sold as "Animal Friendly Hog Fuel" at Pacific Topsoils [(800) 884-7645]. Mulch shall not

contain appreciable quantities of garbage, plastic, metal, soil, and dimensional lumber or construction/demolition debris.

- **Fertilizer**: Slow release, granular fertilizer such as Osmocote™ or equal product. Most retail nurseries carry this product. Follow manufacturer's instructions for application. Keep fertilizer in a weather-tight container while on site. Note that fertilizer is to be applied only in years two, three, four, and five and not in the first year.

- **Compost**: Cedar Grove Compost or equivalent product. 100% vegetable compost with no appreciable quantities of sand, gravel sawdust or other non-organic materials.

- **Biologist**: Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects.

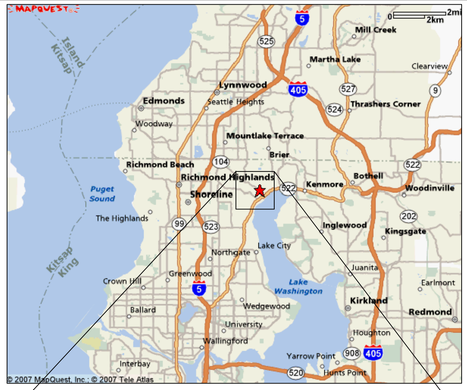
6 SUMMARY

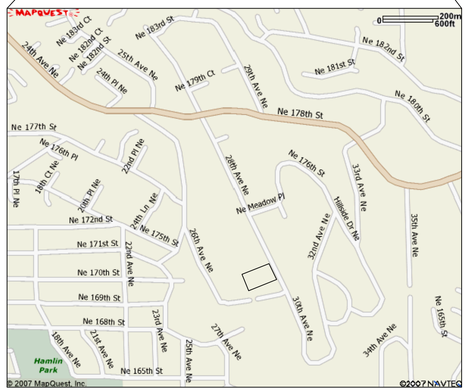
Construction of single family residence is proposed on the subject parcel. Creation of a viable development envelope requires the reduction of a Category II standard wetland buffer from 100 to 70 feet. This reduction results in a loss of 3,735 square feet of the standard buffer area, but allows the development to be located entirely outside of the 70-foot reduced (enhanced) buffer and 15' building setback from buffer edge. Unavoidable impacts will occur only in the buffer. direct impacts to the wetland are avoided completely. The proposed building envelope will be located no closer than 81 feet from the wetland edge. In order to access the development envelope, the driveway must cross the reduced wetland buffer. This is the only non-wetland area that meets the road. The proposed driveway results in 3,385 square feet of buffer impact.

As mitigation for the proposed development extensive invasive species removal, conifer under plantings and dense buffer enhancement plantings are proposed throughout areas of the retained buffer. An overall net gain in critical area buffer functions and values is proposed.

APPENDIX A

Project Plans





LEGAL DESCRIPTION:

(PER KING COUNTY ON-LINE ASSESSOR PROPERTY CHARACTERISTICS REPORT)

LOT 28, BLOCK 23, LAKE FOREST PARK 3RD ADDITION, AS RECORDED UNDER VOLUME 22 OF PLATS AT PAGE 4, RECORDS OF KING COUNTY, WASHINGTON.

BASIS OF BEARING:

THE BASIS OF BEARING FOR THIS SURVEY IS SOUTH 20°54'30" EAST BETWEEN FOUND MONUMENTS ALONG 28TH AVENUE NE AS SHOWN ON THE PLAT OF LAKE FOREST PARK 3RD ADDITION AND THE PLAT OF BIRCH LANE.

VERTICAL DATUM:

THE VERTICAL DATUM FOR THIS SURVEY IS NAVD 88, ESTABLISHED BY GPS OBSERVATIONS BASED ON THE WASHINGTON STATE REFERENCE NETWORK, A REGIONAL COOPERATIVE OF GPS REFERENCE STATIONS.

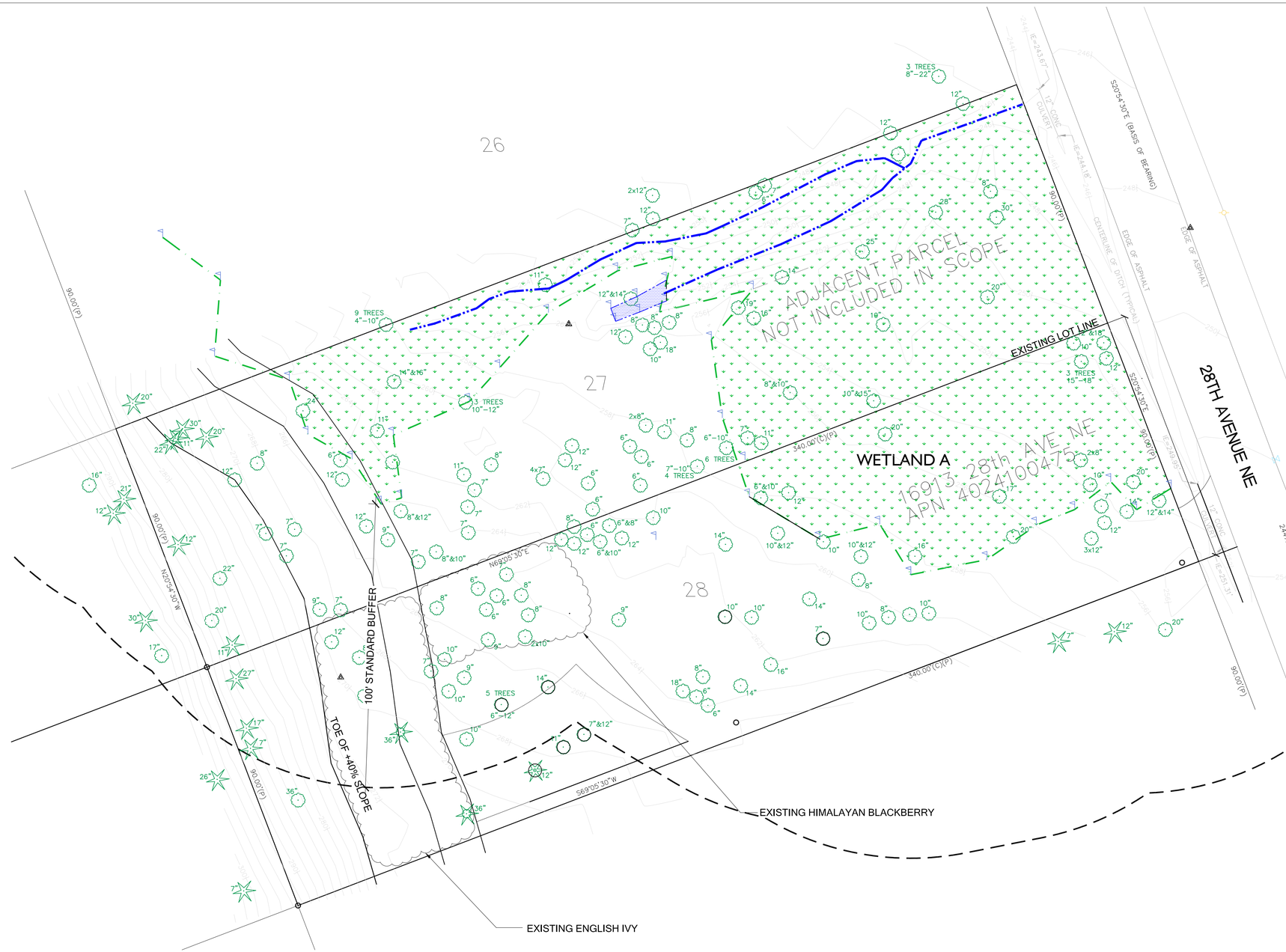
SURVEYORS NOTES:

1. ALL UNDERGROUND UTILITY LOCATIONS ARE BASED ON OBSERVED EVIDENCE OF STRUCTURES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. THE SURVEYOR DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION PROVIDED.

2. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT, WHICH MAY REVEAL RESTRICTIONS AND EASEMENTS OF RECORD. ACCORDINGLY, NONE ARE SHOWN HEREON.

3. THERE ARE NO STRUCTURES OR SEPTIC ON SITE.

4. WETLANDS DELINEATED BY THE WATERSHED COMPANY IN FEBRUARY OF 2007 AND REINSPECTED IN 2014.



EXISTING SITE CONDITIONS

SCALE: 1" = 20'-0"

0 20' 40' 80'

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THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
www.watershedco.com
Science & Design

THE ALLISON RESIDENCE

WETLAND BUFFER MITIGATION PLAN PREPARED FOR BEN & MELISSA ALLISON

PARCEL NO. 402410-0475
LAKE FOREST PARK, WA

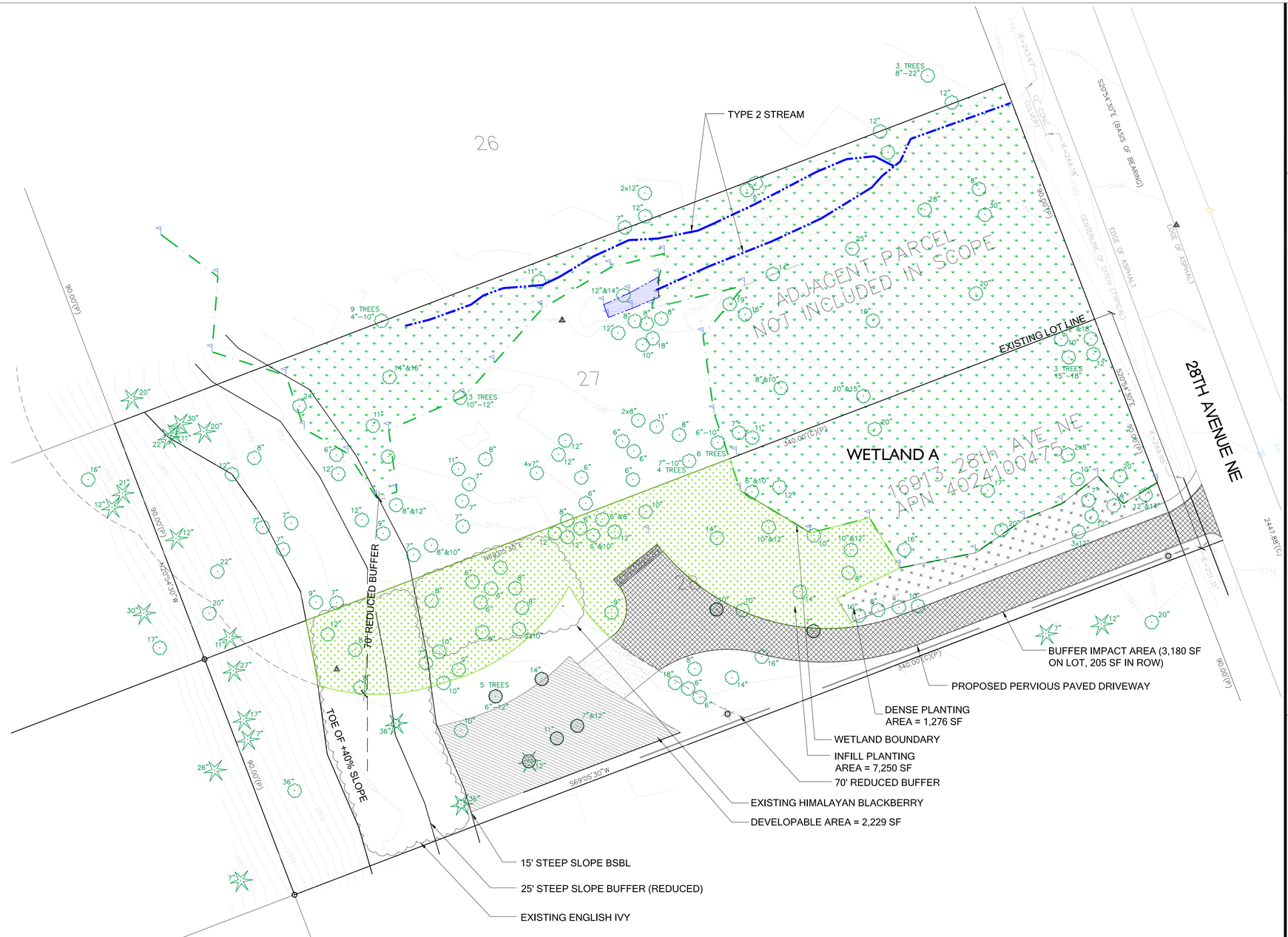
SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	06-05-14	REVIEW SET	MD

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: JMF
DESIGNED: MD
DRAFTED: MD
CHECKED: JMF
JOB NUMBER:
070305
SHEET NUMBER:
1 OF 4

FILENAME: 070305 MITIGATION PLAN 6-3-2014.DWG
PRINTED BY: MIKE DROSKE
DATE: 6/5/2014



PROPOSED SITE PLAN

SCALE: 1" = 20'-0"

0 20' 40' 80'

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070305
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2 OF 4

FILENAME 070305 MITIGATION PLAN 6-3-2014.DWG
PRINTED BY MIKE DROSKE
DATE 6/5/2014

PLANT LEGEND:

TREES

	BOTANICAL NAME / COMMON NAME	QTY.	SIZE / SPACING
AM	ACER MACROPHYLLUM / BIGLEAF MAPLE	3	1 GAL. / 9' O.C.
PM	PSEUDOTSUGA MENZIESII / DOUGLAS FIR	1	2 GAL. / 9' O.C.
T	THUJA PLICATA / WESTERN RED CEDAR	14	2 GAL. / 9' O.C.
TH	TSUGA HETEROPHYLLA / WESTERN HEMLOCK	2	2 GAL. / 9' O.C.

SHRUBS

ac	ACER CIRCINATUM / VINE MAPLE	27	2 GAL. / 6 O.C.
cs	CORNUS SERICEA / RED-OSIER DOGWOOD	4	1 GAL. / 6 O.C.
cc	CORYLUS CORNUTA / BEAKED HAZELNUT	4	1 GAL. / 6 O.C.
li	LONICERA INVOLUCRATA / TWINBERRY	10	1 GAL. / 6 O.C.
rp	RHAMNUS PURSHIANA / CASCARA	14	1 GAL. / 6 O.C.
rb	RIBES BRACTEOSUM / STINK CURRANT	2	1 GAL. / 6 O.C.
rs	RIBES SANGUINEUM / RED-FLOWERING CURRANT	25	1 GAL. / 6 O.C.
rg	ROSA GYMNOCARPA / BALDHIP ROSE	19	1 GAL. / 6 O.C.
sb	RUBUS SPECTABILIS / SALMONBERRY	6	1 GAL. / 6 O.C.
th	RUBUS PARVIFLORUS / THIMBLEBERRY	32	1 GAL. / 6 O.C.
sr	SAMBUCUS RACEMOSA / RED ELDERBERRY	23	1 GAL. / 6 O.C.
sa	SYMPHORICARPOS ALBUS / SNOWBERRY	34	1 GAL. / 6 O.C.
vo	VACCINIUM OVATUM / EVERGREEN HUCKLEBERRY	21	1 GAL. / 6 O.C.

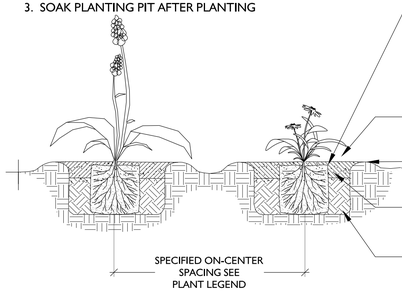
PERENNIALS / GROUNDCOVER

+	ATHYRIUM FILIX-FEMINA / LADY FERN	14	4" POTS
○	GAULTHERIA SHALLON / SALAL	78	1 GAL.
m	MAHONIA NERVOSA / LOW OREGON GRAPE	69	1 GAL.
□	POLYSTICHUM MUNITUM / SWORD FERN	90	4" POTS

A GROUNDCOVERS/PERENNIALS PLANTING DETAIL

NTS

NOTES:
1. PLANTING PIT SHALL NOT BE LESS THAN (2) TIMES THE WIDTH OF THE ROOT BALL DIA.
2. LOOSEN SIDES AND BOTTOMS OF PLANTING PIT
3. SOAK PLANTING PIT AFTER PLANTING



REMOVE FROM POT & ROUGH-UP ROOT BALL BEFORE INSTALLING. UNTANGLE AND STRAIGHTEN CIRCLING ROOTS - PRUNE IF NECESSARY. IF PLANT IS EXCEPTIONALLY ROOT-BOUND, DO NOT PLANT AND RETURN TO NURSERY FOR AN ACCEPTABLE ALTERNATIVE

MIN. 18" DIA. & MIN 4" DEPTH MULCH LAYER (ARBORIST CHIPS PREFERED). HOLD BACK MULCH FROM STEMS

3" MIN HT. WATER BASIN

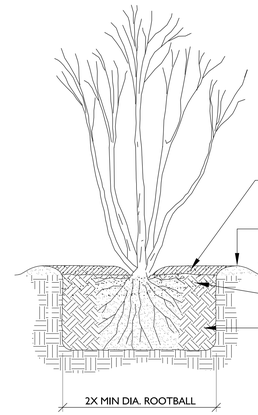
FINISH GRADE

SLOW RELEASE GRANULAR FERTILIZER, OSMOCOTE OR APPROVED EQUIV. APPLIED ONE YEAR AFTER INITIAL PLANTING

REMOVE DEBRIS AND LARGE ROCKS AND BACKFILL WITH NATIVE SOIL. FIRM UP SOIL AROUND PLANT

B TREES/SHRUBS PLANTING DETAIL

NTS



4" MULCH LAYER (ARBORIST CHIPS PREFERRED). HOLD BACK MULCH FROM TRUNK/STEMS

3" MIN HT. WATER BASIN

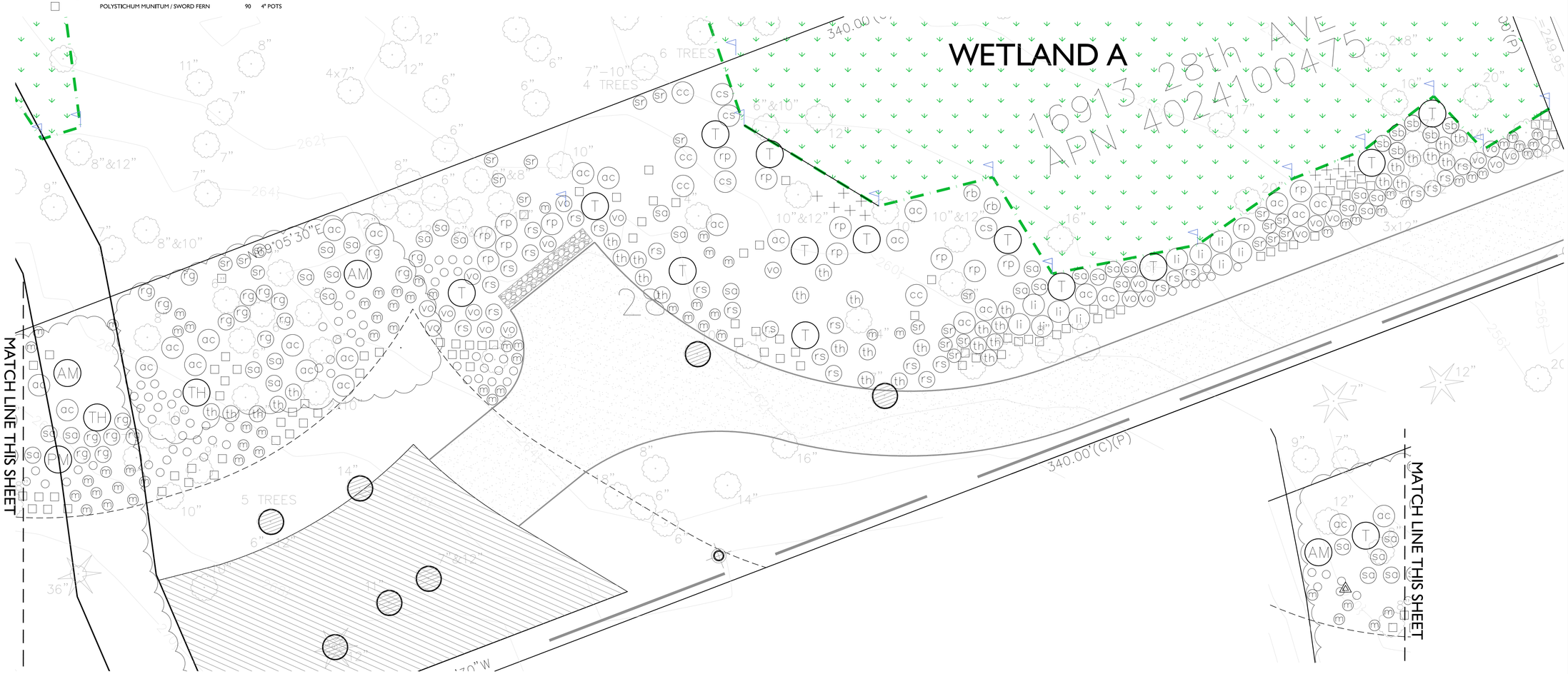
FINISH GRADE

SLOW RELEASE GRANULAR FERTILIZER, OSMOCOTE OR APPROVED EQUIV. APPLIED ONE YEAR AFTER INITIAL PLANTING

REMOVE DEBRIS AND LARGE ROCKS AND BACKFILL WITH NATIVE SOIL. FIRM UP SOIL AROUND PLANT

NOTE: TREES OVER 6'-0" HT. MAY NEED STAKING - VERIFY ON SITE WITH THE CONSULTANT

NOTES:
1. PLANTING PIT SHALL NOT BE LESS THAN (2) TIMES THE WIDTH OF THE ROOT BALL DIA.
2. LOOSEN SIDES AND BOTTOM OF PLANT PIT
3. REMOVE FROM POT & ROUGH-UP ROOT BALL BEFORE INSTALLING. IF PLANT IS EXCEPTIONALLY ROOT-BOUND OR CONTAINS CIRCLING ROOTS, DO NOT PLANT AND RETURN TO NURSERY FOR AN ACCEPTABLE ALTERNATIVE. IF B&B STOCK, REMOVE ALL TWINE/WIRE, & REMOVE BURLAP FROM TOP 1/3RD OF ROOTBALL PRIOR TO PLANTING
4. SOAK PLANTING PIT AFTER PLANTING



MITIGATION PLANTING PLAN

SCALE: 1" = 10'-0"

0 10' 20' 40'

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070305

SHEET NUMBER:
3 OF 4

DATE	PRINTED BY	FILENAME
6/5/2014	MIKE DROSKE	070305 MITIGATION PLAN 6-3-2014.DWG

Executive Summary

This mitigation plan pertains to a proposed single family residence at 16913 28th Ave in the City of Lake Forest Park. The lot is highly encumbered by a large wetland, steep slope and associated buffers. Creation of a viable development envelope requires the reduction of a Category II standard wetland buffer from 100 to 70 feet and a wetland buffer crossing. The applicant has followed required mitigation sequencing by avoiding impacts wherever possible, minimizing unavoidable impacts, and compensating for any impacts that may occur. Presented herein is a plan for mitigation of any potential impacts. Included are a buffer enhancement plan, maintenance and monitoring plan, and installation details.

Buffer impact and compensation

Reduction of the standard wetland buffer from 100 to 70 feet results in a loss of 3,735 square feet of the standard buffer area, but allows the development to be located entirely outside of the 70-foot reduced (enhanced) buffer and 15' building setback from buffer edge. Unavoidable impacts will occur only in the buffer. Direct impacts to the wetland are avoided completely. The proposed building envelope will be located no closer than 81 feet from the wetland edge. In order to access the development envelope, the driveway must cross the reduced wetland buffer. This is the only non-wetland area that meets the road. The proposed driveway results in 3,385 square feet of buffer impact. The highest potential for impact will occur where the proposed driveway is located within 8.6 feet of the wetland. Standard gravel roads can impact nearby areas when gravel is sprayed or spread from vehicles or flooding. The proposed project largely avoids these hazards by using a pervious pavement system with cells that prevent gravel from spraying or flooding out. Additionally, the outer 4 feet on each side of the pervious paved driveway will be planted with native shrubs, grasses and groundcovers. Stormwater will infiltrate fully rather than running off, lessening the chance that floods will loosen gravel.

The addition of a residence to this lot may cause impacts, as vegetation loss is unavoidable. These impacts may include an increase in floodwater velocity into the wetland, increased sedimentation to the wetland, and a loss of habitat area. This plan seeks to compensate for these potential impacts through 8,526 square feet of enhancement and protection of the retained wetland buffer throughout the subject property. The plan consists of three components:

1) Dense plantings where the driveway crosses the wetland buffer and approaches within 8.6 feet of the wetland boundary

2) Invasive species removal throughout the retained buffer and particularly in the locations at the base of the steep slope detailed on the drawings herein

3) Native tree, shrub and herbaceous plantings in the areas of invasive species removal and conifer under planting throughout the retained buffer

The planting areas will be maintained for a minimum of five years, or until they meet the performance standards below.

Goals

- Increase native species density and diversity between the wetland and the proposed driveway to protect the wetland from potential impacts.
- Enhance the wetland buffer between the proposed development and wetland to compensate for habitat loss, improve existing habitat, and protect the wetland.
- Remove non-native invasive species from the wetland buffer and maintain the area free of future infestations.

Performance Standards

The standards listed below will be used to judge the success of the plan over time.

1. Survival: Achieve 100% survival of installed plants by the end of Year 1. This standard can be met through plant establishment or through replanting as necessary to achieve the required numbers.
2. Native cover in woody vegetation areas:
   - Achieve 60% cover of native trees and shrubs by Year 3. Volunteer species may count towards this cover standard.
   - Achieve 80% cover of native trees and shrubs by Year 5. Volunteer species may count towards this cover standard.
3. Species diversity: Establish at least 3 native tree species, 6 native shrub species, and 1 native groundcover in the in-planted area by Year 5; establish at least 2 native tree species, 4 native shrub species, and 1 native groundcover in the densely-planted area by year 5. Volunteer species may count towards this standard.
4. Invasive cover: No more than 10% cover by invasive weed species in any year.

Monitoring Methods

Note: specifications for items in **bold** can be found below under "Material Specifications and Definitions."

The installed vegetation will be monitored for five years after initial installation. Within two months of plant installation, an as-built report will be prepared to document the general implementation of the mitigation plan. Any minor changes to the approved mitigation plan that are required by field conditions or plant availability during plan implementation must be documented in the as-built report. The monitoring period begins once the as-built report has been approved by the City of Lake Forest Park. The approved as-built report then becomes the approved mitigation plan for future inspection purposes.

During the as-built inspection, the monitoring **biologist** will install monitoring transects. Approximate transect locations will be marked on the as-built plan. Transects will be established in the planted areas: one in each of the in-planted areas and one in the densely-planted area. Transects will be as long as allowed by each particular planting area, but will cover at least half the length of each planted area. All other planted areas not directly covered by transects will be visually assessed and noted as to how they compare to the performance standards.

Monitoring will take place annually for five years. One additional first-year monitoring visit will be conducted in the first spring subsequent to installation. The spring monitoring visit will record maintenance needs such as weeding, mulching, or plant replacement. Following the spring visit the **biologist** will notify the owner and/or maintenance crews of necessary early growing season maintenance. The regular yearly monitoring visits will take place after the growing season in the late summer or early fall. For each fall visit, the following will be recorded and reported in an annual report submitted to the City of Lake Forest Park:

- General summary of the spring visit.
- Count of dead plants by species in the planted areas (Year 1 only).
- Counts of dead plants where mortality is significant in any monitoring year.
- Estimate of native tree and shrub cover using the line intercept method along established transects.
- Estimate of non-native, invasive species cover in planted areas.
- Notes or sketches of non-native weed problems in planted areas outside of transects.
- Photographic documentation from fixed reference points and transect ends.
- Intrusions into the planting areas, vandalism or other actions that impair the intended functions of the planted areas.
- Recommendations for maintenance or repair of any portion of the mitigation area.

Contingencies

If there is a significant problem with the restoration areas meeting performance standards, a contingency plan will be developed and implemented. Contingency plans can include, but are not limited to: soil amendment; additional plant installation; and plant substitutions of type, size, quantity, and location.

Maintenance

The site will be maintained for five years following completion of the construction. Note: specifications for items in **bold** can be found above under "Material Specifications and Definitions."

- Replace each plant found dead in the spring monitoring visit during the upcoming fall dormant season (October 15th to March 1st).
- Follow the recommendations noted in the spring monitoring site visit.
- General weeding for all planted areas:
  - At least twice-yearly, remove all competing weeds and weed roots from beneath each installed plant and any desirable volunteer vegetation to a distance of 18 inches from the main plant stem. Weeding should occur at least twice during the spring and summer. Frequent weeding will result in lower mortality and lower plant replacement costs.
  - More frequent weeding may be necessary, depending on weed conditions that development after plan installation.
  - Do not use string trimmers (weed whacker / line trimmer) within the mitigation area.
- Himalayan blackberry maintenance plan:
  - Hand dig the Himalayan blackberry root and dispose of the material off-site. The site should be inspected at least twice yearly for the emergence of blackberry sprouts.
  - Once per year, non-native canes encroaching from outside of the planted area are to be cut back to at least 10 feet from the planted area.
- Remove by hand English ivy vines and roots where it occurs on the ground, and by cutting all vines at the base where trees are affected.
- Remove holly plants by hand, including roots where possible.
- Apply slow release granular **fertilizer** to each installed plant annually in the spring (by June 1) of Years 2 through 5. Do not fertilize plants when inundated or submerged.
- Mulch the weeded areas beneath each plan with **wood chip mulch** as necessary to maintain a 4-inch thick mulch ring and keep down weeds.

Vegetation Installation Sequence

1. Notify the Biologist after delivery of the plant material but prior to planting. Biologist will inspect and approve plants and determine if and where soil amendments may be needed.
2. Prepare a planting pit for each plant per the planting details.
3. Install plants in the revegetation areas per the planting plan and plant schedule. Field-locate plants to avoid native shrubs and trees.
4. Apply slow-release, granular fertilizer such as OsmocoteTM or equal product to plantings one year after initial planting. Follow manufacturer's instructions for all fertilizer applications. Keep fertilizer in weather-tight containers while on site.
5. Depending on soil conditions, the backfill soil should be amended with 50% vegetable compost.
6. Water individual plants thoroughly per best planting practices immediately after planting to eliminate air pockets and to ensure root to soil contact.
7. Mulch each plant with a circular wood chip mulch ring, four (4) inches thick and extending to the drip-line of the plant OR 12" from the stem of the plant, whichever is greater.
8. Supply a minimum of 2 inches of water per week to all revegetated areas from June 1 through September 30 for the first two years following installation.
9. Survival in a healthy condition is to be guaranteed for all of the planted specimens through their entire first growing season. An acceptance inspection is to be made during the Year 1 monitoring visit following the initial planting and any dead, missing, or unhealthy specimens are to be replaced. Replacement is to occur during the then-upcoming dormant season.

Note: The Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects, shall monitor:

- All site preparation
- Plant material/installation inspection
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Material Specifications and Definitions

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- **Compost**: Cedar Grove Compost or equivalent product. 100% vegetable compost with no appreciable quantities of sand, gravel sawdust or other non-organic materials.
- **Biologist**: Watershed Company [(425) 822-5242] personnel, or other persons qualified to evaluate environmental restoration projects.

MITIGATION NOTES

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THE ALLISON RESIDENCE
WETLAND BUFFER MITIGATION PLAN
PREPARED FOR BEN & MELISSA ALLISON

PARCEL NO. 402410-0475
LAKE FOREST PARK, WA

SUBMITTALS & REVISIONS

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SCALE ACCORDINGLY.

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070305
SHEET NUMBER:
4 OF 4

DATE 6/5/2014 | PRINTED BY MIKE DROSKE | FILENAME 070305 MITIGATION PLAN 6-5-2014.DWG

APPENDIX B

Wetland and Stream Delineation Report (2007, with updated 2014 data sheets)

February 14, 2007

Howard Anderson
1831 North Colony Surf Drive
Lilliwaup, WA 98555

Re: Wetland and Stream Delineation Study

Dear Mr. Anderson:

On February 13, 2007, I visited your property located 28th Avenue NE in the City of Lake Forest Park (parcels 4024100470 and 4024100475). The purpose of my visit was to delineate, flag, and rate jurisdictional wetlands and streams located on the property. This letter summarizes my findings. Enclosed please find data forms and a sketch of the property.

Methods

The parcels were screened using methodology from the *Washington State Wetlands Identification and Delineation Manual* (Washington Department of Ecology 1997). Vegetation, soils, and hydrology were examined, and areas meeting the criteria set forth in the manual were determined to be wetland. Wetland boundaries were marked with pink- and black-striped flagging, and data points were marked with yellow- and black-striped flagging. Wetlands were classified according to the Lake Forest Park Municipal Code (LFPMC).

The ordinary high water mark (OHWM) is generally interpreted as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil destruction on terrestrial vegetation, or the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding area. It is usually marked as the lowest limit of perennial vegetation. The legal definition of the OHWM used by the Department of Fish and Wildlife (WDFW) and defined in WAC (220-110-020(57)) is:

> "*Ordinary high water line means the mark on the shores of all waters that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual and so long continued in ordinary years, as to mark upon the soil or vegetation a character distinct from that of the abutting upland: Provided, That in any area where the ordinary high water line cannot be found the ordinary high water line adjoining saltwater shall be the line of mean higher high water and the ordinary high water line adjoining freshwater shall be the elevation of the mean annual flood.*"

The OHWM of on-site streams was marked with blue- and black-striped flagging. Streams were classified according to the LFPMC.

Findings

Wetlands

One large wetland, Wetland A, covers much of the property. It is densely vegetated with red alder, salmonberry, Himalayan blackberry, devil's club, and lady fern. Several elevated hummocks within the wetland support holly and sword fern, but these areas are entirely surrounded by wetland and fully encompassed by regulatory buffer. Wetland A is primarily fed by seeps, several of which provide enough flow to have formed channels. Soils in Wetland A are black (10YR 2/1) sandy loam, changing to mucky loam at the western extent of the wetland, and were saturated or inundated during the site visit. The wetland continues off-site to the north.

Wetland A is a slope wetland with a mild elevation change. Dense, rigid vegetation covers most of its area. It has several depressions within it that hold back small amounts of water which, because of its position in the landscape, might otherwise cause flooding in nearby roads or residences. Its dense vegetation and potential to attenuate stormwater result in high values for water quality and quantity functions.

Vegetation in the wetland is structurally but not compositionally diverse. Water regimes include saturation, seasonal flooding, and seasonally flowing channels. Large downed woody debris and stumps are abundant. The wetland is cut off from any significantly large undeveloped areas by roads, houses, and yards. In general, it provides good habitat within, but its position in a developed landscape detracts from its habitat value. As well, the presence of English ivy, holly, and Himalayan blackberry diminish its habitat value. Overall, Wetland A's value as habitat it moderate.

Streams

Several channels meeting the LFPMC definition of a stream run through Wetland A. Because the regulatory buffer for these streams is less than that of Wetland A (see *Regulatory Implications*, below) and are therefore fully encompassed by wetland buffer on the property, only the portions of streams that occur outside of the wetland were marked. One stream originating at a culvert runs a short distance through non-wetland forest before meeting Wetland A. This section of stream was marked with paired flags denoting the OHWM. Other stream channels within the wetland originate from seeps or sheetflow from the steep hillside on the western portion of the property. Flow was light but steady during my site visit.

Uplands

Uplands on the site are mainly red alder forest with a very dense understory of salmonberry, vine maple, Pacific dewberry, Himalayan blackberry, osoberry, holly, English ivy and sword fern. Soils are dark brown (10YR 3/3) sandy loam and were not saturated at the time of my site visit. There are presently no structures on the property.

Regulatory Implications

The LFPMC categorizes wetlands based on their King County rating (if available), the presence of rare features, size, and the number of wetland classes it contains. Wetland A is not included in the King County Wetland Inventory. It rates a Class 2 wetland per the LFPMC, requiring a 100-foot regulatory buffer and an addition 15-foot building setback in which structures are not permitted. All streams in the City of Lake Forest Park require 25-foot buffers, as well as the 15-foot building setback.

Buffer widths may be modified through buffer averaging provided the total buffer area is not reduced, the buffer area is contiguous, and the resulting buffer is of equal or higher functional value than the standard buffer. The applicant must also show that averaging is necessary to avoid extraordinary hardship. The resulting buffer may not be decreased in any area by more than 50 percent of the standard buffer.

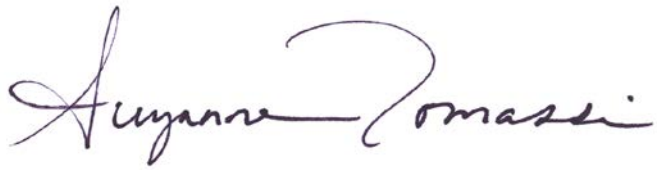
Wetlands are also regulated by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. Any filling of Waters of the State, including wetlands (except isolated wetlands), would likely require notification and permits from the Corps. Federally permitted actions that could affect endangered species (i.e. salmon or bull trout) may also require a biological assessment study and consultation with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service. This includes any in-stream work. Application for Corps permits may also require an individual 401 Water Quality Certification and Coastal Zone Management Consistency determination from Ecology.

Generally, neither the Army Corps of Engineers nor the Department of Ecology regulates wetland or stream buffers.

Please note that the findings of this letter, including the wetland and stream classifications and determination of buffer width, are subject to the verification and agreement of local, State, and federal regulatory authorities.

Please call if you have any questions or if we can provide additional information.

Sincerely,



Suzanne Tomassi
Wetland/Wildlife Biologist

Enclosures

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 1

Project Site:	Lake Forest Park Allison	Sampling Date:	5/13/14
Applicant/Owner:	Ben Allison	Sampling Point:	DP- 1
Investigator:	M. Foster, C. Muters	City/County:	Lake Forest Park/ King
Sect., Township, Range	S 09 T 26N R 04E	State:	WA
Landform (hillslope, terrace, etc)	hillslope	Slope (%)	
Local relief (concave, convex, none)			
Subregion (LRR)	A	Lat	47.75
Long	-122.29	Datum	
Soil Map Unit Name	not mapped	NWI classification	

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil, ☐, or Hydrology ☐ significantly disturbed?
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 this Sampling Point within a Wetland?** ☒ Yes ☐ No
Hydric Soils Present?	☒ Yes	☐ No	
Wetland Hydrology Present?	☒ Yes	☐ No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	75	Y	FAC
2.			
3.			
4.			
	75 = Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. *Rubus spectabilis*	70	Y	FAC
2. *Cornus sericea*	100	Y	FACW
3. *Ilex aquifolium*	20	Y	FACU
4. *Sorbus americana*	10	N	NI
5.			
	100+ = Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. *Equisetum telmateia*	trace	N	FACW
2. *Rubus ursinus*	10	Y	FACU
3. *Dryopteris expansa*	5	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15+ = Total Cover		
Woody Vine Stratum (Plot size)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum
30

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	67	(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

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point – DP-1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-10	**10 YR 2/1**	**100**	**none**				**Loam**	**High organic**
10-14	**10Y 5/1**	**100**	**none**				**sand**	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators 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: **Organics masking redox, very greasy texture**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☒ Yes	☐ No	Depth (in):	**10**
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	**0**

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

THE WATERSHED COMPANY

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 2

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	Lake Forest Park Allison	Sampling Date:	5/13/14
Applicant/Owner:	Ben Allison	Sampling Point:	DP- 2
Investigator:	M. Foster, C. Muters	City/County:	Lake Forest Park/ King
Sect., Township, Range	S 09 T 26N R 04E	State:	WA
Landform (hillslope, terrace, etc)	hillslope	Local relief (concave, convex, none)	
Subregion (LRR)	A	Lat	47.75
Long	-122.29	Datum	
Soil Map Unit Name	not mapped	NWI classification	

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil, ☐, or Hydrology ☐ significantly disturbed?
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 this Sampling Point within a Wetland?** ☐ Yes ☒ No
Hydric Soils Present?	☐ Yes	☒ No	
Wetland Hydrology Present?	☐ Yes	☒ No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	80	Y	FAC
2. *Sorbus americana*	60	Y	NI
3.			
4.			
	100+	= Total Cover	
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. *Sorbus americana*	10	Y	NI
2. *Prunus laurocerasus*	5	Y	NI
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size 1m diam.)			
1. *Athyrium filix-femina*	20	Y	FACW
2. *Polystichum munitum*	20	Y	FACU
3. *Glyceria elata*	20	Y	FACW
4. *Misc. rush*	trace	N	
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60+	= Total Cover	
Woody Vine Stratum (Plot size)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum
30

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	7	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	43	(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

	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: **Vegetation has been recently cleared including significant Himalayan blackberry removal (FACU).**

SOIL

Sampling Point – 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 %	Type[1]	Loc[2]	Texture	Remarks
0--4	**10 YR 2/2**	**100**	**none**				**Loam**	
4-12	**10YR 2/1**	**100**	**none**				**Loam**	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators 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: **Dry and crumbly**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐	Yes	☒	No	Depth (in):
Water Table Present?	☐	Yes	☒	No	Depth (in): **10**
Saturation Present? (includes capillary fringe)	☐	Yes	☒	No	Depth (in): **0**

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: **Dry**